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INNOVATION IN MEDICINE AND HEALTHCARE

ANALYSIS OF INTERCONNECTION OF DETECTION OF TYPE 1 DIABETES AND FTIR SPECTROSCOPY USING MACHINE LEARNING ALGORITHM

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Objectives. Grube et al. 2018 [1] have shown that it is possible to analyze metabolites in individual vibrating cells using Fourier-transform infrared spectroscopy (FTIR). In the presented study investigated whether it is possible to detect a metabolite fingerprint in peripheral mononuclear cells with the FTIR method and, using machine learning (ML) algorithms, to identify interconnection with certain diseases, in current experiment Type 1 diabetes (T1D) was chosen as a disease model. It is one of the most common autoimmune diseases with life-threatening complications. Thus, both its early diagnosis, monitoring and forecasting the development of complications are extremely important.

Materials and Methods. T1D patients and 26 individuals without impaired glucose tolerance participated in the study. Peripheral blood mononuclear cells were isolated from whole blood and frozen at -20°C. FTIR spectra of cell samples were recorded in frequency range of 4000-600 cm⁻¹. Statistical analysis was performed with SPSS Statistics 25.0 program. ML pipeline was built to estimate the possibility to predict T1D based on FTIR spectroscopy data.

Results. Based on preliminary analysis several ML algorithms was tested and “Boosted Decision Tree” chosen as it demonstrated most promising results. ML experiment with chosen algorithm was performed 15 times each time using different random seed yielding an average inverse AUC value is 0.67.

Conclusions. With this experiment, the possibility of a connection between metabolite fingerprint registered in peripheral mononuclear cells and T1D was found. By increasing the number of samples, more accurate correlation scores can be obtained, with the possibility of improving the performance of the algorithm. The next task of the research is to find out whether it is possible to predict the development of diabetic complications using the methods described above.

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1. Grube, M., et al., Analyst, 2018. 143(15): p. 3595-3599.

ANALYSIS OF MACHINE-LEARNING MODELS FOR USING SELF-EVALUATION QUESTIONS TO PREDICT SCORES OF DEPRESSION, ANXIETY AND STRESS IN CARDIOVASCULAR PATIENTS

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Objectives. Nowadays it is well established that psychosocial factors are associated with cardiovascular disease (CVD). Early diagnostic of these risk factors may improve patients' outcome. Machine learning (ML) is one of the most common forms of artificial intelligence, used in healthcare aiming to improve clinical data and treatment results. The aim of the study was to evaluate the ML models' ability to predict scores of depression, anxiety and stress.

Materials and Methods. Cross-sectional study included patients with cardiovascular diseases hospitalized in Riga, Latvia. Patients' depression scores were determined using the PHQ-9 questionnaire, anxiety scores were determined using the HADS questionnaire, and stress scores were determined using the PSS-4 instrument. In addition, patients completed 12 self-assessment questions (sleep, pain, depression, anxiety, etc.). ROC curve analysis was used to determine the single best self-report question. A model that included these 3 self-report questions was created and tested by 7 ML algorithms (linear regression (LR), decision tree (DT), random forest (RF), neural network (NN), support vector machine (SVM), k-fold cross validation (CV), gradient boosting (GB)). A total of 865 patients were enrolled in the study. In order to evaluate ML models and prevent overfitting, patients were divided into 2 subgroups - train and test. The intraclass correlation coefficient (ICC) was calculated as the primary measure of reliability.

Results. The median age of patients was 66 years (IQR 59–73 years). The best agreement of all 7 analysed ML models for depression scores was with CV (ICC = 0.64 (95% CI: 0.55–0.64)), for anxiety scores – SVM (ICC = 0.59 (95% CI: 0.50–0.69)) and for stress scores – RF (ICC = 0.37 (95% CI: 0.26–0.47)).

Conclusions. Prediction of depression scores has the highest accuracy, anxiety scores have lower accuracy, and stress scores have the lowest predictability. There is more to explore about predictive accuracy and potential use of ML techniques in a cardiovascular setting.

ASSESSMENT OF MICROCIRCULATION USING REMOTE PHOTOPLETHYSMOGRAPHY AND AUTOMATED CAPILLARY REFILL TIME IN CRITICALLY ILL PATIENTS

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Objectives. Microcirculation assessment during fluid resuscitation of septic shock is challenging due to lack of objective clinical tests. New methods for evaluation of microcirculation monitoring have been developed—remote photoplethysmography (rPPG) and automated objective capillary refill time measurement technique (aCRT).

The aim: Assess rPPG and aCRT methods as an alternative method for microcirculation evaluation.

Materials and Methods. patients with positive passive leg raising test (PLRT) were initially resuscitated with crystalloid. Patients were divided into 2 groups: COVID-19 (n = 18) and bacterial septic shock (BSS) (n=16). Hemodynamic variables, *manual capillary refill time* (mCRT) and *aCRT parameters* (T90 – time when 90% of capillary refill is over, Tst – time when capillary refill is fully over), peripheral perfusion index (PPI) detected using rPPG were collected before and after PLRT and after volume expansion (VE).

Results. In COVID-19 mean PPI increased during PLRT by 7% (from 43 ± 27 to 46.5 ± 29.1), by 15% after VE (from 43.0 ± 27.8 to 49.5 ± 22.6), while in BSS PPI increased during PLRT by 18% (from 28.3 ± 20.9 to 33.6 ± 25.3), by 28% after VE (from 28.3 ± 20.0 to 36.3 ± 25.8). Mean mCRT in COVID-19 decreased by 22% during PLRT (2.57 ± 0.59 to 1.98 ± 0.68), by 22% after VE (from 2.57 ± 0.59 to 1.98 ± 0.78), while in BSS decreased by 31% during PLRT (from 1.85 ± 0.64 to 1.29 ± 0.38), by 32% after VE (from 1.85 ± 0.64 to 1.26 ± 0.29). Mean aCRT T90 in COVID-19 decreased by 32% during PLRT (from 1.74 ± 1.16 to 1.17 ± 0.79), by 17% after VE (from 1.74 ± 1.16 to 1.45 ± 1.06), while in BSS decreased by 41% during PLRT (from 1.93 ± 1.03 to 1.38 ± 0.79), by 8% after VE (from 1.93 ± 1.03 to 1.78 ± 0.66). Mean Tst in COVID-19 decreased by 21% during PLRT (from 3.33 ± 1.59 to 2.63 ± 1.37), by 10% after VE (from 3.33 ± 1.59 to 3.03 ± 1.44) while in BSS decreased by 25% during PLRT (from 3.74 ± 1.24 to 2.81 ± 1.22) by 2% after VE (from 3.74 ± 1.24 to 3.69 ± 1.12).

Conclusions. This study results shows that rPPG and aCRT are potentially applicable to assess microcirculation in critically ill patients.

AUTOMATED CEPHALOMETRIC LANDMARKS POSITIONING ON VIRTUAL 3D MODELS FOR COMPLEX MAXILLO-FACIAL PRE-SURGERY PLANNING

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Objectives. With the development of 3D-virtual tools for pre-surgical planning, cephalometric analysis must be extended to the three-dimensional domain. However, the 3D cephalometric marking, essential to proper planning, poses difficulties as it is time-consuming and until now, had to be performed manually. Thus, we present a new, user-friendly approach via free web-access pre-surgical planning platform that automatically detects a group of 3D cephalometric landmarks using machine-learning for easier pre-surgical planning.

Materials and Methods. Based on full-head CT-scans of 200 patients, anatomical reference points are marked manually by biomedical engineers. Convolutional Neural Network (CNN) model is developed and trained using structured and validated 3D skull data to achieve full automation of 3D cephalometric landmarking on 3D-virtual models by utilizing directional projections and ray tracing techniques. To optimize the scope of the data allocated for CNN training, patient scans from multiple sources are gathered to closely represent the vast anatomical diversity present in the human population.

Results. The trained network achieves human level performance for the task of cephalometric landmark detection for the vast majority of landmarks, after being tested on a challenging testing set. Additionally, the surgeon can manually adjust the predicted cephalometric landmarks, providing validation of the generated 3D anatomical points, which are then used to iteratively train the network for further improvement of the performance.

Conclusions. Automation of anatomical landmarks determination can accelerate time-consuming pre-surgical planning. However, this type of automated analysis is still challenging in cases of rare and severe pathologies due to large anatomical deviations. To fully replace human annotators for this task, more diverse and validated data is needed to increase the accuracy of the network in dealing with those cases. Ultimately, this network proves that machine learning could ease and fasten the process of pre-surgical planning and make patient-specific solutions more affordable and common.

AUTOMATISATION OF RADIOLOGICAL DATA EXTRACTION PROCESS FROM MEDICAL DATA SYSTEM DATAMED: OPPORTUNITIES FOR SCIENTIFIC REASONS

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Objectives. Develop methodology to automate and accelerate the download process of a large data volume from the medical data system DataMed for scientific reasons, as the current widely used workflow is utterly unoptimized, requiring the operator to perform multiple actions manually ultimately rendering the whole process extremely time consuming and prone to the human factor.

Materials and Methods. The work is based on different open-source components, which are widely available on the Internet: UI.Vision RPA extension for Chromium based web browsers; PeaZip for manipulation with archives from the DataMed system.

Results. The methodology provides benefits in terms of automating the workflow and potentially optimizing time necessary to perform data extraction from the local database system into six stages. At the first stage, the connection to the DataMed server is being established using medical personnel credentials. Second stage: allocation of the data inside the database by importing necessary information for particular subject data allocation from the provided table (the Microsoft Excel software can be used to prepare such a table). The third stage requires a predefined examination type (polytrauma, abdominal, etc.) for the extension to be able to automatically select the desired examination which can be also set up inside the software. The fourth stage is dedicated to the download process of the data in the form of an archive. Then all stages starting from the second one and until the fifth one are being cyclically repeated till the end of the list in the provided table from the second stage. The last sixth step is dedicated to the data extraction from the downloaded archives.

Conclusions. The proposed methodology eases, automatizes the download and post-cleaning process of radiological data from the DataMed database. The exclusion of the human factor makes the data acquisition process more reliable and straightforward, as well as preserves a tremendous amount of time.

BLOOD PURIFICATION USING THE AN69ST (OXIRIS®) HEMOFILTER AS A TREATMENT MODALITY FOR CRITICALLY ILL SEPTIC PATIENT: OVERVIEW OF CLINICAL EXPERIENCE IN PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL IN RIGA, LATVIA

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Objectives. data available so far has shown a hemodynamic stabilisation and improved lactate clearance for a new high-adsorption membrane oXiris® filter. However, the evidence-based use of oXiris® for sepsis is still limited. This study aims to explore the clinical effect of hemadsorption with oXiris® filter in septic shock patients.

Materials and Methods. adult septic shock patients treated with at least one oXiris® set during 2022 were retrospectively analyzed. Those with known chronic kidney failure were excluded. The demographic, clinical, laboratory and survival data were collected from patient's files.

Results. the median age was 65 [IQR 47–73] years. Twenty-one (60%) patients had at least one comorbidity upon hospitalization, predominated by cardiovascular disease in 13 (37%) patients and diabetes in 11 (31%) patients. The median pre-treatment Sequential Organ Failure Assessment (SOFA) Score points were 12 [IQR 10–33]. High vasoactive drug dose (median 0.27 µg/kg/min [IQR 0.13–0.39] and high inflammatory markers (Procalcitonin (PCT); median 26 ng/mL [IQR 11–71] were main indications for initiation of hemadsorption. Abdominal infection [n = 13] was the most common source of sepsis. Gram-negative sepsis was found in 25 (71.4%) patients. The median oXiris® hemofilter initiation treatment time was 19 h [IQR 14–48]. After one oXiris® set, median vasoactive drug dose, blood lactate, PCT levels and SOFA score points decreased by 0.06 µg/kg/min (25%), 0.5 mmol/L (21%), 9.7 ng/mL (37.3%) and 1 point (8.3%) respectively. Twenty-eight-day mortality was 45.7% [n = 16]. In logistic regression analysis only SOFA scale and oXiris® hemofilter treatment initiation time were considered as independent risk factors for 28-day mortality (p < 0.001).

Conclusions. hemadsorption with oXiris® reduce the use of vasoactive drugs, lactate level and SOFA score in septic shock patients. Shorter oXiris® hemofilter treatment initiation time could be potentially associated with better outcome.

BRAIN PERIVASCULAR SPACES IN PATIENTS WITH COGNITIVE IMPAIRMENT

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Objectives. Cerebral perivascular spaces (PVS or Virchow–Robin spaces) are part of the cerebral microvascular structure. The interstitial fluid within the brain drains from the gray matter and flows along with PVS – it works as the lymphatic drainage of the brain and removes waste products such as amyloid- β (A β), which is known to play a role in the pathogenesis of Alzheimer’s disease. Additionally, the presence of PVS is associated with increased A β deposition in the leptomeningeal arteries.

Our goal was to evaluate PVS dilatation in patients with cognitive impairment.

Materials and Methods. In total 57 participants were included and Montreal Cognitive Assessment (MoCA) was done. Patients were divided in 3 groups – 16 participants in the normal cognition (NC) group, 29 in mild cognitive impairment (MCI), and 12 patients in the severe cognitive impairment (SCI) group.

PVS grading was done in basal ganglia and centrum semiovale by the rating scale: *Grade 0* – no PVS dilatation; *Grade 1* – 1 to 10 dilatated PVS; *Grade 2* – 11 to 20 dilatated PVS; *Grade 3* – 21 to 40 dilatated PVS; *Grade 4* – > 40 dilatated PVS.

Results. Basal ganglia PVS Grade 3 and Grade 4 dilatation was encountered more often in patients with severe cognitive impairment, although we did not find statistically significant differences between SCI, MCI, and NC groups.

Centrum semiovale PVS dilatation was encountered more often in patients with SCI. We found statistically significant differences between SCI–MCI groups ($p < 0.05$) and SCI–NC groups ($p < 0.01$).

Conclusions. PVS grading and evaluation could be used as a neuroimaging biomarker for patients with cognitive decline, but further studies are necessary with a larger cohort to determine the use of PVS dilation as a biomarker.

CAN SERUM HER2 AFTER TWO NEOADJUVANT CHEMOTHERAPY CYCLES PREDICT PATHOLOGIC COMPLETE RESPONSE IN PATIENTS WITH HER2 POSITIVE EARLY BREAST CANCER?

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Objectives. Breast cancer (BC) is most prevalent cancer among females. Neoadjuvant systemic treatment (NT) plays a key role in curative treatment of early BC patients, particularly with aggressive subtypes (HER2+; triple-negative). Complete tumour pathologic response (pCR) after NT leads to better DFS and OS, so evaluation of NT efficacy is crucial. Serum HER2 (sHER2) has been proposed as a marker to monitor efficacy of NT in HER2+ BC, as it is available and easy to perform. Still, the evidence about its predictive and prognostic values is sparse.

Materials and Methods. This retrospective, one-centre cohort study enrolled all adult females with non-metastatic BC referred to receive NT in Pauls Stradiņš CUH in 2019–2021. Serum HER2 (sHER2) was measured with hemiluminiscence method in blood serum (cut-off 15 ng/mL) of all study participants before, during and after NT. Further, serum HER2 levels were compared with tumour tissue pathologic response (Miller-Payne stages I-IV) in HER2+ and HER2- BC groups.

Results. Out of 114 patients, 43 (33.7%) were HER2+ and 71 (62.3%) HER2-BC patients. After 2NT cycles, decrease in sHER2 was in a half of HER2+ and 17.0% of HER2- BC cases ($p = 0.000$). Serum HER2 decreased by at least 20% after 2NT cycles in 52.6% of patients with HER2+BC and pCR and only in 5.3% of patients with HER2- tumours and pCR ($p = 0.005$). Average sHER2 decrease in HER2+BC patients after 2NT cycles was 21.8% in pCR and 14.2% in non-pCR groups ($p = 0.518$). Patients with HER2-BC had increase, not decrease in sHER2 levels in both pCR and non-pCR groups.

Conclusions. Serum HER2 decrease by at least 20% after 2NT cycles was associated with more frequent pCR rates in HER2+BC cases, than in HER2-BC cases. Still, despite some tendencies, there was non-significant difference in average decrease of sHER2 after 2NT cycles between pCR and non-pCR groups.

COMPARISON OF MACHINE-LEARNING MODEL WITH HUMAN SUBJECTS TO CORRECTLY IDENTIFY ADVENTITIOUS LUNG SOUNDS

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Objectives.

1. To train machine-learning models & second-year medical students to identify pathological lung sounds.
2. To measure sensitivity, accuracy and specificity of machine-learning model & second-year medical under test conditions.
3. To compare the sensitivity, accuracy and specificity of both study groups.

Materials and Methods. An intervention study of two parallel groups was set up to investigate the sensitivity, specificity and accuracy of the machine-learning model versus human subjects. A total of 45 patient cases & their lung sounds were used in training the machine-learning model (20 hrs) and fifteen second-year medical students (4 days) to recognise pathological lung sounds. Permission was obtained for the study from Kaunas' Regional Bioethics committee (P1-BE-2-57/2021). The lung sounds were recorded in the wards of the LSMU Kaunas Hospital using a Littmann model 3200 electronic stethoscope. All participating parties signed the bioethics agreement forms. Students' training was composed of a lecture about lung sounds and a 3-day virtual training on a study's proprietary website. Both groups' ability to correctly identify pathologies was assessed using a test composed of 9 randomised cases; 6 cases with pathologies and 3 controls. The data was collected and analysed using Jamovi version 2.3.21.

Results. The machine-learning model achieved a median value of 0.667 for specificity, sensitivity and accuracy under test conditions. Whilst students achieved median specificity of 0.667; sensitivity of 0.830; and accuracy of 0.780. The data did not satisfy parametric test criteria; therefore, a Wilcoxon signed-rank test was applied. The analysis showed a statistically significant difference in sensitivity and accuracy between both groups $p = 0.010$ and $p = 0.001$ respectively. The specificity difference between the two groups was statistically insignificant $p = 0.400$.

Conclusions. The pilot research indicates that both groups can be effectively trained using standard audio to identify pathological lung sounds. Medical students showed even higher specificity and sensitivity in identifying adventitious lung sounds compared to our machine-learning model.

COMPARISON OF VIRTUAL REALITY GAME WITH 3D HEADSET AND ONLINE YOGA IN IMPROVING FUNCTIONAL PERFORMANCE, BALANCE AND COGNITIVE FUNCTIONING IN SENIORS – FEASIBILITY STUDY

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Objectives. Objective: Evaluation of the effects of a VR game “Falling diamonds” and online yoga on functional performance, balance and cognition, three attributes linked to falls risk in seniors.

Materials and Methods. A total of 24 physically active participants aged 65–80 years were selected to either the VR game (n = 8), online yoga (n = 8), or control group (n = 8). Static balance, leg strength, and gait speed were measured by the Short Physical Performance Battery, static balance was assessed using the One leg balance test and cognition was evaluated by the RehaCom screening soft-ware at baseline and follow-up at 6 weeks.

Results. The VR game and online yoga within group experienced greater improvements in the summary of Short Physical Performance Battery ($p = 0.016$, $p = 0.011$). The VR game group experienced greater improvements in the One leg balance test on the right leg ($p = 0.028$) more than the online yoga ($p = 0.028$) and control ($p = 0.038$). Online yoga group experienced greater improvements in the Alertness with audio, without audio and Selective attention reaction speed tests ($p = 0.012$, $p = 0.025$, $p = 0.012$) more than the VR game group in the Alertness with audio ($p = 0.003$).

Conclusions. The evaluation and delivery methods of VR game and online yoga are feasible, and trial measures, procedures, and intervention are deemed acceptable by participants. Our findings indicate that using a VR game to exercise could improve functional performance, especially, balance and using online yoga could improve cognition and functional performance in seniors.

COMPUTER VISION-BASED SMARTPHONE APPLICATION FOR ASSESSMENT OF FORWARD HEAD POSTURE IN SITTING POSITION: VALIDITY AND RELIABILITY STUDY

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Objectives. The aim of this study was to assess the test-retest and inter-rater reliability, and the concurrent validity of a smartphone application based on computer vision for the measurement of forward head posture (FHP) in sitting position.

Materials and Methods. A validity and reliability study was carried out. FHP was assessed using a mobile application based on computer vision. To evaluate the test-retest and inter-rater reliability, the FHP was registered four times. During the first day, two assessments were carried out independently by two physical therapists. Seven days later, the FHP was reassessed by the same physical therapists. To investigate the concurrent validity, on the first day a photo of each subject was taken, and a third physical therapist performed the FHP assessment with 2D Kinovea software. All the physical therapists involved in the study remained blinded to the other assessment. This study has been approved by the Ethics Committee of the International University of Catalonia with registration number FIS-2022-010.

Results. Forty-two participants were recruited (26 women and 16 men, with a mean age of 33.33 years \pm 4.59). The FHP in sitting position was $53.07^\circ \pm 6.63^\circ$. An excellent test-retest and inter-rater reliability was found with an Intraclass Correlation Coefficient (ICC) of 0.80 (95% CI [0.66–0.89]) and 0.91 (95% CI [0.85–0.95]), respectively. The standard error of the measurement was 2.95° and the minimum detectable change was 8.20° . The concurrent validity between the Kinovea software and the smartphone application for the FHP in sitting position was very strong $r = 0.95$; $p < 0.001$.

Conclusions. The computer vision-based smartphone application showed excellent test-retest and inter-rater reliability and a very strong concurrent validity for the measurement of FHP in sitting position.

CORRELATION OF PROCALCITONIN AND C-REACTIVE PROTEIN LEVELS: FEATURES IN SIRS

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Objectives. Procalcitonin (PCT) and C-reactive protein (CRP) levels reflect the level of systemic inflammatory response. **Objectives.** Assess the correlation between PCT and CRP in patients with SIRS, septic and in non-septic patients admitted to the Intensive Care Units.

Materials and Methods. We performed a retrospective study that included 60 patients with SIRS. The patients were divided into two groups: septic and non-septic (patients after surgery). Patients with diabetes, autoimmune diseases and patients under 18 years old were excluded. In order to study the correlation between PCT and CRP we assess the markers' value by the time of admission to the intensive care unit, at 24 h of stay, at 48 h and 96 h of admission.

Results. It was determined that all septic patients had elevated levels of PCT and CRP by the time of admission. At the same in post-surgical non-septic patients it was found increased PCT values – in 70% of patients, CRP – in 80% of patients. At the 24 h and 48 h after admission, there was an increase in the value of PCT ($p > 0.05$) and CRP ($p < 0.001$) in septic patients. At 96 h, the decrease of Δ PCT and Δ CRP was determined, being regarded as a marker of adequate treatment ($p < 0.05$). In post-surgical non-septic patients, PCT and CRP were elevated during the first 24 h, with their subsequent decrease by the normal values. In case of evolution in sepsis, a trend of increasing Δ PCT and Δ CRP during the next 48 hours was appreciated.

Conclusions. PCT and CRP were found to be elevated in both septic and non-septic patients (those undergoing laborious surgery). Variations of PCT and CRP are directly proportional and their correlation can be used as an marker of the evolution of SIRS and in the multimodal, including antibacterial, management of the patient.

DAID SMART SOCKS AS FEEDBACK FOR FOOT PERFORMANCE EVALUATION OF FEMALE ATHLETES DURING “SINGLE LEG SQUAT” TEST

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Objectives. Increased pressure on the medial side of the plantar surface of the foot in female athletes, is one of the risk factors for lower extremity injuries. The Functional test such as the “Single leg squat”(SLS) test, is one way to assess foot plantar pressure. Performing functional tests in clinical settings provides subjective feedback, which is a major drawback in all functional tests. The DAid smart socks are an easily applicable objective tool to detect changes in foot plantar surface pressure during simple functional activities. However, there is a lack of information on changes in plantar surface pressure using the DAid smart socks as feedback during functional tests. The study aimed to evaluate the changes in foot plantar pressure of female athletes with the DAid smart socks during the performance of the SLS test.

Materials and Methods. Volunteer female athletes (n = 20) were recruited. The DAid smart socks were used as the assessment tool of the plantar pressure during the SLS test. The evaluation of the change of the plantar pressure of the foot during the SLS test was performed by analysing the variation of the centre of pressure (CoP) and was displayed as 2D colour wave plots.

Results. The values of the plantar surface pressure centre (CoP) of the foot differed statistically significantly during the whole tests for the right foot ($p < 0.00$) and the left foot ($p < 0.00$). In 2D colour wave plots 5., 3., 1. sensor shows the loading of the medial part of the foot. The resulting 2D colour wave plots graphs of changes in relative pressure confirm the conclusions drawn from the CoP results.

Conclusions. For female athletes, during the SLS tests, the distribution of the pressure centre of the plantar surface of the foot is observed in the medial part of the foot, evaluated with the DAid smart socks.

DEEP LEARNING-BASED CLINICAL DECISION SUPPORT SYSTEM AS AN ADD-ON FOR NON-INVASIVE VENTILATION DEVICES

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Objectives. To develop a system for real-time monitoring of OSA, COPD and COVID-19 pneumonia patients. The system should not interfere with the existing NIV system and function as an add-on. The add-on may be used in home care, removing the need for expensive oxygen-rich CPAP or BiLevel devices.

Materials and Methods. The system consists of a custom-designed printed circuit board that reads vital and respiratory parameters (HR, SpO₂, EtCO₂) with 4G and WiFi connectivity that allows transmitting the data to the processing center. The retrospective data was obtained from the 'PhysioNet' database for training machine learning systems, while the prospective clinical database is still being formed during clinical validation.

Results. We have created a patient respiratory monitoring system, capable of real-time detection of status changes on the NIV equipment. Since the existing ventilation system would not be altered, it was possible to achieve the fail-safe operation of such an add-on prototype.

Conclusions. The proposed clinical decision support system for NIV devices has the potential to improve the monitoring of patients' respiratory conditions and provide timely, accurate treatment recommendations for patients on CPAP treatment. Further clinical research is needed to validate the system and assess its effectiveness in clinical settings.

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DETECTION OF AWARENESS IN SURGICAL PATIENTS WITH PATIENT STATE INDEX AND ISOLATED FOREARM TECHNIQUE

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Objectives. The aim of this study was to evaluate the ability of electroencephalogram based Patient State Index (PSI) to assess changes in the level of unconsciousness in patients undergoing intravenous induction with propofol followed by sevoflurane anesthesia. We compared PSI with clinical loss of consciousness defined as loss of isolated hand movements to verbal command.

Materials and Methods. Standard anaesthesia technique was applied for 17 ASA I-III patients by intravenous administration of medication in following order – Fentanyl 1–2 mcg/kg, Propofol 2–3 mg/kg and Atracurium 0.25–0.5 mg/kg. Anesthesia was maintained with sevoflurane 0.8–1.0 MAC and 1–2 mcg/kg/h infusion of Fentanyl. Forearm contralateral to intravenous cannula was isolated for 30 min using arterial tourniquet before each muscle relaxant administration. PSI, isolated hand movement to verbal command, exhaled and inhaled sevoflurane concentration were registered during the induction of anaesthesia, intubation, before, during and after operation and before extubation. Hand movements were defined as specific, non-specific and absence of movement. PSI in the range of 25–50 was considered to indicate optimal hypnotic state for general anesthesia. Presence of intraoperative awareness was assessed using Bruce questionnaire.

Results. After induction of anesthesia and intubation specific hand movements were observed in 41% of patients, 12% showed non-specific hand movements and 47% showed no movement. Before incision specific hand movements were observed in 12% cases. During surgery and immediately after surgery no hand movements were observed. Median PSI after intubation was 34, 31 and 25 in patients who had specific, non-specific and no hand movement ($p = 0.14$). Median PSI before incision was 42 vs 35 in patients with and without hand movement (0.26). No patients reported intraoperative awareness.

Conclusions. There was no significant correlation between PSI indicating adequate hypnosis and absence of movement after induction of anesthesia and before incision. PSI monitoring may not be fully reliable for determining depth of general anesthesia.

DEVELOPMENT OF NATURAL PROTEIN-BASED BIOINKS AS DUAL DRUG DELIVERY SYSTEMS

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Objectives. The objective of this research is to develop multifunctional bioinks with high mechanical strength and biocompatibility suitable for 3D printing of tissues and organs. The bioink encapsulates the medications Dexamthasone and Simvastatin and provides anti-inflammatory effects along with bone regeneration acceleration.

Materials and Methods. In this study, first simvastatin (SIM), a drug that promotes bone regeneration, was encapsulated in the PLGA spheres to ensure a long-term and sustained release of the drug. In the following steps, silk-fibroin was extracted from *Bombyx mori* and used to prepare and synthesize methacrylated silk-fibroin (SFMA), a hydrogel carrier for PLGA-SIM particles. There are two drugs, dexamethasone and simvastatin, which are used as model drugs. The simvastatin is encapsulated in PLGA spheres, while the dexamethasone is directly dispersed in SFMA hydrogels (SFMA-DEX). Followed by crosslinking under the control of a photo-initiator and UV illumination. We examined each hydrogel system using scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FT-IR).

Results. Our work involves optimizing and finalizing the methods for degumming cocoons, extracting, and purifying silk fibroin. This step involved the use of working instructions and protocols for FT-IR, lyophilisation, centrifuges, degumming, extraction, methacrylation, and purification of silk fibroin. Following optimization of the protocol, different concentrations of SFMA were prepared for 3D printing. Based on H-NMR, rheology, gelation time, swelling, degradability and stability in PBS, the physiochemical and mechanical properties of the SFMA were evaluated. The PLGA nanoparticles were used to encapsulate Simvastatin with three different dosages to be incorporated into the SFMA/HAMA composite bioink.

Conclusions. The dual drug delivery systems with the anti-inflammatory and osteogenic drugs promote the bone regeneration without foreign body reaction, and therefore, allows a higher rate of bone regeneration. At the end this composition can be used as promising bioink for 3D printing of the tissue and organs.

EFFECT OF CURCUMIN-LOADED POLYMERIC NANOPARTICLES ON ISCHAEMIA-REPERFUSION (I/R) INJURY IN PRIMARY RAT CARDIOMYOCYTE CULTURE

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Objectives. To determine the effectiveness of PLGA nanoparticles with curcumin (PLGA-curcumin) in preserving primary cardiomyocyte culture viability and functionality after I/R injury.

Materials and Methods. PLGA-curcumin was made by mixing PLGA and curcumin at a ratio of 10:1, transferring to PBS, stirring, sonication, and centrifugation. Obtained pellets were washed, filtered, and evaluated in a Zetasizer. Primary cardiomyocyte cells were isolated from the hearts of 3–5 days-old *Wistar* rats, grown until cardiomyocyte contractions appeared, treated with PLGA-curcumin and subjected to 24h hypoxia (2% oxygen) followed by 24h reoxygenation. Total metabolic activity was measured by PrestoBlue fluorescence. QRS complex contraction time of adrenaline-stimulated cardiomyocytes – by the ImageJ plugin Myocyter (PMID: 31641278). Statistical analysis was performed with SPSS 29.0 software using Student's t-test; $p < 0.05$ was considered significant.

Results. Hypoxia/reoxygenation induced a 37.6% decrease in cardiomyocyte metabolic activity compared to the control ($p < 0.028$). PLGA-curcumin and free curcumin protected cardiomyocytes to a similar extent; the average metabolic activity rise-up from hypoxia/reoxygenation levels in these groups was 14% ($p < 0.012$) and 13% ($p < 0.024$), respectively. QRS peak-time measured at a 10% threshold after hypoxia/reoxygenation with PLGA lower than in hypoxia/reoxygenation samples ($p < 0.043$), and there was no such improvement observed after free curcumin treatment.

Conclusions. PLGA-curcumin protect cardiomyocytes from I/R-induced damage more efficiently than free curcumin: both treatments similarly preserve metabolic activity, but only PLGA-curcumin maintains cardiomyocyte function.

EFFECT OF THREE-DIMENSIONAL PRINTED REPLICA USE IN AUTOTRANSPLANTATION OF AN IMMATURE THIRD MOLAR

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Objectives. Nowadays the three-dimensional printing is used to optimize surgical procedures in dentoalveolar surgery. This study was conducted to evaluate the effectiveness of replicas in immature third molar autotransplantation.

Research protocol was published ISRCTN registry (ISRCTN13563091) BMC Springer Nature. <https://doi.org/10.1186/ISRCTN13563091>

Ethical approval was obtained by the local Ethical Board (RSU, Riga, Latvia).

Materials and Methods. All patients were referred to the Oral and maxillofacial surgery department of the RSU Institute of Stomatology. The study consisted of 46 patients in whom autotransplantation of an immature third molar was performed. The root development of the transplanted teeth was stage 3 in 17 patients, stage 4 in 18 patients and stage 5 in 11 patients according to Moorrees et al 1963

There were 24 patients with three-dimensional printed replica usage in autotransplantation (Study group) and 22 patients conventionally autotransplanted retrospectively analysed (Control group)

Total surgery time, donor tooth extra-alveolar time and the number of donor tooth fitting attempts were monitored.

All procedures were performed in the same department of RSU Institute of Stomatology by one surgeon.

For statistical analysis data were checked for normal distribution tests. The significance level was set at $p < 0.05$. Results are shown as medians or means.

Results. Study Group consisted of 24 patients, (mean age 16.46, range 14–19).

The average total surgery time was 46.67 minutes, donor tooth extra-alveolar time was 52.70 seconds, and the number of fitting attempts was 1.54.

Control Group consisted of 22 patients, (mean age 17.82, range 13–22).

The average total surgery time was 63.87 minutes, donor tooth extra-alveolar time was 67.73 seconds, and the average number of fitting attempts was 2.14.

Conclusions. There was significantly reduced total surgery time and fitting times in patients with replica.

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EFFECTIVENESS OF TELEREHABILITATION PROGRAMME WITH A NOVEL DEVICE FOR TREATMENT OF NECK PAIN: RANDOMISED CONTROLLED TRIAL

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Objectives. The aim of this study was to investigate the effects of a telerehabilitation program based on specific neck exercises (SNE) using a novel device (Spinetrack) on neck disability index (NDI), neck pain, range of movement (ROM), and flexors muscle strength compared to a telerehabilitation program based on SNE and a control group in patients with neck pain (NP).

Materials and Methods. A double blind randomized controlled trial was carried out. Thirty subjects with NP were recruited with 5 to 14 points in the NDI. Patients were randomly divided randomly into 3 groups: Spinetrack group (SG) Exercise group (EG), and control group (CG). Self-perceived disability was measured using NDI, pain intensity with VAS, ROM through FRT using CROM, and flexor muscles strength using chin-test. The measurements were carried out four times, at baseline (T0), after the intervention (T1), at one month follow-up (T2) and at 3 months follow-up (T3). The telerehabilitation program in both groups consisted of SNE, performing 2 weekly sessions for 6 weeks. The study was approved by the CEICA Aragon Ethics Committee, registry number C.P.-C.I. PI 21/357.

Results. Ten patients were included in each group and no sociodemographical or clinical differences were found at baseline between them. A significant group by time interaction was found for NDI ($F = 6.382$; $p < 0.005$), VAS ($F = 9.08$; $p < 0.001$), FRT most restricted side ($F = 13.19$; $p < 0.001$), FRT less restricted side ($F = 8.22$; $p < 0.002$) and chin-test ($F = 4.94$; $p < 0.015$) in favour of the SG.

Conclusions. A telerehabilitation program based on SNE using Spinetrack were more effective than telerehabilitation based on SNE and control group in reducing self-perceived disability and improving pain intensity, FRT to most and less restricted side and chin-test in patients with NP.

EXPERIENCES OF STROKE PATIENTS USING THE DIGITAL REHABILITATION ASSISTANT “VIGO” DURING INPATIENT REHABILITATION

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Objectives. The digital assistant “Vigo” is a computer-generated artificial intelligence-based application that serves as a digital assistant to a stroke patient. With its conversational chatbot and gamification elements it counsels, educates, and trains the stroke patient and patient’s family on stroke, rehabilitation, care, and other related issues.

Materials and Methods. Aim of this study was to explore and describe the stroke patients’ experience using the third version of the digital rehabilitation assistant “Vigo” during inpatient rehabilitation.

In this study was used a qualitative approach to gain depth insight into stroke survivors’ own perceptions and experiences of using digital rehabilitation assistant. Ten persons (18–65 years), who have suffered from stroke (1–12 month after stroke) with motor and/or sensor impairment, without severe cognitive disfunction (MoCA > 18) and have used digital rehabilitation assistant “Vigo” during inpatient rehabilitation at least 8 days, was interviewed by using semi-structured interview to obtain information on the usability of the application. Transcripts of interviews was analysed using inductive approach.

Results. The experience using digital rehabilitation assistant of the study participants was analysed regarding the content of the digital rehabilitation assistant “Vigo” (video, images, audio, text, exercises, rest breaks, chat room, educational opportunities), functionality (device, options, feedback, technical issues), perceptibility, comprehensibility and usage. Users express their opinion regarding of accepting provided therapy by digital rehabilitation assistant and value its offered opportunity to use it at any time and that digital rehabilitation assistant is useful during inpatient rehabilitation.

Conclusions. Persons who have suffered a stroke appreciate the use of the digital rehabilitation assistant “Vigo” in inpatient rehabilitation. According to stroke patients, the digital rehabilitation assistant “Vigo” can be conveniently used in combination with other interventions during inpatient rehabilitation, however, it is necessary to improve the content, design and usability of the application regardless of the user’s functional status.

FETAL BOWEL OBSTRUCTION – CHALLENGE FOR FETAL MEDICINE SPECIALISTS AND VERIFIED OUTCOME

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Objectives. Jejunoileal atresia is a rare type of obstruction of the small bowel affecting newborns. Diagnosis can be challenging and not always identified prior to birth. Prenatal ultrasound has a poor overall accuracy in identifying Jejunoileal atresia prenatally. In addition, the rare colonic form of intestinal atresia can cause symptoms similar to those associated with jejunoileal atresia. In the second trimester, echogenic bowel may be the only finding, while dilated loops of bowel with peristalsis with or without polyhydramnios are findings of the third trimester. We present the case of combined bowel (small and large bowel) atresias in 27years old woman. Gravida 1 para 0 was referred to Riga Maternity hospital for routine ultrasound at 31 weeks of gestation. The 1st trimester screening and the 2nd trimester anomaly scan, as well as antenatal course was uneventful. During examination a slightly dilated bowel loop until 15 mm was depicted. There was no evidence of any additional fetal anomalies. With follow up ultrasound progressive enlargement of the centrally located loop with peristaltic and the absence of polyhydramnios were observed. The perianal complex was clearly visualized, excluding rectum atresia.

The labour was induced at 38⁺¹ weeks. The boy (3245 g) was born vaginally. X-ray exam supposed the jejunoileal obstruction. During explorative laparotomy ileal (IIIB type) and colonic (5 cm from ileocecal angle) atresias were confirmed. Y jejunoileal stoma and end-to-end colonic anastomosis were created. The total length of small bowels was 50 cm.

Prenatal diagnosis of bowel atresia has a positive impact on prognosis; it allows the family to accept the diagnosis, as well as it leads to prompt postnatal management and thus decreasing complications. Genetic counselling is suggested for the couple, as the recurrence risk is increased with jejunoileal (type IIIB) atresia.

FETAL OVARIAN CYST-CHANGING ULTRASOUND APPEARANCE AND UNANSWERED QUESTIONS

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Objectives. Ovarian cysts are the most common intra-abdominal masses in female fetuses, that resolve within the first few months after birth. Rarely fetal ovarian cysts can have complications such as bleeding into the cyst or twisting. Large ovarian cysts can cause polyhydramnios due to compression of the bowel. Surgery may be necessary if there is torsion.

We present case series of fetal ovarian cyst, detected prenatally, with different outcomes.

Case 1. A 34-year-old woman, G 3, P 2, was first referred at 34⁺⁰ weeks due to cystic complex lesion in the female fetal abdomen. On referral complex mass 5.7 × 4.7 cm to the left of the bladder were revealed by ultrasound. During the follow up the size of the tumour enlarged to 65x58 cm, became anechoic. Polyhydramnios, moderate ascites and thick walled intestines without peristaltic was observed. A 2830 g infant was delivered vaginally after induction of labour with APGAR 7/7. But 16 h later after sudden episode of screaming breathing stopped abruptly and newborn became cyanotic, quickly developed desaturation and bradycardia. Only after explorative laparotomy and left adnexectomy due to ovarian torsion neonate's condition improved.

Case 2. A 31-year-old woman, G 3, P3, was referred at 31⁺⁵ weeks for routine 3rd trimester USG. Unilateral, unilocular cyst on the left side of 23X21 mm was confirmed, increased in the size in 2 weeks on follow up, but desapered before labour.

Case 3. A female infant of two month age, presented to the emergency department with vomiting and poor weight gain. Transverse laparotomy was performed and revealed the right ovarion torsion, that was unrecognised antenatally.

The majority of ovarian cysts are benign and resolve spontaneously in the neonatal period. Acute surgical intervention may be needed only in symptomatic infants. Still health providers face challenges for fetal abdominal cysts.

FULL BLOOD COUNT BIOMARKERS FOR PREDICTION OF FLAP COMPLICATIONS IN MICROVASCULAR FLAP SURGERY

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Objectives. Advances in microvascular flap surgery have achieved a significant reduction in flap complications. Despite modern surgical techniques and anaesthetic considerations, the rate of flap loss remains significant. We propose the preoperative risk factor analysis as a tool for prevention of flap loss. Multiple risk factors have been identified yet there is limited data on commonly used laboratory biomarkers for prediction of flap loss. We aim to investigate the link between flap loss and a set of commonly used full blood count biomarkers.

Materials and Methods. This prospective cohort study includes 54 adult patients undergoing elective microvascular flap surgery. The study was conducted with the approval of the Ethics Committee of Riga Stradins University. Preoperative blood draws for analysis of full blood count were collected on the day of surgery before initiation of crystalloid infusion. Postoperative data on subsequent anastomosis revision and flap complications was obtained. Youdens Index was used for selection of cut-off values.

Results. Flap loss with anastomosis revision occurred in 7.4% and other less severe flap complications occurred in 9.2% of cases. Malignancy was the primary indication for surgery in 59.3%, trauma in 13.0% and preceding defects in 27.7% of cases. Patients with flap loss were not different in gender, age, proportion of malignancy, choice of anaesthesia or ASA score from patients without complications. Patients with flap complications had higher preoperative hematocrit (40.8 ± 3.2 vs 36.5 ± 6.0 ; $p = 0.071$) lower lymphocyte count (1.01 ± 0.42 vs 1.66 ± 0.84 ; $p = 0.09$) and lower monocyte count (0.33 ± 0.15 vs 0.55 ± 0.32 ; $p = 0.043$). Binary logistic regression revealed that a lymphocyte count below 1.49 increased odds of free flap loss (OR 9.95; CI95 1.13–87.7; $p = 0.039$).

Conclusions. Our findings indicate that plasma lymphocyte count, monocyte count and hematocrit can be implied as predictive biomarkers for flap complications. Larger studies are needed to elucidate the concept of predictive biomarkers and specific cut-off values for prediction of flap loss.

GENOME INSTABILITY IN AZOOSPERMIC MEN SHOWS ASSOCIATION OF IMPAIRED DNA RECOMBINATION REPAIR WITH POST-TRANSLATIONAL HYPER-SUMOYLATION

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Objectives. Male infertility is a multifactorial pathology accounting for 40–50% of all infertility cases. The recent emergence of next generation sequencing (NGS) offers an opportunity to analyze many genes at once. Gene Set Enrichment Analysis (GSEA) analyzes gene networks sharing common regulation or biological function. There is still a lack of reports on whole exome sequencing (WES) implementation with gene network analysis in male infertility research.

Materials and Methods. WES was performed on 21 non-obstructive azoospermia patients with normal karyotype and excluded Y chromosome microdeletions. A gene set of previously described ($n = 140$)¹ and novel candidate genes ($n = 10$)^{2,3,4,5} of azoospermia was compiled. Samples were sequenced using the Twist Comprehensive Exome Panel and analyzed with the Illumina's Variant Interpreter. P and LP variants were confirmed by Sanger sequencing. Genetic burden test was performed with TRAPD. P value < 0.05 was considered significant. Protein interactions were investigated with ConsensusPathDB, STRING and CytoScape.

Results. Genetic variant burden was elevated in 1473 genes. 302 genes with increased loss-of-function (LoF) variant set were present in more than one sample. Variant burden of genes TKFC, DPM1, UBE2J2, MTCH2, GCLC, NPIP11, OR2T33, POTE1 was elevated in > 50% of samples. Over-representation analysis with pathway based set of genes with high variant burden demonstrated 26 pathways, half of the pathways (13) being involved in spermatogenesis, especially sumoylation (4). Over-representation analysis with protein complex-based sets obtained 14 sets, all involved in DNA repair and genomic integrity. STRING analysis identified two gene clusters: 1) DNA binding/condensation and repair; 2) Ribosome biosynthesis and gene expression processes.

Conclusions. Increased loss of function variant burden and sumoylation may have critical significance in spermatogenesis. Sperm motility impairment is associated with upregulation of sumoylation. These parameters (increased LoF variant burden and the level of sumoylation (SUMO-1)) may be used for focused diagnosis and counselling in non-obstructive azoospermia patients.

HEALTH PROFESSIONALS' DIGITAL COMPETENCIES AND EXPERIENCES WITH USE OF DIGITAL TECHNOLOGY IN REHABILITATION SECTOR

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Objectives. To explore experiences and beliefs of professionals related to the use of digital technology in the rehabilitation sector, as well as self-assessment of their digital competencies.

Materials and Methods. Data was collected in March of 2021 using focus group discussions that included rehabilitation professionals. A qualitative descriptive data analysis approach was implemented using *MaxQDA* software to analyse the acquired data.

Results. A total of 22 rehabilitation professionals whose ages ranged from 23 to 52 years participated in the study. Participants represented eight rehabilitation professions and were employed in 32 different organisations. Technologies mentioned by professionals were described using inductively identified digital technology use case categories, which included technologies used for manufacturing, therapeutical activities, patient assessment, telerehabilitation, patient self-use, patient education, patient monitoring, prescription management, patient data management, work organisation management, professional's communication. Experiences and views, perceived results and challenges, as well as factors related to the use of technology, were described. A description of new competency challenges, professional's skill self-assessments and sources used to acquire relevant knowledge was given.

Conclusions. Considerable number of professionals are encountering the use of various digital technologies, and many had experienced remote service delivery due to the COVID-19 pandemic. Despite the rapid digitalisation of the rehabilitation sector that took place during the past year the regulations for telerehabilitation service delivery are still missing. Further research of new challenges and their impact is required to assist development of a unified rehabilitation sector digitalisation strategy.

INCREASED DNA COPY NUMBER OF LINE-1 AND MSRV TRANSPOSABLE ELEMENTS ASSOCIATION WITH MALE INFERTILITY

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Objectives. Infertility is a common problem, affecting 15% of couples. Male factor is responsible for infertility in approximately 50% of cases, and about 75% of male infertility cases are idiopathic. The current focus is laid on the genetic causes of male infertility, and especially on coding DNA. However, now non-coding DNA is known to also influence gene activity. Retrotransposons are widespread genetic elements that “copy and paste” themselves into different genomic locations. Aim of the study was to analyze two transposable elements Long interspersed nuclear element-1 (LINE-1) and Multiple sclerosis-related retrovirus (MSRV) in males with idiopathic azoospermia and oligozoospermia.

Materials and Methods. Study included 11 men with azoospermia, 34 with oligozoospermia and 34 healthy young man as the control group. Included patients were between 24 and 35 years of age, while in control group between 20 and 25 years of age. DNA extracted from peripheral venous blood was used for quantitative PCR (qPCR) to determine LINE-1 and MSRV DNA copy number determination. Copy numbers were determined based on Ct values of gene of interests and reference gene *RNase P* with two copies per genome.

Results. The major increase (more than a 2-fold) of copy numbers of LINE-1 and MSRV were detected in azoospermic patients ($17\,164 \pm 8\,956$ and 27.54 ± 12.53) in comparison with control group (6423 ± 1571 and 12.40 ± 2.15) ($p = 0.003$ and $p = 0.003$, respectively). Also, about 1.5 times higher copy number compared with a control group was detected in oligozoospermic patients ($9\,479 \pm 8\,737$ and 19.16 ± 16.16 , $p = 0.05$ and $p = 0.02$, respectively). Statistically significant correlation between copy numbers and patient age was not found.

Conclusions. Increased DNA copy numbers of LINE-1 and MSRV could be involved in the pathogenesis of male infertility, especially in the severe cases.

IS MULTIPARAMETRIC ULTRASOUND THE FUTURE OF UNSTABLE CAROTID PLAQUE DIAGNOSTICS?

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Objectives. Evaluate the effectiveness of contrast enhanced ultrasound (CEUS) for detecting carotid plaque instability and neovascularization in reference to Superb Microvascular Imaging (SMI), and histological samples.

Materials and Methods. Incidence of stroke every year increases worldwide, According to World Health Organization In 2020, 1 in 6 deaths from cardiovascular disease was due to stroke, about 87% of all strokes are ischemic strokes, in which blood flow to the brain is impaired and atherosclerotic disease is one of the main causes. In these situations, CEUS and SMI is used to detect neovascularization, as a factor of atherosclerotic plaques instability.

During the prospective research, 88 patients underwent Doppler ultrasound examination, and significant hemodynamic plaques (> 50%) were detected, following SMI and CEUS. The neovascularization was categorized in three categories (Grade 0, Grade 1, Grade 2) and results were compared to histological finding from endarterectomies in 62 patients.

Results. There was a positive correlation between SMI and histological material, $r = 0.319$; $p = 0.01$. Also, positive correlation was found between CEUS and histological material, $r = 0.456$; $p = 0.000$. Moderate positive correlation was observed between CEUS and SMI $r = 0.669$; $p = 0.000$. However, ROC curve analysis showed that SMI is less sensitive than CEUS (51.22% vs 80.56%) Totally CEUS method is valued with the sensitivity – 80.56%, specificity – 77.75%, accuracy – 79.29% with limitation among calcified plaques.

Grade 1 atherosclerotic plaques showed delayed neovascularization (mean time 32 seconds) in comparison to Grade 2 (mean time 19 seconds).

Conclusions. CEUS and SMI as a part of multiparametric ultrasound method shows promising results for carotid plaque instability evaluation than US doppler or microvascular imaging solely and it can be advised in clinical practice for patients with carotid artery soft plaques. Grade 2 plaques show earlier neovascularization than Grade 1 atherosclerotic plaques. However, the sensitivity of CEUS and SMI decreases in markedly calcified plaques.

MIXED CRYOGLOBULINEMIA SYNDROME – FEATURES OF CLINICAL COURSE AND TREATMENT: LITERATURE REVIEW AND DESCRIPTION OF A CLINICAL CASE ASSOCIATED WITH COVID-19

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Objectives. The aim of our work was to report about modern methods of diagnosis and treatment of mixed cryoglobulinemia as a unique systemic inflammatory syndrome, which includes small- and medium-sized vessel vasculitis caused by cryoglobulin-containing immune complexes and potentially caused by hepatitis C virus infection. It may also be associated with autoimmune or lymphoproliferative disorders or, rarely, may be idiopathic.

Materials and Methods. We reviewed the literature regarding modern methods of diagnosis and treatment of mixed cryoglobulinemia and also presented a clinical case of cryoglobulinemia after COVID-19.

Results. Patient M., 34 years old, complained about spotted reddish rashes on the body (mainly limbs), which worsened in the cold period of the year. Treatment was started with NSAIDs, as well as a short course of methylprednisolone 0.5 mg/kg for 10 days. During treatment, positive dynamics were observed (disappearance of rashes, reduction of arthralgias, reduction of ESR, normalization of C-reactive protein level). However, the remission was short-lived and after 2 months it was necessary to conduct a repeat course of immunosuppressive. Considering the refractory course of the disease, the high activity of the inflammatory process, proteinuria, the patient was offered a course of rituximab. After rituximab administration, long-term significant improvements in the clinical picture were not observed. The remission was only during 3 weeks. It was decided to apply an alternative immunosuppressive therapy using cyclosporine A at a dosage of 2.5 mg/kg/day. After 2 weeks of cyclosporine A administration, the clinical picture and laboratory parameters normalization was noted. The patient's dose of cyclosporin A was reduced to maintenance for up to 3 months in order to further induce remission.

Conclusions. Thus, the syndrome of cryoglobulinemia is quite difficult both in diagnosis, taking into account the heterogeneity of clinical and laboratory data, and in treatment and the need to select effective immunosuppressive therapy in different clinical cases.

MULTI-STEP CLINICAL PROTOCOL FOR NOVEL PHARMACOLOGICAL DOSAGE MONITORING DEVICE RESEARCH

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Objectives. A range of tools and methods are currently used to measure patient adherence. However, even after decades of research in this area, there are no unambiguous guidelines on the preferred method of measuring it. Recommendations mostly point to a combination of several methods and tools and call for a tailor-made methodology. This research was aimed to develop a multi-step clinical protocol for novel pharmacological dosage monitoring device research and apply it in daily clinical praxis.

Materials and Methods. A protocol for testing a prototype of an autonomous, portable device for drug usage monitoring was described and subsequently assessed by implementation in clinical research. It was evaluated by the results of the impact of the device use and monitoring activity on the actual adherence measures, disease control measures and preferences of patients and medical staff.

Results. Our protocol divided treatment subjects into three groups – receiving a functional device, a dummy device and a control group. For treatment adherence testing MMAS-8 was used and disease control measurements included ACT test and spirometry. As an important part focus group interviews were performed, which recorded preferences and user experience of patients and medical professionals. A graphic description of our protocol logic was developed, to represent all crucial steps.

Conclusions. We observed that our protocol led to obtaining homogenous and reproducible research data with which valuable and novel insights were achieved. We consider that the success of this protocol is attributable to using a combination of objective and subjective parts and investing time in understanding and respecting real-life patient pathways and motivations.

MULTIPLE SKIN AND MUCOUS MEMBRANES LESIONS IN A MULTIMORBID PATIENT

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Objectives. Patients presenting in the dermatologist's office can have several types of lesions on the skin and also on mucous membranes not mandatory typical for the same skin disease. The multimorbid patient is a challenge for teaching professors in Dermatology to analyze with medical students and residents. To examine a patient – observing the principle "a capitis ad calcem" remains the golden standard. Pathologic signs on the mucous membranes, especially, in the oral cavity are to be consulted by a specialist in oral pathology together with a dermatologist. All the available technologies are to be applied.

Materials and Methods. 6 dermatologists in Clinic for Dermatology and STD, Rīga 1st hospital, and 2 specialists in oral pathology were involved in a study, where data of 312 patients were analyzed according to criteria – patient with multiple skin and mucous membrane lesions of different types, the time necessary for clinical examination, apparatuses assisted diagnostics, typing requests for laboratory and investigations, writing prescriptions for treatments.

Results. Suggestions to prioritize the urgency in diagnostics and treatment were the first criterion not to generate the risk of delay in the waiting list schedule. Respect for time shows a professional attitude to the patient as a client. Professional skills in diagnostics have to be supported by dermoscopy, computer-assisted methods, and lab tests. Histology remains the gold standard in diagnostics, still, it cannot be performed in primary consultation. In the price for visits, the consultation and a few basic tests are included; the advanced methods are costly and not all patients agree to pay for instrumental methods of examination for the higher price.

Conclusions. The cooperation of different specialists of oral pathology together with dermatologist help to avoid mistakes and administration of unnecessary therapy, still it rises costs for patient. The problem of proper time management is more challenging for less experienced specialists.

NANOSTRING SOLUTIONS – APPLICATIONS AND INNOVATION ROADMAP

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Objectives. NanoString Technologies, a leader in spatial biology, offers an ecosystem of innovative discovery and translational research solutions, empowering our customers to map the universe of biology.

Materials and Methods. The GeoMx[®] Digital Spatial Profiler, cited in more than 160 peer-reviewed publications, is a flexible and consistent solution combining the power of whole tissue imaging with gene expression and protein data for spatial whole transcriptomics and proteomics from one FFPE slide. The CosMx[™] Spatial Molecular Imager (SMI) is an FFPE-compatible, single-cell imaging platform powered by spatial multiomics enabling researchers to map single cells in their native environments to extract deep biological insights and novel discoveries from one experiment. The AtoMx[™] Spatial Informatics Platform (SIP) is a cloud-based informatics solution with advanced analytics and global collaboration capabilities, enabling powerful spatial biology insights anytime, anywhere.

Results. Stream image and count files seamlessly from CosMx SMI and GeoMx DSP into AtoMx SIP. Securely store, manage, and collaborate spatial multiomics data around the globe.

Perform secondary analysis and tertiary analysis with preconfigured modules and data analysis pipelines. Edit pre-built modules and pipelines OR build custom modules and pipelines to analyze spatial data to fit your needs.*

Single Sign-On authentication backed by standard-compliant data encryption for data-in-transit and data-at-rest through Amazon Web Services.

Conclusions. The CosMx SMI and AtoMx SIP platforms are expected to launch in 2022. At the foundation of our research tools is our nCounter[®] Analysis System, cited in more than 6,200 peer-reviewed publications, which offers a secure way to easily profile the expression of hundreds of genes, proteins, miRNAs, or copy number variations, simultaneously with high sensitivity and precision.

NEUTROPHIL-TO-LYMPHOCYTE AND LYMPHOCYTE-TO-MONOCYTE RATIOS AS INFLAMMATION MARKERS: LARGE COHORT STUDY

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Objectives. Recent studies (Buonacera 2022, Oh 2022) indicate that blood cell ratios may provide valuable clinical information.

The aim of this research was to study neutrophil to lymphocyte (NTL), neutrophil-to-monocyte (NTM) and lymphocyte-to-monocyte (LTM) ratios and their relation to CRP.

Materials and Methods. 299562 anonymized clinical blood tests (Sysmex XN-9000), performed in 2021 simultaneously with CRP (ARCHITECT i4000SR) at SIA "Centrālā laboratorija" were analyzed by IBM SPSS. Overt leukemias were excluded.

Results. All three ratios correlated with CRP (Spearman, $p < 0.001$) and were different in normal (≤ 5 mg/L) and elevated CRP (Kruskal-Wallis, $p < 0.001$). NTL and LTM in ROC test effectively discriminated elevated CRP (AUC 0.732 and 0.280, respectively, with cutoffs 1.72 and 3.69), being comparable to absolute (0.730) and relative (0.717) neutrophil counts and superior to WBC (0.690). NTM was less informative (0.605) and was not further analyzed.

NTL increased with age, LTM increased till age 3 and decreased afterwards (Kruskal-Wallis $p < 0.001$). Highly significant discrimination of elevated CRP was observed in all age groups.

NTL increased and LTM decreased through the whole range of CRP.

Both NTL and LTM discriminated elevated CRP in decreased, normal and increased WBC and neutrophil settings, this difference was highly significant (Mann-Whitney) in all age groups.

NTL in was slightly higher in men (mean 2.65 vs 2.44) and LTM in women (4.01 vs 3.62), Mann-Whitney $p < 0.001$.

Conclusions. The cohort corresponds to real life practice and is sufficient for representable results.

Both NTL and LTM are easily obtainable and informative. Discrimination of elevated CRP when WBC and neutrophils are normal is of particular interest and may be valuable for screening purposes. Another feature is lineal relationship with CRP with a possibility to evaluate inflammation severity.

Additional research is necessary to evaluate NTL and LTM role in different clinical settings and to specify reference values and cutoffs.

NOVEL RADIONUCLIDES FOR NUCLEAR MEDICINE – CURRENT PERSPECTIVE FROM CLINICAL END USERS' POINT OF VIEW IN EUROPE

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Objectives. Novel radionuclides for nuclear medicine can improve diagnostics of a broad spectrum of diseases. Moreover, achievements in theranostic (therapy + diagnostic) can lead to precision and quick way from diagnosis to treatment. Theranostics is a treatment using diagnostic imaging to identify if target receptors are present on cancer cells, followed by precision radiation treatment that targets these receptors. In order to support the ongoing research across Europe to facilitate access to novel radionuclides, the PRISMAP consortium (European medical radionuclides programme) was established to offer the broadest catalog of innovative radionuclides for medical research.

Materials and Methods. A consortium questionnaire was created and disseminated through the PRISMAP community, professional associations of radiology and nuclear medicine and preclinical/clinical end users in Europe. The current status and needs of clinical end-users in nuclear medicine were identified.

Results. A total of 40 preclinical/clinical users institutions took part in the survey (55% clinical hospitals, 25% research institution-hospital collaborations, 10% preclinical research institutions, 2.5% private clinics and 7.5% - other types). Respondents were from 22 countries.

All respondents performed studies in oncology(100%), while inflammation studies were reported from 80% of respondents, cardiology – 77.5% respondents, neurology – 75% respondents. A similar scene was seen about studies which respondent's facility plan to implement within the next 2–5 years.

Clinical end users currently use the following non-conventional radionuclides in their studies: ¹⁷⁷Lu(80%), ⁶⁸Ga(72.5%), ¹¹¹In(57.5%), ⁹⁰Y(52.5%), other alpha emitters(42.5%), ²²⁵Ac(20%), ⁶⁴Cu(15%) and Terbium isotopes(10%). Radionuclides that would be of interest for use within the next 2–5 years are ⁶⁴Cu(50%), Terbium radionuclide “family” (37%) and alpha emitters, such as ²²⁵Ac(67%) which is widely used both in diagnostics and radionuclide therapy.

Conclusions. The current perspective shows that nuclear medicine specialists/radiologists from broad parts of Europe are interested not only in new radionuclides for diagnostics, but also in therapy and technology advancements that confirm their interest in development.

PATIENT WAITING TIME IN LATVIAN PSYCHIATRIC OUTPATIENT CARE: PROTOCOL AND FUTURE IMPLEMENTATION

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Objectives. The aim of medical triage systems is to classify patients medical needs to identify those that are the most life-threatening and to estimate the optimal waiting time for the first medical intervention. Patient flow without triage frequently is organized in ineffective ways and has a negative influence on patients, medical staff and on the mental healthcare process in general. An effective and highly precise patient flow organization system decreases the waiting time for patients to receive focused and specific treatment, increases patient satisfaction with treatment, increases patient safety, as well as decreases burnout of medical staff. As the new mental health strategy in Latvia is implemented, a top priority of which is to develop more effective and qualitative outpatient treatment services, there is need for creating and implementing triage systems in psychiatric outpatient healthcare to shorten the waiting lines and offer more focused treatment.

Materials and Methods. The first research phase would be to collect the data from outpatient medical records, follow the individual cases from the time point when the first appointment has been made to the point of the outpatient consult. A wide spectrum of sociodemographic and clinical factors, as well as negative health events happening during the waiting time will be assessed and evaluated. The research second phase will include designing the algorithm to include artificial intelligence (AI) solutions for developing the triage system. The practical work for the first phase is planned to start in March 2023, the second phase in August 2023.

Results. The result section is not available yet.

Conclusions. As there is growing demand for mental healthcare, but the resources remain limited, there is a critical need for new and contemporary solutions, including AI, to provide the access, availability, highly precise and focused treatment in the outpatient mental healthcare service.

PHANTOM PAIN MANAGEMENT AND CREATION OF SENSORY PHANTOM MAP OF HAND USING VIRTUAL REALITY ROBOTIC SYSTEM

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Objectives. Phantom limb pain and phantom sensation is recognised phenomenon in amputees and can affect people with brachial plexus injury (BPI). Many of them experience phantom limb sensation, and referred sensation map of damaged [missing] extremity. This experimental trial proposes the use of Robotic assisted Virtual Reality (VR) system to explore possibility of treating complex pain and enhancing sensory phantom map with future intent to use it as interface for robotic prosthesis sensory feedback.

Materials and Methods. Three participants received Robotic assisted VR therapy for pain and creation of phantom sensory map. The VR exercises consisted of tabletop games. In VR stimulation they observed their [missing] fingers being stroked with brush virtually while simultaneously being stroked with a brush in chosen area of phantom map in upper arm. The sessions consisted of 9 two hours long VR exercises in 3-week period. One BPI patient was trans-radial amputee, two BPI patients had non-functioning lower trunk of brachial plexus. Two participants had spontaneous referred phantom map, one had no referred sensation. Pain was evaluated using McGill questionnaire, sensation was evaluated subjectively with patient blindfolded.

Results. Participant 1 reported 50% improvement in pain score (3 Participants 2 and 3 reached 33–50% reduction in pain score (4 and 3 Participant 1 and 3 developed improved recognition of phantom thumb up to 88% and 90% respectively. In 3- and 6-week returned to baseline. Participant 2 did not develop reliable phantom finger map.

Conclusions. The use of Robotic assisted VR system shows positive results in pain management in individuals with BPI. There is evidence of augmenting existing phantom sensory maps in continuous stimulation. Phantom map recognition diminishes when not stimulated. No effect in creating sensory map if no pre-existing spontaneous phantom map present.

PLACENTAL VOLUME OF THE FIRST TRIMESTER AND PREGNANCY OUTCOMES

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Objectives. Identify correlations between placental volume in the 1st trimester and pregnancy outcomes. Compare the intraobserver agreement in the measurements of placental volume.

Materials and Methods. This prospective cohort study was undertaken at the Prenatal Diagnostic Clinic of the Riga Maternity Hospital between January 2021 and May 2022. Unselected Women with singleton pregnancies presenting for the first trimester screening between 11 and 13 weeks were included.

All scans were carried out by a specialist and saved for offline evaluation. All ultrasound examinations were performed by abdominal ultrasonography.

The Virtual Organ Computer-aided Analysis technique was used to analyze all stored volumes off-line by one ultrasound specialist and 6th year medicine student.

Normal placental volume was considered if between 10th and 90th percentiles.

Information regarding the delivery details was collected from the maternity hospital databases.

Statistical analysis involved descriptive statistics and inferential statistics. The significance level to reject the null hypothesis was fixed as $p \leq 0.05$.

Results. This study included 123 pregnant women.

Pregnancies associated with placental volume above the 90th percentile showed a statistically significant proportion with large for gestational age fetuses, $p = 0.009$.

Women with placental volume in the first trimester was above the 90th percentile showed a borderline significant proportion with macrosomia cases, $p = 0.049$.

Women, which placental volume in the first trimester was below the 10th percentile had the newborn with statistically significant lower birthweight, $p = 0.003$.

Inter-observer agreement shows the interclass correlation of 0.894 (good agreement).

Conclusions. This study found the association between placental volume above 90th percentile and macrosomia and large gestational fetuses. Placental volume below 10th percentile resulted in lower birthweight. However measurements for placental volume in the first trimester were not sufficient to establish a great association with fetal growth restriction or preeclampsia

PREDICTION OF SEPSIS USING MACHINE LEARNING METHODS ON MIMIC-III DATABASE

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Objectives. This study aimed to employ machine learning algorithms to facilitate the process of early detection of sepsis and early initiation of treatment for reducing the mortality rate and lowering the economic impact of the disease on the healthcare system.

Materials and Methods. A publicly available clinical dataset, Mimic-III, was used for experimental process. It consists of deidentified patient data collected from the “Beth Israel Deaconess Medical Center” between 2001 and 2012. It contains clinical records of 46 520 patients associated with 58 976 hospital admissions. For training the models, two different feature sets, namely, ‘Flattened Features’ and ‘Max. Divergent’ were generated. During the experimental process, Logistic Regression, Random Forest and XGBoost machine learning algorithms, and two feature sets were employed to train a total of 6 models. Several metrics were used for the evaluation of experimental results.

Results. According to the results analyzed from performance metrics, it can be declared that the model with the flattened features achieved higher scores than the corresponding max. divergent feature model. XGBoost algorithm delivers better results at most of the evaluation parameters, as compared to other ML algorithms. It should also be noted that while the models had generally high sensitivity values, the precision of the models were very low. Different ways of labeling the sepsis patients in the dataset, instead of relying on the ICD-9 codes could potentially reduce the number of false positives

Conclusions. In this study, we trained a total of 6 models using the first 24 hours of intensive care unit data from the MIMIC-III database and successfully applied these models to predict Sepsis in advance. It is presented that the XGBoost algorithm achieved the best results in most cases. It is also observed that the models that were trained on the 24 hours of flattened feature vectors achieved better results.

RADICAL RECONSTRUCTIVE ROTATIONPLASTY TREATMENT FOR PAEDIATRIC FEMORAL OSTEOSARCOMA: CASE REPORT SERIES FROM SINGLE CENTRE EXPERIENCE, 2018–2020

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Objectives. Introduction: Osteosarcoma is the primary skeletal sarcoma (30–80%) with a high malignancy risk (15–20% of all cases), and an average incidence of 10–30 years of age.^{1,2,3} This report evaluates the surgical innovative technique of rotationplasty in the treatment of pediatric femoral osteosarcoma in Riga, Latvia.

Materials and Methods

Cases:

Nr. 1: A 13-year-old girl presented with distal femur osteosarcoma that had metastasized to the proximal femur. Limb sparing radical treatment was warranted and consisted of tumor extirpation with complete femur and thigh anterior muscle group resection, Chopart amputation, crural rotationplasty, and *neo articulatio coxae* formation utilizing the calcaneus and acetabulum. The limb is supplied by *n.tibialis* and *n.peroneus* and within a month, the patient could perform calf muscle controlled movements – abduction, adduction, extension, and contralateral flexion.

Nr. 2: A 12-year-old girl developed osteoblastic osteosarcoma in the distal femur. Van Nes rotationplasty was utilized and consisted of block tumor resection with the musculocutaneous tissues and a 10cm border. *A. et v. poplitea*, *n.tibialis*, and *n.peroneus* were all dissected and preserved. To assure proper length with the opposite leg, the fibular head and five centimeters of the proximal tibia were resected. The talocrural joint is rotated 180 degrees and aligned with the opposite leg's knee joint. Tibial and femoral osteosynthesis was realized with a locking plate.

Results. The patients both were treated with chemotherapy, pulmonary metastasectomies, and physiotherapy. Both patients were able to perform all movements without limitations of their new upper lower limbs and utilize prosthetic lower legs.

Conclusions.

1. Limb sparing rotationplasty technique avoids total amputation, ensures the patient's ability to ambulate with two limbs, and provides the patients with better quality of life as the necessity for crutches or wheelchair assistance is reduced.
2. Riga's Children's Clinical University Hospital provides progressive and innovative medical treatments that tangibly manifests in the better wellbeing of the patients.

RECENT ADVANCES ALLOW BETTER IVF SUCCESS RATES BUT DO NOT GUARANTEE BIRTH OF A HEALTHY BABY

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Objectives. Preimplantation genetic testing (PGT) comprises a group of genetic assays used to evaluate embryos before transfer to the uterus. But unfortunately, the normal chromosomal profile of transferred embryo does not exclude the possible syndromic monogenic, multifactorial conditions or anatomical abnormalities in the fetus, that can be discovered by ultrasound examination during the first and early second trimesters, giving the opportunity for the family to decide whether to continue the pregnancy or terminate it.

We present a case of multiple fetal anomalies that were revealed after single embryo transfer, tested for chromosomal abnormalities by NGS in primigravida woman.

During the first trimester screening tetralogy of Fallot was suspected and confirmed at 17⁺¹ weeks by extensive echocardiography. NIPT test was performed, demonstrating low risk for selected microdeletions.

On week 17 additionally, skeletal abnormality (spine ossification anomaly of the cervical vertebrae, and hemivertebra causing spine thoracic scoliosis), agenesis of the right kidney, adduction of thumbs and single umbilical artery were detected. Comparative Genomic Hybridization has shown normal results. The family opted for pregnancy termination due to substantial risk of serious handicap. Post-mortem investigation and X-ray imaging confirmed prenatal ultrasound findings. The final diagnosis still includes various syndromic conditions and further molecular testing is planned. Some of differentials still are caused by unknown factors, among them VACTREL association, that stands for vertebral defects, anal atresia, cardiac defects, tracheo-esophageal fistula, renal anomalies, and limb abnormalities.

Patients and health care providers should be aware that negative preimplantation genetic test as well as normal NIPT results, does not exclude genetic or structural abnormalities in a child. Ultrasound examination in late 1st trimester is mandatory to enable a timely detection of fetal development aberration. Technical improvements in diagnostic ultrasound and knowledge progress in prenatal diagnostics is boosting the understanding of many fetal disorders.

REMOTELY SUPERVISED HIGH INTENSITY INTERVAL TRAINING IN PATIENTS WITH BREAST CANCER UNDERGOING NEOADJUVANT CHEMOTHERAPY

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Objectives. High-intensity interval training (HIIT) has been shown to improve aerobic endurance more than moderate intensity training modalities, however, effects of such training during neoadjuvant chemotherapy for patients with breast cancer (BC) have not yet been studied. This study investigated the impact of the RS-HIIT intervention on physical fitness level of patients with BC undergoing neoadjuvant chemotherapy.

Materials and Methods. Fifteen women (mean age 47.40, SD = 8.38 years) with newly diagnosed with BC (stage II and III) and prescribed neoadjuvant chemotherapy were randomized to remotely supervised RS-HIIT group (n = 8) and control group (CG) (n = 7). The RS-HIIT group participated in 4x4 min interval walking training at 85–95% HRmax with 3 min of active resting periods at 70% HRmax between each interval 3x/week for 6 months. Participants used a heart rate monitor (Polar H10) and Polar Flow App for remote supervision by researchers. The control group received standard care treatment. All participants performed cardiorespiratory test on treadmill test (VO2peak), sit-to-stand (measures taken at 5 sec and 30 sec) test, and 6 minutes walking test (6MWT) before and after the study.

Results. Before the study no significant differences were presented in any test outcomes between groups. After study the RS-HIIT demonstrated significantly higher relative VO2peak outcomes than CG (p = 0.022). Within group result changes from pre to post study indicated significant improvements for the RS-HIIT group in sit-to-stand scores at 5 sec and 30 sec assessment (p = 0.017 and p = 0.012, respectively), and VO2peak (p = 0.042), while for CG outcomes of the relative VO2peak and in sit-to-stand scores at 5 sec measure significantly decreased (p = 0.046 and p = 0.028, respectively).

Conclusions. HIIT improved physical fitness test outcomes in patients with BC during neoadjuvant chemotherapy.

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ROLE OF MRPS18 FAMILY PROTEINS IN DEVELOPMENT OF EMBRYONIC TUMOURS

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Objectives. Our study aims to reveal the fine mechanisms of regulation of cell stemness and differentiation by MRPS18-2, together with RB. We believe that MRPS18-2 may serve as a new target for anti-cancer therapy. The new knowledge will allow us to propose the new approach to evoke differentiation or cell death in childhood tumors, by downregulating the MRPS18-2 protein levels in cancerous cells.

Several different forms of embryonic cancers, including neuroblastoma, glioma and medulloblastoma and retinoblastoma, arise from precursor cells that fail to undergo terminal differentiation. These tumors are usually detected at an early age; the cancer starts to develop during embryogenesis. These diseases are rare: approximately 1–2 cases in 14 000–18 000 live births. For now, surgery, irradiation and chemotherapy are the main methods of treatment. However, patients with aggressive form of tumors show a lower rate to be cured; chemotherapy is often worsening the burden of irradiation. Hence, the approaches to cure tumors should be created.

Materials and Methods. Earlier, we have shown that the RB-binding human mitochondrial ribosomal protein MRPS18-2 can immortalize and transform primary cells, when overexpressed. Moreover, MRPS18-2 is expressed at high levels in stem cells and in cancers, namely, endometrial, prostate, breast, liver cancers, lymphomas and gliomas.

Results. Our results, as well as our analysis of published microchip data, indicate increased expression of MRPS18-2 protein in stem cells as well as in tumor cells. In summary, we believe that RB and MRPS18-2 proteins cooperate in maintaining the stem cell phenotype: stem cells that can be terminally differentiated must express both RB and MRPS18-2 proteins. We proved the proposed hypothesis experimentally, using *RB1* knockout mouse fibroblasts and knockout model *Danio rerio*.

Conclusions. We believe that MRPS18-2 may serve as a new target for anti-cancer therapy. In summary, our study will allow development of a new approach to combat human cancer.

SIMULATION OF EFFECTIVENESS OF SECONDARY RISK-REDUCING STRATEGIES IN CARRIERS OF PATHOGENIC VARIANTS OF BRCA1 AND BRCA2 WITH UNILATERAL PRIMARY BREAST CANCER AFTER BREAST-CONSERVING SURGERY

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Objectives. The aim of the present study was to develop a personalized risk management decision support tool for carriers of pathogenic variant of *BRCA1* and *BRCA2* who underwent breast-conserving therapy for unilateral early stage breast cancer.

Materials and Methods. We predicted the 40-year overall survival of different risk-reducing strategies for 144 cohorts of women defined by the type of pathogenic variant of *BRCA1* and *BRCA2*, age at primary breast cancer diagnosis, breast cancer subtype, stage of primary breast cancer, presence or absence of adjuvant chemotherapy.

Results. Absence of adjuvant chemotherapy was the most powerful factor that was linked to dramatic decline in survival for breast cancer patients with pathogenic variant of *BRCA1* and *BRCA2*. There was a negligible decline in the mortality in carriers of pathogenic variants of *BRCA1* and *BRCA2* with triple-negative breast cancer, who received no chemotherapy and underwent any secondary risk-reducing strategy compared to surveillance. However, most of carriers of pathogenic variant of *BRCA1* and *BRCA2* with triple-negative breast cancer in I stage profited from bilateral risk-reducing mastectomy and risk-reducing salpingo-oophorectomy/ or just risk-reducing salpingo-oophorectomy. Most carriers of pathogenic variant of *BRCA1* and *BRCA2* with luminal breast cancer in stage I-II unilateral breast cancer, profited from bilateral risk-reducing mastectomy and risk-reducing salpingo-oophorectomy. Most of older patients with *BRCA1* and *BRCA2* pathogenic variant in exon 12–24/25 with luminal breast cancer may gain a similar survival benefit from other risk-reducing strategies or surveillance.

Conclusions. Our study showed that it is mandatory to take into account the complex interplay between the type of *BRCA1* and *BRCA2* pathogenic variant, age at primary breast cancer diagnosis, breast cancer subtype and stage and received systemic treatment.

THE AUTOMATED IOT SYSTEM FOR THE GSK ELLIPTA INHALER TO ASSESS PATIENT ADHERENCE

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Objectives. Develop and test an autonomous, portable device for drug usage monitoring. The device aims to record the release of a dose of the GSK Ellipta Inhaler medication and send the information to the data collector and make it accessible to the doctor. The system is made to maximize the efficiency of drug use by providing the facility with detailed information collection and referral to a specialist who can thus effectively treat the patient, bringing the necessary adjustments to drug use.

Materials and Methods. The project use now rapidly advancing IoT system, which allows the device to be as compact and energy efficient as possible with minimal stress on the patient. The enclosed system module binds directly without any modification of the inhaler, additionally, it puts minimal stress on the patient, making it suitable for a wide range of cases. Various data collection methods are used for the optimization.

Results. The number of doses administered by the inhaler was compared with the number of doses recorded by the device in 10 study subjects. The device has recorded all doses released by the inhaler, i.e. whether the information in the device dose counter and the electronic database match. In this sample of study subjects, there was one case in which the planned dose was not recorded. This result can be considered very good and correlates well with the real-time signal-tracking finding described above.

Conclusions. We conclude that, overall, the device performs all its functions. We have observed a significant improvement in patient adherence (close to 100%) compared to the adherence reported in the literature (35–70%). We expect that improvements in disease control would also be observed over a longer period of data recording.

THE WALKAIDE DEVICE IN GAIT THERAPY FOR STROKE PATIENTS

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Objectives. As part of rehabilitation, the paretic lower limb can be stimulated using WalkAide. The most common localization of functional electrical stimulation is the peroneus nerve, which is responsible for performing the dorsiflexion in the ankle joint. The aim of the present study was to propose a methodology for the objectification of the influence of electrical stimulation using WalkAide on selected walking parameters.

Materials and Methods. Probandes were randomly divided into two groups. The control group underwent standard gait therapy without the WalkAide, and the experimental group underwent gait therapy with the WalkAide device. Both groups were loaded with the same time unit of therapy for 4 weeks for each proband. The TUG and 10MWT clinical walking tests were included among the evaluation tools. Using the HP Cosmos zebris Treadmill FDM-T device, selected walking parameters (step length, double step length, cadence) were measured. Selected gait parameters were statistically compared using the paired Wilcoxon test.

Results. The results show that the monthly inclusion of the WalkAide neurostimulator in gait therapy in patients in the subacute phase after stroke has a significant effect on the extension of the double step ($p = 0.028$). The increase in walking speed, from 0.42 m/s to 0.45 m/s when using WalkAide in therapy, is also considered a statistically significant result ($p = 0.043$). Probandes were measured before the start of therapy and at the end of 4 weeks of therapy.

Conclusions. This study points to the possibility of evaluating the effect of WalkAide using selected walking parameters with the use of the zebris system (cadence assessment, length of two steps) and without its use (clinical test 10MWT). The evaluation can be applied in clinical practice thanks to the rapid evaluation of monitored parameters. Paper prepared as part of the project: KEGA 003KU-4/2021 “Zrýchlené formy rehabilitačných postupov po chirurgických zákrokoch”

VIRTUAL LARYNGOSCOPY FOR AIRWAY MANAGEMENT PLANNING IN PATIENT WITH DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS

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Objectives. Diffuse idiopathic skeletal hyperostosis (DISH) is associated with abnormal ossification of the anterolateral spine. DISH at cervical levels can make intubation difficult or impossible. We report a patient with cervical DISH who was admitted for unrelated lumbar hemilaminectomy. Preoperative radiographs of the cervical spine revealed previously undiagnosed cervical DISH with large C3–4 osteophyte at the level of laryngeal opening. In view of possible intubation difficulties, modified computed tomography scan was performed to use it for three dimensional reconstruction (virtual laryngoscopy). Virtual laryngoscopy images showed that satisfactory view of the larynx during videolaryngoscopy would be difficult, but passage of endotracheal tube at the level of obstruction is possible. During intubation videolaryngoscopic views corresponded with virtual laryngoscopy images. Successful intubation was achieved at first attempt using external laryngeal manipulation. In conclusion, virtual laryngoscopy can be useful for predicting videolaryngoscopic view but passage of endotracheal tube is better assessed with non-reconstructed images.

WHAT IS FOUND FROM PLACING A CONTINUOUS GLUCOSE MONITOR IN OVERWEIGHT NON-DIABETIC REPRODUCTIVE AGE WOMEN WITH INSULIN RESISTANCE

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Objectives. Continuous glucose monitoring (CGM) evaluates the frequency with which individuals demonstrate elevations in postprandial glucose, the types of patterns, and how patterns vary between individuals, which is a great opportunity for preventive medicine to provide individual preventive diet / lifestyle recommendations.

Materials and Methods. We have used glucose measurement with Dexcom Continuous Glucose Monitoring (CGM), which is a minimally invasive electrochemical sensor that is inserted below the skin.

With CGM, 14 study participants determined their blood sugar patterns.

Statistically, we calculated the average blood glucose daily for 10 days, the coefficient of variation, the verified time in the range, the fixed low and high blood glucose patterns.

We used a muesli bar with a total carb count of 45 g, mostly starch (adapted starch test); and measured the glycemic response.

To determine hunger, we used the hunger analog scale

Results. 73% of the participants experienced episodes of hyperglycaemia. (And 3% in the diabetic range).

Another interesting finding was after an adapted starch tolerance test; which revealed different glycemic curves with a similar amount of starch.

We have seen the variation in glucose, which is more noticeable for most participants in cases where carbohydrates are eaten without a source of fat or protein.

Hunger felt stronger when blood sugar began to drop rapidly, not when the blood glucose level was in the “lowest” normal range.

Conclusions. CGM turns to *a mindful eating approach*.

My hypothesis on different glycemic curves with a similar amount of starch – it can be associated with different salivary amylase activities – will be tested further.

Furthermore, interesting was that hunger felt stronger when blood sugar began to drop rapidly. Subjects with out persistent hunger tended to have the lowest glycemic variability.

Using CGM data, individual nutritional recommendations can be prepared, which could reduce the coefficient of glucose variation and episodes of hyperglycaemia.

UMBILICAL VEIN CATHETERIZATION TASK TRAINER – TECHNICAL REPORT

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Keywords. Simulation-based learning; Umbilical vein catheterization

Introduction. Umbilical vein catheterization may be a life-saving procedure in neonates who require vascular access and resuscitation. To safely perform manipulation, not only theoretical training is necessary, but also manipulation training on a task trainer. Manufactured task trainers are expensive. So medical students, to master the manipulation, create impromptu task trainers, which do not reflect real anatomy accurately. The purpose of the work was to create an open-source 3D model of the umbilical vein catheterization simulator, so that anyone with the ability to 3D print and work with silicone could make high-quality umbilical vein catheterization task trainers for workshops, thereby increasing quality of performed manipulation and patient safety.

Case Description. Hospital workers whose competence includes umbilical vein catheterization were interviewed to find out the dimensions and functions of the model. In the open-source 3D modeling software, according to the specifications, a 5-part task trainer was created. The model was a mold for pouring silicone, from which the abdominal region and a 10 cm umbilical cord with two arteries and one vein were obtained. After printing the model, white (umbilical cord) and pink (skin) silicone was poured into the mold. After the silicone hardened, the simulator was removed from the mold, the umbilical cord of the simulator was clipped with a real umbilical cord clip to increase fidelity of the task trainer.

Summary. Task trainer has been published to the public access, it can be recreated by anyone, and using it, it is possible to demonstrate and train all the stages of placing an umbilical vein catheter. Doctors and nurses involved in testing recognized high fidelity and functionality of the task trainer.

Conclusions. The development and publication in open access easy-to-manufacture and cheap-to-produce simulators makes the training of medical manipulations more accessible, which positively affects the professionalism of medical workers.

EVALUATING THE EFFICACY OF A NEW MENTAL VISUALIZATION FOR TEACHING INTUBATION TO MEDICAL STUDENTS: A COMPARATIVE PILOT STUDY

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Keywords. Mental training; Cognitive training; Mental rehearsal; Simulation; Mental visualization; Intubation

Objectives. This paper describes a mental visualization protocol created based on suggestions from other research and its application in teaching intubation to medical students.

Materials and Methods. A new mental visualization protocol was created from literature and recommendations. Participants were 3rd and 4th year medical students divided into groups based on study year, intubation experience, and hand-dominance. The new protocol's efficacy was evaluated by comparing the control group given basic information to the experimental group given the new protocol and script. Intubation skill was evaluated by measuring intubation duration, depth, attempts, tooth trauma, fixation grade. Participants also answered questions about visualization practice and their perception of intubation skill before & after the workshop. Evaluation of intubation skill happened after the intubation skill workshop (AW) and three days later during evaluation (AE). Goal's to evaluate efficiency of mental visualization protocol.

Results. The study consisted of 2 groups – experimental group (EG) and control group (CG) of 6 participants each. CG mean intubation time AW:46.6 s ± 22.1, AE:68.3 s, tooth trauma AW:1 time, AE:3 times, average intubation depth AW:22.6cm ± 2.0, AE:24.00cm ± 0.89, mean fixation grade AW & AE:2.83 ± 0.40, Subjective intubation skill before the workshop:1.67 ± 1.2, AE:3.67 ± 0.81, average number of visualization sessions per day:2.00 ± 1.2. EG mean intubation time AW:37.2 s ± 10.4, AE:54.2 s ± 11.2, tooth trauma AW:2 times, AE:3 times, average intubation depth AW:23.8 cm ± 0.75, AE:23.8 cm ± 1.1, stylet used AW & AE:6/6 cases, mean fixation grade AW:2.50 ± 0.83, AE:2.83 ± 0.40, Subjective intubation skill before the workshop AW:1.50 ± 1.22, AE:4.17 ± 0.98, average number of visualization sessions per day:1.33 ± 0.51. Both groups devoted 2.17 ± 1.1 days to visualization.

Conclusions. This suggests that the protocol may be an effective tool for teaching intubation to medical students.

WOMEN'S AND CHILDREN'S HEALTH

“THE CHILD 1 PER 240 000” – CASE OF A 14-YEAR-OLD BOY WITH ACTH-DEPENDENT HYPERCORTISOLISM

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Objectives. Cushing's Disease which affects 2.4 million people annually, is a condition in which the pituitary gland releases too much adrenocorticotrophic hormone. One of the most important symptoms of the disease in children is inhibited growth, increased body weight and skin changes.

Our aim of the study is to introduce diagnostic process and treatment of pituitary microadenoma that caused ACTH-dependent hypercortisolemia in 14-year old child. We analysed the clinical case of a 14-year old boy with ACTH-dependent hypercortisolemia.

Boy was referred to the Department of Pediatrics, Endocrinology, Diabetology with Cardiology Division, Medical University of Białystok due to obesity 76 kg (90-97 centile) and short stature 155 cm (3-10 centile). Past medical history of the patient included surgery of left inguinal hernia. Physical examination revealed ginecomastia, acne and stretch marks.

Materials and Methods. Laboratory tests indicated HOMA index 4,3, ACTH at 8:00 132 µg/mL, morning cortisol 771 nmol/L, night cortisol 365 nmol/L and cortisol after 1mg DXMT 145 nmol/L. General parameters remained on a normal level. MRI examination showed microadenoma (6x4 mm) in the right side of the glandular plate. Further examination of this change was completed by scintigraphy Tc99m which showed a possible overexpression of somatostatin receptors in the area of pituitary gland. Ophthalmological consultation revealed reduction of the field of view to 30 degrees

Results. Patient was referred to Neurosurgical Clinic in Warsaw for transphenoidal microadenoma resection. Boy is obligated to substitute hydrocortisone everyday with dose increase during stress or fever.

Conclusions. Cushing's disease is ACTH-dependent disease which gives many metabolic complications and can lead to life-threatening conditions. The treatment includes normalization of hormone levels and hence withdrawal of metabolic disturbances and clinical symptoms. Microadenoma is a rare cause of ACTH-dependent hypercortisolism in children however small tumors can be omitted by MRI. Therefore scintigraphy should be concerned when MRI is inconclusive.

ASSESSMENT FOR SUBTLE COLLAGENOPATHY PREDICTS PRETERM BIRTH AMONG PREGNANT WOMEN WITH SHORT CERVIX

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Objectives. Genetic disorders affecting connective tissues (e.g., Ehlers-Danlos syndrome, Marfan syndrome) are known risk factors for cervical shortening during pregnancy and preterm birth. Recently our group revealed 12 genes primarily related to cervical shortening, the majority of which are known to cause collagenopathies, thus proposing an idea of cervical shortening as a subtle form of collagenopathy. The aim of our study was to analyse association between collagenopathy and pregnancy outcomes among pregnant women with cervical insufficiency or short cervix.

Materials and Methods. Seventy patients from Riga Maternity Hospital in Riga, Latvia, between 2017 and 2021 were included in the prospective longitudinal cohort study. Women with singleton pregnancy and cervical shortening (defined as cervical length \leq 25mm before 28 weeks of gestation) were clinically examined for collagenopathies. Examination was performed by using the modified Beighton-Brighton score which was developed by our group with the aim to identify subtle collagenopathies.

Results. The mean cervical length at inclusion was 12.5 mm \pm 7.6 SD. Complaints (pelvic pressure, weak irregular contractions and/or backache, change in vaginal discharge) at the time diagnosis was made in 22 (31.4%) of patients. The modified Beighton-Brighton score reached threshold indicating collagenopathy in 13 (18.6%) patients. There were 37 (52.9%) cases of preterm birth or second trimester loss. The presence of collagenopathy significantly predicted chance to have preterm birth ($B = 1.478$, $z = 2.00$, $p = 0.046$, $OR = 4.38$). The presence of collagenopathy increased the chance to have preterm birth by 4.38 times on average (CI 95% [1.0–18.70]).

Conclusions. The results of our study make contribution to the existing knowledge about the association between collagenopathies and preterm birth. The implementation of the modified Beighton-Brighton score in clinical practice could facilitate rapid identification of pregnant women at high risk for preterm birth.

ASSESSMENT OF MEDICAL SPECIALISTS' KNOWLEDGE AND ATTITUDES TOWARDS NON-INVASIVE PRENATAL TEST (NIPT)

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Objectives. To evaluate the knowledge and information of medical professionals', compare the knowledge and attitudes of obstetricians-gynecologists, GPs and midwives, compare the approach with other screening methods for chromosomal abnormalities, find out the opinion about the need for NIPT before including this test in personal health care services provided in Lithuania from Health Insurance Fund.

Materials and Methods. A study was conducted in December 2021 – March 2022 among Lithuanian obstetricians, midwives and family doctors using online questionnaires from www.apklausa.lt. Statistical analysis of the data was performed using SPSS 27.0.

Results. The average knowledge of medical specialists' about NIPT was 5.89 (± 3.3) from 10: among the obstetricians the average of knowledge was 8.08 (± 1.46), midwives – 6.96 (± 1.73), GPs – 5.39 (± 2.45). According to respondents, NIPT lags behind other screening tests in terms of cost (80.9%), duration of results (39.5%), but NIPT may be performed earlier in pregnancy (77.7%), is more accurate (71.6%), avoids invasive procedures (81.5%). Almost all (94.6%) obstetricians and midwives (92.3%) say they trust the results of NIPT, but only 66.7% of GPs say they trust them. The majority of respondents (87.7%) noted that NIPTs should be funded by the national screening programme, 39.4% of them believe that all pregnant women at high a priority risk, 29.6% only with high risk after Combined test.

Conclusions. Most medical professionals know what is NIPT, interpret this test correctly, rate their knowledge as average, trust the results, believe that NIPT is more accurate, can be performed earlier in pregnancy and helps prevent invasive procedures compared to other non-invasive tests, say there is a lack of information. Obstetricians and midwives have more confidence in the results than GPs. Almost all agree that the NIPT should be funded as the national screening programme for all patients, or for increased results after other screening tests.

ASSOCIATION BETWEEN HIGH-RISK HPV E6/E7 MRNA EXPRESSION AND SEVERITY OF CERVICAL PRECANCEROUS LESIONS

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Objectives. Genital high-risk human papillomavirus (HR-HPV) infection is the main cause of cervical precancerous lesions and cervical cancer. There is emerging evidence that HPV E6/E7 mRNA detection could predict the detection of high-grade cervical lesions. But still, this method is not included in the diagnostic algorithms. This study aimed to evaluate an association between high-risk HPV E6/E7 mRNA expression and the severity of cervical precancerous lesions.

Materials and Methods. A study was performed from 2016 to 2020. The study group included patients referred for colposcopy due to abnormal cytological smears. The control group consisted of women who came for a gynaecological check-up. Material from the cervix was tested for high-risk HPV E6/E7 mRNA. Colposcopy was performed in all participants; cervical biopsies with subsequent histological analysis were taken from all study group subjects and in case of visual suspicion for CIN in the control group. Cases of CIN2, CIN3, and cervical cancer were combined and further analyzed as CIN2+. The results were compared between the control group, CIN1, and CIN2+ group.

Results. The study group had 31 CIN1 and 79 CIN2+ cases. The control group consisted of 117 women. Positive HPV E6/E7 mRNA expression was detected in 58.1% of CIN1 cases, 89.9% of CIN2+, and 12.0% of the control group women. The odds ratio for CIN1 compared to the control group was 2.0 (95% CI 1.4–3.0, $p < 0.0001$), and for CIN2+ OR was 5.6 (95% CI 3.4–9.1, $p < 0.0001$).

Conclusions. The present study shows a significant association between high-risk HPV E6/E7 mRNA expression and the severity of cervical lesions. This method could be used as a non-invasive test to predict the severity of the cervical disease.

CAVERNOUS HEMANGIOMA OF UTERINE CERVIX IN PREGNANCY: REPORT OF A RARE CASE

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Objectives. The incidence of hemangioma in different parts of the body is quite common. The occurrence of this vascular lesion in the female genital tract, particularly in the uterine cervix, is rare. It is a benign tumor. Hemangiomas, induced by pregnancy, increase during pregnancy and regress usually after delivery. The symptomatology is not unequivocal and when it occurs during pregnancy or postpartum, it causes life-threatening cataclysmic hemorrhage. We reported a case of cavernous hemangioma of the cervix in a 44-year old healthy multiparous patient, referred to our Centre in the 11–12 gestational weeks with periodic genital bleeding. A 4cm x5cm soft regular purplish red mass is found in the anterior uterine cervix. Her history during this pregnancy was free of vaginal or postcoital bleeding, cramping, or gynecologic problems. Results of the physical examination, all laboratory tests, cytology and cervical cultures were normal. Colposcopy examination for excluding of cervical precancer lesions had been performed in Colposcopy Center. During colposcopy, application of acetic acid further defined the lesion as an extensive thick plaque involving most of the cervix. Ultrasound (USG) of the small pelvis revealed a single intrauterine live fetus of 12⁺⁰ weeks of gestation, dilated blood vessels in the lower segment of the uterine cavity, which continue as a pronounced plexus of blood vessels in the canal to the cervix in the anterior part. At the time of submission the abstract, patient had 38⁺⁶ gestational weeks. 25.01.2023 the patient is scheduled for a planned caesarean section. To avoid unexpected bleeding from haemangioma, patients should be repeatedly examined for haemangioma of the birth canal, and special care should be taken in choosing the delivery mode. It is recommended to perform a Caesarean Section.

CERVICAL VOLUME REGENERATION AFTER LARGE LOOP ELECTROEXCISION

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Objectives. Large loop electro-excision (LLETZ) is a treatment method of high-grade cervical intraepithelial neoplasia. LLETZ increases preterm labor risk due to mechanical cervical defects and an alteration of the cervical barrier, although the precise mechanism is unknown. This present study aims to calculate the cervical volume (CV) changes six months after the LLETZ procedure.

Materials and Methods. A prospective cohort study was performed in Rīga Maternity hospital from 2021–2022. Eight women of reproductive age who were scheduled for LLETZ were included. CV measurements were carried out with a predefined ultrasound measurement technique by one operator before and 6 months after LLETZ. To precisely measure CV three-dimensional: Virtual Organ Computer-Aided Analysis software was used. Cervical measurements included length, anteroposterior (AP), and transverse diameter (LL). CV difference was calculated by subtracting CV 6 months after LLETZ from the CV before LLETZ. Differences between two groups with different cervical healing patterns were compared using independent samples T-test, as data were normally distributed.

Results. The mean CV before LLETZ was $19.81 \text{ cm}^3 \pm 7.72$ and 6 months after LLETZ $19.50 \text{ cm}^3 \pm 5.36$. We observed two different cervical healing patterns. In four patients the mean CV after 6 months decreased (mean = $0.93 \text{ cm}^3 \pm 0.05$), as expected, and in another four the CV increased (mean = $1.14 \text{ cm}^3 \pm 0.02$). When comparing these two groups they differed by 0.24 cm^3 , $t(6) = -9.2$, $p < 0.003$ CV increased by the means of enlargement of cervical AP and LL diameters after 6 months. AP was larger by $0.61 \text{ cm}^3 \pm 0.38$ and LL by $0.83 \pm 0.49 \text{ cm}^3$, compared to the group with decreased volume.

Conclusions. Different cervical healing patterns were observed. The cervical volume increase could be attributed to an increase in AP and LL diameters but a decrease to resected cones volume. More research with a larger sample size is needed to determine cervical healing patterns and their clinical significance

CHILDREN'S RIGHTS' BASED PAIN MANAGEMENT STRATEGY

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Objectives. Healthcare protocols and services are required to be organized in compliance with universal principles of the United Nations Convention on the Rights of the Child, to ensure that well-being, safety, and interests of children are protected. Pain is one of the most common symptoms presented in unwell children. It is crucial to ensure children get healthcare services of the highest standard (Article 24 of the Convention), including appropriate pain control.

Materials and Methods. Evaluation of the observance of Children's rights has been performed in the multi-specialty pediatric department of Children's Clinical University Hospital in April-May 2022. Children aged 5 to 11 ($n = 11$), teenagers aged 12 to 17 ($n = 18$), parents ($n = 20$), and personnel ($n = 24$) were involved in questionnaires and interviews. Statistical analysis was made by SPSS 28.0 ($p < 0.05$). The study was approved by the Institutional Ethics Review Board.

Results. 18.2% of children, 5.9% of teenagers, and 5% of parents disagree that patients were regularly asked about the presence of the pain, and 8.3% of the personnel agree they do not ask routinely ($p = 0.679$), albeit almost all of them (95.8%) use a visual analogue scale to measure pain intensity. 11.8% of the patients and their parents did not receive pain intervention at least once during hospitalization. 26.3% of the patients with chronic or recurrent pain and their parents did not receive recommendations for pain management. 79.2% of the personnel were not educated in pain management strategies, including non-pharmacologic types of pain relief.

Conclusions. The performed study revealed the following areas of further action. There is an urgent need for education in pain management strategies in children for personnel. One in five hospitalized children were not asked if they have any pain, and one in ten did not get help with the pain they had, therefore pain control algorithm should be updated.

CLINICAL, MOLECULAR BIOLOGICAL, AND MICROBIOLOGICAL INTEGRATED INVESTIGATION IN CASE OF PAEDIATRIC ACUTE COMPLICATED AND UNCOMPLICATED APPENDICITIS

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Objectives. AA is the most common indication of emergency abdominal surgery in childhood and requires prompt evaluation and recognition of the stage. The aim was to evaluate urine and serum biomarkers for the early and accurate diagnosis of AA, and differentiation of AuA and AcA, to determine the prevailing microbiota, and to evaluate antibacterial sensitivity.

Materials and Methods. Prospective, single-center randomized controlled cohort study including 153 children (7–18 years) admitted to the hospital due to acute abdominal pain with the possibility of appendicitis. IL-6, NGAL, and LRG1 concentrations in urine and serum were measured on days 0, 2, and 5. Microbiological culture swabs from the appendix and peritoneal cavity were collected intraoperatively.

Results. The s-LRG1 levels of AA versus the Ctr with a cut-off value of 51.69 µg/mL generated an area under the curve AUC of 0.95 (95% CI 0.91–0.99, $p < 0.001$). The s-LRG1 cut-off value was 84.06 µg/mL for AcA diagnosis compared with AuA, and, therefore, it showed a significant AUC of 0.69 (95% CI 0.59–0.80, $p = 0.001$). Median Day 0 s-NGAL was 199.55 ng/mL for AcA, 135.20 ng/mL for AuA, and 90.60 ng/mL for the Ctr ($p = 0.020$). The basal average s-IL-6 levels were 79.45 ng/mL for AcA, 23.14 ng/mL for AuA, and 10.93 ng/mL for the Ctr ($p < 0.001$). On Day 2, s-NGAL levels were higher in AcA than AuA ($p < 0.001$).

Conclusions. A combined diagnostic model of IL-6, LRG1, and NGAL at the ED may provide a new approach for differentiating AA and other causes of abdominal pain, also AcA versus AuA. *E. coli* is the main causative agent of AuA in children demonstrating a wide range of antibacterial susceptibility. *P. aeruginosa* is identified more frequently in AcA. Antibiotic treatment strategies in cases of AcA should include antibiotics with different mechanisms of action to achieve a synergistic effect and prevent the development of antibiotic resistance.

COMPARISON OF IMPAIRED ADAPTATION OF THE TERM NEONATES AFTER SPONTANEOUS OR INDUCED LABOR IN THE HIGH-RISK III LEVEL PERINATAL CENTRE

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Objectives. To compare the main medical problems that neonates have after being born in induced labor versus spontaneous labor.

Materials and Methods. This prospective study was conducted from 1st May till 30th November, 2022, in Pauls Stradins Clinical University Hospital III level Perinatal Center. We included neonates from term singleton pregnancy with cephalic presentation and without scheduled cesarean section that needed any medical attention after delivery. All data were analyzed using MS Excel and IBM SPSS Statistics program.

Results. During the study period 686 babies were born, 20 neonates were included in the study: 5 – in spontaneous labor, 15 – in induced one. Positive ventilation (Neopuff) received 2 neonates after spontaneous delivery and 8 after induced labor. Mechanical ventilation or CPAP after delivery room stabilization needed in 1 and 7 neonates accordingly. Four neonates were transferred to the NICU after spontaneous delivery, and 9 – after the induced labor. Among them: 1 neonate with hypoxic-ischemic encephalopathy, 2 – seizures, 1 – transient hypoglycemia, 2 with low Apgar score at 5 minutes. Two neonates needed prolonged treatment. There was none with such need in the spontaneous labor group. Acidemia in umbilical cord blood (pH < 7.20) was in 1 neonate after spontaneous labor and in 10 neonates after induced labor. No extra medical attention was needed in 5 babies after 72 hours of life after induced labor, there was none in the spontaneous labor group.

Conclusions. After induced labor neonates with impaired adaptation were more prone to receive positive ventilation or transferred to NICU than likewise neonates after spontaneous labor. Although more neonates in the induced labor group after impaired adaptation were discharged without any complications.

COMPARISON OF KNOWN RISK FACTORS FOR TYPE 1 DIABETES DEVELOPMENT IN ASSOCIATION WITH SARS-COV-2 VIRUS EXPOSURE

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Objectives. Since the beginning of the COVID-19 pandemic, many medical centres have reported an increase in the incidence of primary diagnosed Type 1 diabetes (T1D) in paediatric population. The aim of this study was to evaluate the impact of previously known risk factors for new-onset T1D development in association with SARS-CoV-2 infection.

Materials and Methods. In this cross-sectional study data of 90 patients diagnosed with new-onset T1D was analysed using the Children's Clinical university hospital (CCUH) database. Patients were divided into two respective groups of those exposed and non-exposed to COVID-19 infection. MS Excel and IBM SPSS Statistics were used for data compilation and analysis.

Results. From all analysed risk factors in patient groups of non-exposed versus exposed to SARS-CoV-2 infection, it was determined that there was no statistically significant association of D vitamin level for both groups ($p = 0.176$). Positive family history for T1D was more commonly observed in the non-exposed 15.4% ($n = 8$) versus the exposed 3.5% ($n = 2$) group, however this risk factor was not statistically significant for both groups ($p = 0.181$). Mothers of 72.5% ($n = 37$) non-exposed and 75.7% ($n = 28$) exposed patients were older than 25 years old at the time of pregnancy, but no association was found for development of T1D ($p > 0.999$). Cow milk consumption before 6 months of age was more common in non-exposed group 80.8% ($n = 21$) versus exposed 42.1% ($n = 16$) and showed statistically significant difference ($p = 0.002$).

Conclusions. We conclude that many known risk factors (D vitamin level, family history of T1D, mothers age of more than 25 years during pregnancy) did not have statistically significant difference in patients exposed and non-exposed to SARS-CoV-2 infection. However, early introduction of cow milk in infants' diet was significantly more common in non-exposed group, suggesting that there could be other impact factors associated with T1D development since the start of the pandemic. The research will be continued.

COMPARISON OF PRIMARY CLINICAL MANIFESTATION OF TYPE I DIABETES IN CHILDREN WITH AND WITHOUT PREVIOUS EXPOSURE OF SARS-COV-2 VIRUS

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Objectives. Since COVID-19 pandemic, multiple research centres have pointed out an increase in incidence of type 1 diabetes (T1D). The same trend of significantly increasing number of new cases has been recognized in Latvia. In addition, observations show more severe primary manifestation than it was before pandemic. However, so far studies were based on patient division in pre-pandemic and pandemic cases. Our aim was to analyse, whether initial manifestation of T1D differs between patients with or without previous SARS-CoV-2 exposure.

Materials and Methods. In this cross-sectional study patients were included both prospectively since August 2022 and retrospectively from year 2019, using medical records. Patients were divided depending on previous COVID-19 history: research group (exposed to SARS-CoV-2 before T1D) and control group. Data about initial T1D manifestation and metabolic status were collected and analysed.

Results. In total, 103 patients were included in this study: 50 (48.5%) in research group (57.9% boys), 53 (51.5%) in control group (53.8% boys). Median age in groups were 9.46 (6.59–12.2) and 9.16 (3.86–13.05) years accordingly. Duration of diabetes symptoms before hospitalization was identical in both groups – median 14 days. Symptoms with significantly higher prevalence among research group were nocturia, enuresis, loss of appetite, behavioural changes and mood swings ($p < 0.05$). Results showed no difference in severity of ketoacidosis (DKA) and blood gas analysis by the time of hospitalization between groups. Patients from research group were more often admitted to intensive care unit (36% versus 26.6% in control group), but difference wasn't significant. Median HbA1c values in research and control groups were 12.34% (10.97–14.49) and 12.08% (10.57–13.81) accordingly, showing no statistically significant difference ($p > 0.05$).

Conclusions. Comparing SARS-CoV-2 exposed and nonexposed patients, no significant difference in severity of T1D primary manifestation has been found so far. Research will be continued in order to investigate possible reasons for increasing incidence of T1D.

COMPARISON OF TICK-BORNE ENCEPHALITIS CLINICAL DISEASE IN CHILDREN AND ADULTS: POPULATION-BASED STUDY IN LATVIA, 2018–2020

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Objectives. This study was aimed to compare and reevaluate symptomatology and clinical findings of Tick-borne Encephalitis (TBE) in children and adults, as various reports suggest that childhood TBE disease severity might be under-valued.

Materials and Methods. This was descriptive cross-sectional study that includes all reported laboratory-confirmed TBE cases in Latvia during 2018–2020. Nationwide population-based surveillance for TBE virus (TBEV) infected cases was conducted in collaboration with the Centre for Disease Prevention and Control, the National Reference Laboratory, and 15 hospitals of Latvia. After informed consent, clinical and laboratory data were collected by interview and review of medical records. All cases were categorized into age groups: children (1–17 years) and adults (18+ years).

Results. From 2018–2020, population-based surveillance identified 716 TBEV-infected cases in Latvia. Of them, 46 (6%) were in children. TBE without CNS involvement was detected in 129 patients; non-CNS TBE was seen in 4/46 (8.7%) children compared to 125/670 (18.7%) adults. Analyzing TBE cases with CNS involvement, most common clinical form for children and adults was meningitis – 86% and 87% respectively. All 13 (2%) deaths and all 21 patient (3%) discharged from the hospital with persisting paresis were in adults.

Conclusions. Although childhood TBE is considered to be a mild disease, mainly without CNS involvement, population-based data of Latvia demonstrates that TBE is also a potentially dangerous neurological illness in children. TBE follows similar clinical course in children and adults, mainly meningitis. However, in adults TBE more frequently progress to severe even lethal consequences.

DIFFERENT PATTERNS OF DELIVERY: DATA FROM RIGA MATERNITY HOSPITAL

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Objectives. Different interventions during childbirth are used to provide the safest care for the mother and child and to decrease maternal and perinatal morbidity and mortality. In current obstetric practice, operative vaginal delivery and Caesarean section rate is increasing and should be analysed in the context of increasing numbers in labour induction and extended usage of epidural analgesia in labour.

Materials and Methods. Rīga Maternity Hospital is the biggest second-level perinatal care centre in Latvia. The data from the hospital medical statistical system from 2020 to 2022 were analysed using Microsoft Excel. Approval of data sharing was provided by Rīga Maternity Hospital.

Results. Each year, the total number of deliveries in Rīga Maternity Hospital from 2020 to 2022 was above 5000. The Caesarean section rate has decreased from 21.7% in 2020 to 19.6% in 2022. Due to the broadening of indications during the analysed period, there was a marked increase in labour induction rate (from 29.8% to 39.9%) and usage of epidural analgesia (from 34.4% to 58.8%). Also, the frequency of vaginal operative delivery rate increased from 6.53% in 2020 to 8.9% in 2022. At the same time, perinatal mortality was the lowest among perinatal institutions in Latvia – 3.66%. The impact of delivery management is analysed in frames of the quality insurance system of the hospital. In 2022 in deliveries when epidural analgesia was used, 11.6% of patients had an operative vaginal delivery and 12.4% had a Caesarean section.

Conclusions. To ensure the quality of care and the results, in modern obstetrics it is important to base practice on current evidence and regularly perform data analysis that would confirm the impact of obstetric management on the health outcome of the mother and child.

DISSIMILARITY IN PLACENTAL VASCULAR DEVELOPMENT BETWEEN NULLIPAROUS AND MULTIPAROUS WOMEN

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Objectives. Nulliparity is associated with a higher risk of developing preeclampsia and lower birth weight of the newborns. The possible explanation for that is the differences in the placental development in the first pregnancy compared to the subsequent pregnancies. In this study we have hypothesized that this difference underlies in the placental vascular development and can be revealed with a help of 3D Doppler ultrasound examination.

Materials and Methods. In the present study we enrolled 76 nulliparous and 104 multiparous healthy women who attended our clinic for the first trimester screening. Using the 3D VOCAL software, we measured placental volume (PV), vascular (VI), flow (FI) and vascularization flow indexes (VFI) in the first and second trimester. The placental quotient (PQ) ($PV \text{ (cm}^3\text{)}/CRL \text{ (cm)}$) was calculated to adjust to the placental volume increasing with gestational age.

Results. Both study groups were demographically comparable except for the age. In the first trimester FI was significantly lower in nulliparas than in the women with a previous vaginal delivery ($p = 0.01$), however, this vascularity difference disappeared in the second trimester. No differences in other vascular indexes (VI, VFI), PV and PQ were found.

Conclusions. In this study, FI was significantly lower in nulliparas in the first trimester, but not in the second trimester. This finding reflects reduced placental blood flow intensity in the first trimester in primiparous women and supports the concept that placental vascular development differs in the first pregnancy compared to the subsequent pregnancies. This transient difference provides information for better understanding of placental development, especially taking in account that previous research had found that reduced FI is associated with a higher risk of foetal growth restriction. Moreover, this finding illustrates that 3D Doppler ultrasound examination in the first trimester is a useful tool for the investigation of placental development for different obstetrical risk groups.

FACTORS ASSOCIATED WITH HIGH-RISK HUMAN PAPILLOMAVIRUS INFECTION IN POPULATION OF LATVIAN WOMEN

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Objectives. Nearly all cervical cancers are caused by high-risk human papillomavirus (HR-HPV). In Latvia, organized cytology-based cervical cancer screening is in operation since 2009. In 2020 the age-standardized cervical cancer incidence in Latvia was 18.4 cases per 100 000 (6th highest in Europe). No HR-HPV prevalence population-based studies have been conducted among Latvian women.

Materials and Methods. A cross-sectional study took place from February 2021 to February 2022. The data for HR-HPV testing were collected at the 10 GP practices (general population) and among women referred for colposcopy to the Rīga East University Hospital colposcopy unit (colposcopy population). Vaginal samples were collected with a self-sample device – a dry cotton swab (FLOQSwabs™). Samples were analyzed with Cobas 4800 System for HPV 16 and 18 and pooled results of other HR-HPV types.

Results. The study included 1313 women, and 1274 participants provided a valid sample. The prevalence of any HR-HPV infection was 66.8% in the colposcopy population and 11.0% in the general population. In the colposcopy group (n = 530), HPV 16 was present in 34.2%, type 18 in 4.0%, and other HR-HPV types in 42.0%. In the general population group (n = 744), HPV 16 was present in 3.5%, type 18 in 1.2%, and other high-risk types in 7.5%. The prevalence of any HR-HPV for colposcopy group was the highest for respondents up to 29 years of age (78%), and for 60–69 years (83%). The prevalence of any HR-HPV in general population was the highest in women aged 30–39 (17%), and 70+ (20%). Stratified regression model in the general population showed that HR-HPV follows a pattern of an STI—it was significantly associated with a higher number of lifetime sex partners, and marital status. It was also associated with less recent gynecologist visit. HR-HPV in the colposcopy population was associated with a well-known factor for genital cancers – smoking.

Conclusions. We documented a high HR-HPV infection burden in Latvia. Any HR-HPV positivity was significantly associated with sexual and other health behavior, and healthcare-seeking factors.

FACTORS INFLUENCING INITIATION OF SUCCESSFUL EXCLUSIVE BREASTFEEDING IN MATERNITY DEPARTMENTS OF RIGA, LATVIA

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Objectives. Breast milk is an ideal nutrition for the growth, development of newborns and has many health benefits. The WHO recommends that infants should be exclusively breastfed for at least six months. Worldwide, about 800 000 newborn deaths have been linked to the late initiation of breastfeeding and lack of exclusive breast-feeding. Although exclusive breastfeeding is important for the health of mother, child, however, there are still gaps in the process of promoting exclusive breastfeeding. Therefore, it is crucial to understand what problems mothers face during the early lactation period.

Materials and Methods. This is an ongoing cross-sectional study conducted December 2022 – March 2023, based on questionnaire about socioeconomic situation, communication experience in OD, problems that are associated with exclusive breast-feeding. The study was approved by the Ethics Committee. The data were processed using IBM SPSS Statistics-27, comparing cases in different age-groups and different hospitals.

Results. 75% of women who evaluated their breastfeeding experience at the maternity department as unsatisfactory weren't informed enough about breastfeeding. Among women who had c-section 50% were well supported at the initiation of breastfeeding, while after vaginal birth – 63.2% were well supported. 25% of c-section mothers vs 5.3% of vaginal birth mothers were recommended to start milk formula without helping with breastfeeding. About 87% of women who were well informed about breastfeeding during pregnancy had a very good experience with breastfeeding initiation. The most common problem that affected initiation of breastfeeding was related to physical discomfort in 69% of cases.

Conclusions. The results show interaction between successful communication and initiation of breastfeeding. We want to develop better methods for eliminating disturbing factors. Questionnaire data showed that there is a problem in information sphere and women are not fully familiar with basic principles of breastfeeding. We plan to create informative materials that will be useful both for pregnant women and medical practitioner.

FACTORS THAT DETERMINE THE CHOICE OF LABOUR MANAGEMENT TACTICS IN PREGNANT WOMEN WITH A HISTORY OF CAESAREAN SECTION

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Objectives. Evaluate the outcome of childbirth in patients with a history of caesarean and find out the factors that determine the choice of labour management tactics in pregnant women with a history of operative delivery.

Materials and Methods. In the retrospective part of the study was analysed 131 birth histories of patients with a history of caesarean who entered in the Perinatal Care Center of Pauls Stradins Clinical University Hospital.

In the prospective part of the study were analysed 60 anonymous questionnaires, which were filled out by patients, who entered the maternity ward for operative/vaginal birth after one caesarean.

Results. The total number of births in the Perinatal Care Center in 2022(January 1-June 30) was 631 births—131(21%) patients had a history of caesarean. 101(77%) patients underwent a repeat caesarean. Vaginal delivery was initiated by 30 patients, of whom 17(57%) gave birth by natural delivery, while 13(43%) were completed by acute caesarean. There was a statistically significant relationship between birth outcome and gestational age and history of vaginal delivery($p < 0.05$). 22(58%) patients, who choose a repeated caesarean, haven't considered the possibility of trying to give birth vaginally, which is justified in 66% of cases by the fear of childbirth through natural birth routes and in 34% of cases by negative previous experience.

Conclusions.

1. Repeated operative delivery is the most frequent way of resolving delivery in patients with a history of caesarean(77% of cases).
2. There is a statistically significantly higher chance of a successful vaginal delivery for patients with a history of caesarean if the gestational age is < 40 weeks, and if the patient has had a history of vaginal birth($p < 0.05$).
3. The most frequent factor that would allow pregnant women with a history of caesarean to consider the possibility of trying to give birth vaginally is an individual estimate of the outcome of a successful vaginal birth(32% of cases).

GUILLAIN-BARRÉ SYNDROME IN PREGNANCY: CASE REPORT

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Objectives. Guillain-Barré syndrome (GBS) is a heterogeneous group of immune-mediated peripheral neuropathies, usually involving the myelin sheath of nerve fibres with diverse clinical manifestations.

Materials and Methods. Patient D., 34 years old, 33 weeks of gestation (w.g.), was admitted to the ICU complaining paresthesia in the lower and upper limbs; muscle pain; static disturbances; moderate headache; nausea; dizziness; general weakness, and pronounced fatigability.

Results. On admission, clinical exam revealed that the patient is conscious, has difficult nasal breathing; hyperemia on the pharynx; physiological course of pregnancy and fetal wellbeing. Paraclinical exam revealed no particularities. Complex examination showed physiological course of pregnancy and normal functional status of the fetus. The diagnosis was established: Pregnancy 33 w.g. Acute viral respiratory infection. Rhinopharyngitis. The management was performed according to the guidelines.

On the 3rd day of admission, the patient's dynamics was negative, with the association of diplopia-type visual disturbances on the background of normal blood pressure values. Neurological consult and neurography were recommended and the following diagnose was established: Acute inflammatory demyelinating polyradiculopathy (Guillain-Barré syndrome); moderate inferior flaccid paraparesis. Neuropathic algic syndrome. There was decided to initiate plasmapheresis and to monitor the current pregnancy with the performing of prophylaxis of RDS in the fetus. Owing to the negative dynamics of the patient's condition after corticosteroids, the administration was stopped.

On the background of the treatment, the neurological symptoms worsed in dynamics. Thus, after the council it was recommended to perform an emergency C-section, without particularities. The newborn's state was good. On the 8th postpartum day the patient was transferred to the specialized institution for further management.

Conclusions. GBS rarely occurs in pregnancy, but once present, it is associated with increased morbidity. Early diagnosis and active multidisciplinary management including plasmapheresis, as well as the appropriate timing and optimal mode of delivery is necessary to improve maternal and fetal outcomes.

INVASIVE PNEUMOCOCCAL DISEASE AND *S. PNEUMONIAE* CARRIAGE IN HOSPITALISED CHILDREN IN LATVIA 2018–2022

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Objectives. In 2018, 24 663 confirmed cases (6.4 cases per 100 000 population) of invasive pneumococcal disease (IPD) were reported in EU/EEA by 29 countries. Second highest rate were infants < 1-year (14.4 cases per 100 000). Ten most common serotypes – 8, 3, 19A, 22F, 12F, 9N, 15A, 10A, 23B, 6C (70% of typed isolates). For < 5-year-olds, 75% caused by serotype not included in pneumococcal conjugate vaccine (PCV). IPD caused by PCV13 serotypes declined from 88 cases per 100 000 in 1998 to 2 cases per 100 000 in 2019. In Latvia coverage of PCV is 86% in 2018 and 79.1% in 2020.

Materials and Methods. Study design – descriptive cross-sectional study. Inpatient statistical data 2018–2022 obtained from Children’s Clinical University Hospital’s (CCUH) “Andromeda” database. IPD data of Latvian paediatric population 2018–2022 obtained from Latvian Centre of Disease Prevention and Control (LCDPC). *S. pneumoniae* DNA obtained from nasopharyngeal and oropharyngeal swabs with further serotyping.

Results. In CCUH number of acute pneumonias in 2018–2019 were 1049 cases. Severe pneumonia 2.2% (23 cases), of which 8.7% (2) streptococcal. In 2020–2021 were 533 cases of acute pneumonia, 0.5% (3) were severe, 66.6% (2) of them pneumococcal. In 2022 was an increase with 446 acute pneumonia cases – 1.1% (5) severe (60% (3) pneumococcal). In 2018–2022 in CCUH 10 confirmed pneumococcal pneumonia cases. Serotyping done in 2 cases, respectively 23B and 19A.

In 2018–2022 LCDPC data show 18 cases of IPD. Majority 44% (8 cases) in 2020–2021. 33% (6) < 1-year-olds age and 67% (12) 1–5-year-olds. Serotypes identified in 83% cases. Most common 3 (16%) and 19A (16%).

Conclusions. Total number of pneumonia cases during COVID-19 pandemic decreased, however the number of pneumococcal pneumonia cases was the highest in 2020. Total number of IPD cases were evenly high in 2021 and 2022. Most commonly affected age group – children 1–5 years, who should be fully vaccinated against *S.pneumoniae*. The majority of identified are non-vaccine serotypes (3, 19A).

LABOUR INDUCTION – IS IT SAFE?

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Objectives. Induction of labour is a standard obstetric procedure and the quality and success of it depend on several parameters. There are some discussions on the safety of labour induction for high-risk pregnancies such as twins or vaginal breech birth. The aim of this study was to establish labour induction safety profiles for different patient groups.

Materials and Methods. This retrospective cohort study was conducted in Riga Maternity Hospital. It included 4264 pregnant women data from March 2017 till July 2022 with a singleton pregnancy, 102 and 369 women with a fetus in breech position. SPSS statistics performed descriptive and analytical statistics, level of significance was set at $p < 0.05$.

Results. Both nulliparous and multiparous singleton women had shorter time from the start of induction to the onset of labour and induction-to-delivery time in the combined method group. The incidence of uterine atony was higher in the induced twin group compared with the spontaneous onset of the twin labour group, 15.7% vs 4.3%, $p = 0.002$, and compared with induced singleton births (3.3%, $p = 0.0001$). From 369 women with breeches, 151 (40.9%) – had an acute cesarean section, 99 (26.8%) – had a planned cesarean section, and 119 (32.2%) had vaginal birth; the mean patient age was 30 years. There was no difference between the groups in the rates of chorioamnionitis, Caesarean section, the rates of hemotransfusion, uterine dysfunction, newborn Apgar score ≤ 6 after 1st min, and newborn admission to the Intensive care unit between the groups.

Conclusions. Labour induction is safe for all singletons, twins and breeches and their mothers if is conducted in an excellence centre by trained personnel.

METABOLOME AS A PREDICTIVE BIOMARKER OF OUTCOME OF INDUCTION OF LABOUR

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Objectives. The rate of induction of labour is increasing in last decades, with its main goal to decrease the maternal and neonatal morbidity and mortality. However, it is not a risk-free childbirth intervention. Multiple biomarkers are used to predict the outcome of labour induction, but yet none of these is 100% sensitive, and researchers continue looking for new and more sensitive biomarkers like metabolome.

Materials and Methods. The implementation of project “Role of Metabolome, Biomarkers and Ultrasound Parameters in Successful Labour Induction” was started in Rīga Maternity hospital in January 2021. The inclusion criteria were: healthy nulliparous women with singleton term pregnancy and cephalic presentation, with indication for labour induction, intact membranes and Bishop score 6 or less. Mass spectrometry metabolomics analysis was performed on blood samples collected from participants right before the labour induction. Labour induction was performed with combined method – Foley catheter and prostaglandin (*Misoprostol*) orally.

Results. There is limited number of studies about maternal metabolome during pregnancy and labour. One study showed that there was a difference in maternal metabolome in correlation to the onset of labour – spontaneous or induced. This suggests that in case of labour induction the activated pathway is different from that in spontaneous labour, and possibly could be associated with adverse pregnancy outcomes and unsuccessful labour induction. Results of our pilot study will be presented at ‘RSU Research week 2023’.

Conclusions. The maternal metabolome is a potential biomarker to predict the outcome of induction of labour.

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OBSTETRICIAN/GYNAECOLOGISTS' AND MIDWIVES' VIEW ON CAESAREAN SECTION BY MATERNAL REQUEST: HAS ANYTHING CHANGED OVER 17 YEARS?

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Objectives. We aimed to compare the opinions of Lithuanian obstetrician/gynaecologists (OB/GYN) and midwives about caesarean section (CS) by maternal request in 2004 and 2021.

Materials and Methods. Structured anonymous questionnaire was presented to OB/GYN and midwives. Two surveys were done at the time of 2004 and 2021. First survey was completed during national meetings (OB/GYN and midwives), the second one – online. Questions covered demographic data, personal birth experience, opinion about different birth types and CS by maternal request. Data was processed using SPSS 23.0.

Results. 321 respondents participated in the surveys: 130 (25 midwives, 105 OB/GYN) in 2004 and 191 (60 midwives, 131 OB/GYN) in 2021. Mean age of respondents was 44.0 ± 12.1 in 2004 and 46.9 ± 14.3 in 2021 ($p > 0.05$). Average working experience was 19.6 ± 11.8 years in 2004 and 21.7 ± 14.6 years in 2021 ($p > 0.05$). Main advantages of vaginal birth were: it is a natural process 86.9% (2004) vs 77.5% (2021), followed by closer mother-child bonding 54.6% (2004) and possibility to avoid complications of anaesthesia/surgery 63.4% (2021). Main advantages of CS were the elective daytime delivery 58.5% (2004), birth pain elimination 57.7% (2004) vs 43.5% (2021) and ability to minimise the risk of pelvic organ prolapse 41.9% (2021).

Compared to 2004, in 2021 fewer respondents believed that maternal request as an indication for CS should be legal, respectively 72 (55.4%) and 50 (26.2%) ($p < 0.05$). However, only 37 from 105 OB/GYN would agree to perform CS on demand (35.2%) in 2004 and 40 from 131 OB/GYN (30.5%) in 2021 ($p > 0.05$).

Conclusions. Main advantages of CS indicated by respondents, have slightly shifted from patients' convenience to possibility of avoiding natural birth related complications. The percentage of OB/GYN and midwives who support caesarean section by maternal request has decreased more than twice over the period of 17 years. However, agreement to perform CS on demand among OB/GYN remained the same.

OPTIC PATHWAY GLIOMA TREATMENT CHALLENGES OVER THE TIME – ONE INSTITUTION EXPERIENCE: CASE SERIES

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Objectives. To understand better the natural history of optic pathway glioma (OPG) in patients with neurofibromatosis type 1 (NF-1), and to evaluate the current recommended guidelines for monitoring and follow-up of OPG and the impact of chemotherapy in this population.

Materials and Methods. This retrospective case series included patient records of ophthalmological symptoms, MRI data, and chosen treatment method of OPG from the 2002–2022 year. Children younger than 18 years diagnosed with OPG were included in the study.

Results. In total, 56 patient medical records were conducted. OPG was diagnosed in 22 patients. Out of 22 patients with OPG 20 underwent the “watch and wait” strategy. 2 of the OPG patients underwent chemotherapy. In one of the cases, chemotherapy included vincristine alone, and in the second case initial cycle also included one-time administration of actinomycin D. Both patients presented with large spreading OPG. After chemotherapy tumor growth has significantly decreased allowing us to save the globe and not initiate surgical treatment or radiotherapy of the tumor

Conclusions. OPG is rare and difficult to treat tumor. Early recognition of present OPG and visual deterioration is crucial for the initiation of chemotherapy. Historically, radiation therapy was the treatment of choice for OPG, but it brought up severe complications including secondary tumors and Moya-Moya disease in patients with NF-1. Children with radiologically notable OPG must be evaluated by a multidisciplinary team – oncologist, ophthalmologist, and radiologist. In Latvia to achieve this kind of evaluation all children with NF-1 should be observed at Children's Clinical University Hospital.

PARENTS' KNOWLEDGE ABOUT FEVER IN CHILDREN

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Objectives. Fever is believed to be one of the most frequent symptoms in children and one of the main reasons why parents seek medical help for their children. Although there have been nationwide informational campaigns about treatment of fever, there is a noticeable misinformation about fever and fever phobia can be observed. The aim of the study was to investigate the knowledge, attitudes, and beliefs regarding fever in children among Latvian parents.

Materials and Methods. A descriptive cross-sectional study was carried out. The target audience was parents living in Latvia who have at least one child under the age of 18. A questionnaire was distributed in social portals during December 2022. The data was analysed using IBM SPSS program.

Results. A total of 327 valid answers were received. More than half of parents (63.9%) were confident in their knowledge about fever in children. However, only half of parents (53.5%) defined fever correctly as core temperature being $> 38^{\circ}\text{C}$. Only 16.5% ($n = 54$) believed that children need antipyretics even when their child had only fever and there were no other symptoms. Only 86.2% of parents would seek medical help if their child had fever and refused to drink and had no diuresis. Almost all respondents knew that fever can cause febrile seizures and dehydration. Although most parents also use non-pharmacological fever lowering methods, 10.1% of respondents use antipyretic drugs as the only mean to lower fever. When asked about the side effects of antipyretic drugs, 22.5% weren't informed about them. In case of insufficient effect of antipyretic drugs 19.6% parents would seek immediate medical help by going to the emergency unit or calling an ambulance.

Conclusions. The data supports the evidence that parents' knowledge about fever in children is insufficient and indicate need for more education and awareness about this topic to parents in Latvia.

PATIENT- AND FAMILY PHYSICIAN-RELATED PREDICTORS OF ANTIBIOTIC PRESCRIBING AND POINT-OF-CARE AND LABORATORY C REACTIVE PROTEIN TESTING BEFORE DECISION MAKING IN RURAL AND URBAN FAMILY PHYSICIAN PRACTICES IN LATVIA

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Objectives. Antibiotics are often prescribed for children with acute diseases in primary care, although viral infections are dominant. C reactive protein (CRP) is an acute phase protein that can help to differentiate viral and bacterial infections. We evaluate patient- and family physician (FP)-related predictors of antibiotic prescribing and CRP testing before antibiotic prescribing in FP groups with and without access to CRP point-of-care test (POCT).

Materials and Methods. 80 FP from from urban and rural practices in Latvia recorded data on pediatric patients (1 month up to 17 years) who were consulted with acute infections (symptoms duration < 5 days). The FP were divided into two groups of 40, one group had access to CRP POCT and control group continued standard care.

Results. In total, 2,039 children with acute infections were enrolled in the study (n = 886 in control group; n = 1153 CRP POCT group) with the median age 6.1 years. The most common infections were upper (78.3% (n = 1597)) and lower (18.8% (n = 384) respiratory infections. In both groups 29.8% received antibiotic prescription. Antibiotic prescribing was significantly associated with younger age of children, middle-age of FP, a rural location of the FP practice and a larger number of registered paediatric patients. The CRP level was frequently measured in the POCT CRP group (72.4% (n = 835)), compared to only 8.8% (n = 78) in the control group, with an especially low level in rural practices (0.9%). 79.4% of antibiotic prescriptions were preceded by CRP testing in the CRP POCT group compared to only 12.5% in the control group.

Conclusions. In the absence of CRP POCT, especially in rural areas, patients undergo minimal CRP testing prior to antibiotic prescribing, consequently leading to unwarranted antibacterial treatment. Younger age of children, middle-age of FP, a rural location of the FP practice and a more registered paediatric patients are associated with antibiotic prescribing.

PILOT PROJECT OF PLATELET-RICH FIBRIN MEMBRANE TYMPANOPLASTY

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Objectives. Introduction: Conventionally myringoplasty is a relatively long surgery requiring general anaesthesia. There is a need for faster and less invasive methods, especially in the pediatric praxis. Usually, the defect of the tympanic membrane is repaired with an autologous (cartilage, perichondrium or fascia) tissue patch. Platelet-rich fibrin (PRF) membrane tympanoplasty is a novel procedure with the potential to replace conventional myringoplasty. Objectives. Test and introduce a new tympanoplasty method in otorhinolaryngology.

Materials and Methods. We performed PRF tympanoplasty on 3 patients from Children Clinical University hospital with residual tympanic membrane perforation longer than 3 months after tympanostomy tube removal.

To make a PRF membrane, we use a Couchroun centrifuge and patented A-PRF vacutainers to get PRF membrane. A 20 mL blood sample from the patient was obtained and centrifuged in the A-PRF vacutainer for 14 minutes and then exposed to the PRF pressure box for 4 minutes. Then the myringoplasty procedure was done under general anaesthesia but without harvesting any additional tissues and avoiding other further cuts.

The total surgical time, full-time staying in the hospital, and the healing of the tympanic membrane after 2 weeks were registered and compared with average results from conventional tympanoplasty.

Results. From December 2022 till now – 3 patients – 2 girls, 1 boy. Mean age 7 years.

Average size of the defect < 25%. Length of the operation – 15 minutes. Hospitalization time – 4.1 hours. After the follow up in the one patient there was fully healed, in the one 50% improvement, in one without improvement.

Conclusions. The first results of PRF membrane tympanoplasty showed encouraging results suggesting the possible replacement of conventional tympanoplasty with the minimally invasive PRF graft procedure.

QUALITY OF LIFE AFTER TRANSOBTURATOR SLING PROCEDURE (TOT) FOR FEMALES WITH STRESS URINARY INCONTINENCE: SINGLE CENTRE EXPERIENCE, TWO-YEAR FOLLOW-UP

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Objectives. Urinary incontinence (UI) is defined as complaint of involuntary loss of urine. It is a widespread urological problem and It is significantly more common in females compared to males. UI significantly impacts patients quality of life, Most prevalent type of UI is Stress urinary incontinence (SUI), comprising approximately 50% of all UI cases. 18% of women experience severe SUI that can be treated only surgically. Mid-urethral slings are now the most frequently used surgical intervention in Europe for women with SUI. The aim of this paper is to study and describe the changes in the quality of life of patients after implantation of Mid-urethral transobturatorsling (TOT).

Materials and Methods. The study included 51 female patients who underwent implantation of TOT to treat stress urinary incontinence at Clinic of Urology and Urologic Oncology, Riga East Clinical University Hospital. from 2017 to 2019. The study group was analyzed, evaluating answers to pre-prepared questions characterizing the quality of life in relation to UI. The questions were selected from ICIQ-LUTSqol questionnaire, adding questions about satisfaction and social life. The results were evaluated to make conclusions about patients' quality of life after operation.

Results. All patients described SUI as very troubling before the operation. According to patients subjective evaluation, 92.2% felt improvement after the operation. Before the operation all patients used incontinence panties or pads to absorb urine; after the operation 88.2% of patients stopped using incontinence panties or pads. 76.5% of patients noted that their anxiety about urinary incontinence has decreased after the operation, 62.7% - that the quality of sleep has improved, 82.4% felt that their confidence has improved.

Conclusions. SUI is a serious urological problem significantly impacting the quality of life of patients. The results of this study show significant improvement in the quality of life of patients after implantation of TOT.

SEPSIS-ASSOCIATED BLOOD SAMPLING CAUSES SIGNIFICANT BLOOD LOSS IN NEONATES

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Objectives. Critically ill septic neonates are subjected to frequent diagnostic blood sampling which may result in anemia, especially in extremely low birth weight infants (ELBW < 1000 g). Our aim was to characterize volume of blood draws associated with healthcare-associated infection (HAI) in Neonatal intensive care unit (NICU).

Materials and Methods. We identified infants with culture-proven HAI among 954 neonates hospitalized at Children's clinical university hospital NICU from 2020 to 2022. We recorded number of blood draws during the first 10 days and a minimum amount of blood sampled, as required for laboratory analysis, was assumed. It was estimated that, on average, infants had a blood volume of 90 mL/kg body weight, based on previous reports.

Results. A total of 50 culture-proven HAI cases were identified. We excluded patients who died (n = 5) or developed another episode within 10 days of sepsis onset (n = 2). Of 43 eligible infants, median gestational age and birth weight were 28 weeks (range 23–41) and 1080 g (range 540–3890), respectively. Median volume of blood draws per infant was 9.3 mL/kg (range 1.7–34.6) and blood sampling resulted in a median 10.3% depletion of estimated circulating blood volume (range 1.9–38.5). Median phlebotomy blood loss in ELBW infants was higher 14.8 mL/kg (range 5.8–34.6) or 16.5% of blood volume (range 6.5–38.5).

Conclusions. Blood sampling causes significant loss of blood volume in NICU patients. Anemia treatment with adult red blood cell transfusions has been associated with adverse pulmonary, ocular, neurodevelopmental outcomes. Reducing transfusion needs requires new approaches for reducing laboratory blood loss. Non-invasive testing may prevent anemia and offer an opportunity to avoid transfusion-associated harm in this cohort [1].

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SHORT AND MID-TERM OUTCOMES OF MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C): PROSPECTIVE LONGITUDINAL COHORT STUDY

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Objectives. To determine short and mid-term outcomes of MIS-c in children.

Materials and Methods. Prospective longitudinal cohort study. Children under age of 18 years, fulfilling the Centers for Disease Prevention and Control (CDC) diagnostic criteria for MIS-c, and admitted to Children's Clinical University Hospital of Latvia (CCUH), between July 1, 2020, and April 15, 2022, were enrolled. All patients were evaluated at various time points: 2 weeks, 2 months (1–3 months), and 6 months (5–7 months) after MIS-c diagnosis.

Results. 21 patients with confirmed MIS-c were included. The median age of the study group was 6 years, (Interquartile range (IQR), 5–10 years; range, 1–16 years), 52.4% (N = 11) were girls. Only 71.4% (N = 15) of patients had confirmed SARS-CoV-2 infection (positive PCR test) prior MIS-c. At 2-week follow-up majority of complaints were associated with decreased physical activity – 10 children (47.6%) reported exercise intolerance with provoked tiredness, three children (14.3%) had difficulties to walk for more than 15 minutes or climb stairs. Laboratory tests showed increase in blood cell counts with a near doubling of leukocyte and neutrophil counts and tripling of thrombocyte levels. At 3 months follow-up 5 patients (23.8%) reported increased appetite and weight gain. 5 children (23.8%) still had physical activity provoked tiredness with only 2 children (9.5%) reporting decreased physical activity tolerance. 2 children (9.5%) had periodically prolonged elevated body temperature (up to 37.60 C) without any other complaints. Normalisation of all blood cell lines was seen in repeated testing. At 6 months visit 4 children (19%) still showed progressive weight gain, while 2 patients (9.5%) had decreased physical activity tolerance. Reduction in physical activity provoked tiredness was observed, comparing with 1–3 months follow-up. There were no pathological changes in repeatedly performed laboratory tests.

Conclusions. Abnormal clinical and laboratory findings were seen in patients 2 weeks after MIS-C with significant improvement in following weeks.

SUPRAVENTRICULAR TACHYCARDIA IN NEWBORNS IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL (2015–2020)

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Objectives. Analysis of data about newborn's supraventricular tachycardia (SVT) in Children's Clinical University Hospital (CCUH), the type of SVT mechanism, applied treatment, its duration and SVT complications.

Materials and Methods. This is a retrospective study. Research is comprised of data about newborns hospitalized to CCUH due to SVT from 2015 to 2020. Data was collected from CCUH patient's clinical histories and was analyzed by descriptive statistics methods. Patients were followed-up for 3 to 8 years.

Results. Out of total of 25 patients 21 (84%) were born in time and 4 (16%) were born premature. SVT mechanism's types used were: atrioventricular re-entrant tachycardia (AVRT) for 13 (52%) patients, atrioventricular nodal re-entrant tachycardia (AVNRT) for 4 (16%) patients, ectopic atrial tachycardia (EAT) for 5 (20%) patients and 3 (12%) patients had not differentiated SVT. Emergency treatment was applied to 2 (18%) with vagal maneuver, adenosine to 13 (52%) and cardioversion to 3 (12%) of total number of patients. Preventive therapy was administered to 24 (96%) of patients, out of them 13 (54%) used propranolol. 14 (56%) of patients received therapy until one year of age. On average, therapy was received until 11.6 ± 6.7 months of age. 9 (40.9%) of patients followed the same type of therapy from beginning until termination. SVT complications were observed in 3 (12%) of patients. Anatomical heart defect was diagnosed in 1 (4%) of newborns with SVT. Other congenital anomalies were in 2 (8%) of patients.

Conclusions. The most common SVT mechanism type is AVRT. The most frequent medical treatment was propranolol. Mostly, monotherapy for newborns with SVT is effective. Most patient's heart rhythm disorders disappeared until one year age. Complications are not common in newborns with SVT. A structural anatomical heart defect is a rare cause of SVT in newborns. SVT in newborns is not associated with other congenital anomalies.

THERAPEUTIC HYPOTHERMIA IN NEWBORNS BORN IN ASPHYXIA: EXPERIENCE IN THE LATVIAN BIGGEST PERINATAL CARE CENTER

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Objectives. Hypoxic-ischemic encephalopathy (HIE) among neonates is a significant cause of infant mortality and neurodevelopmental deficits. HIE can be as the result of perinatal asphyxia, which is related to fetal distress during labor and metabolic acidosis. Nowadays it has been proven that therapeutic hypothermia (TH) for moderate or severe HIE is beneficial. Systematic analyses of TH cases helps to identify the main antenatal and intranatal risk factors with a goal to improve the quality of care.

Materials and Methods. This retrospective study included all 35 neonates who were born in Riga Maternity hospital (RMH) with diagnosed HIE and received subsequent treatment using TH. Data were collected from hospital TH registry and medical records between 2020 and 2022. Delivery count RMH in 2020–2022 was 16164.

Results. Almost all newborns were born in acidosis – in umbilical cord venous blood median was pH 7.0; BE – 16.2, in arterial blood – pH 6.96; BE – 20.4. HIE grade on *Sarnatt* scale for one neonate was mild, while 27 and 7 neonates had moderate and severe HIE grades respectively. For 21 (60%) neonates were describe antenatal risk factors for birth complications. Only in 8 (22.9%) cases care assessment was optimal and situation was not preventable, but in many cases other management of labour could improve the outcome. The interpretation of cardiotocography (CTG) was revealed as the main problem: incorrect interpretation in 15 (43%) cases and no interpretation in 5 (14%) cases, what can lead to perinatal asphyxia. Hypoxic brain damage was found in 8 (22.9%) neonates, 27 (77%) neonates had a normal MRI result.

Conclusions. The CTG interpretation during delivery plays a leading role in labour for management and prevention of perinatal asphyxia. The systematic analysis of cases should be a part of quality insurance system in perinatal care institution and helps to avoid birth asphyxia cases and their complications.

TWIN LABOUR INDUCTION – IS IT SAFE?

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Objectives. Perinatal morbidity and mortality are increased in multifetal gestation. Often early delivery is indicated to improve perinatal outcome. The mode of delivery does not influence the perinatal outcome if the first twin is in cephalic presentation. This study aimed to investigate the efficacy and safety of induction of labour in twin pregnancies compared to spontaneous onset of twin births and induced singleton births.

Materials and Methods. This study included 102 induced twin pregnancy data from January 2017 till November 2022, with cervical readiness rating ≤ 6 points of the Bishop score and with foetuses after the 34⁺⁰ week of pregnancy. This group was compared with two control groups – 104 twin pregnancies with spontaneous onset of labour and 4262 induced singleton births.

Results. Caesarean section rate among primiparous women in the induced twin group was 32.7% vs spontaneous onset of twin birth 42.7% ($p = 0.294$) and vs induced singleton birth was 29.2% ($p = 0.582$); among multiparous in the induced twin group was 12% vs spontaneous onset of twin birth 27.2% ($p = 0.04$) and vs induced singleton birth was 6.3% ($p = 0.131$). The incidence of uterine atony was higher in the induced twin group compared with the spontaneous onset of the twin labour group, 15.7% vs 4.3%, $p = 0.002$, and compared with induced singleton births (3.3%, $p = 0.0001$). There was no difference in the rates of massive bleeding and hemotransfusion, uterine dysfunction, labour duration over 12 hours, newborn Apgar score ≤ 6 after 1st min and newborn admission to the Intensive care unit between induced twin group and spontaneous onset of twin births.

Conclusions. Twin induction does not increase the rate of caesarean sections, risk of blood transfusion and does not worsen the perinatal outcome. Twin induction increases the risk of uterine atony.

UNCOVERING IMMUNOLOGICAL BASIS OF POST-ACUTE SEQUELAE ASSOCIATED WITH SARS-COV-2 INFECTION IN CHILDREN

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Objectives. Children typically experience asymptomatic to mild SARS-CoV-2 infection, but some may develop persisting, potentially severe long-term symptoms, known as long COVID-19. The immunological mechanisms that may underlie this are still poorly understood, but emerging data implicate altered B cell activation and autoantibody production. Furthermore, whether unique immune profiles characterise the specific manifestations of long COVID-19 remains to be determined.

Materials and Methods. In this cross-sectional study of a paediatric population an online tool is used to conduct an initial screen for long COVID-19 following a laboratory-confirmed SARS-CoV-2 infection. Study participants that meet the long COVID-19 criteria are evaluated in person with the validated *International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC)* tool. Children that have fully recovered from acute SARS-CoV-2 infection are used as controls. The assessment of B cell activation is carried out by flow cytometry, using antibodies against CD19, CD27, IgD, IgM, CD21 and CD38, enabling the identification of transitional (IgM^{hi}CD38^{hi}), naïve (IgD⁺CD27⁻), switched (IgD⁻CD27⁺) and unswitched memory (IgD⁺CD27⁺), activated (CD21^{lo}CD38^{lo}) as well as double negative B cells (IgD⁻CD27⁻) and plasmablasts (IgM⁺CD38⁺⁺). Anti-nuclear antibody measurements in serum are used as a further readout for dysregulated B cell activation.

Results. A total of 220 children (under 18 years old) with long COVID-19 have been identified with the online screening tool. For long COVID-19, the most frequent symptoms reported are exercise intolerance (56.6%), fatigue (52%) and mood swings (50%). Our preliminary B cell profiling (8 long COVID-19 and 4 controls) reveals a trend for IgM-CD38⁺⁺ plasmablast expansion.

Conclusions. The pipeline established through this study has enabled the identification of study participants with a range of long COVID-19 manifestations. Further in-depth analysis of B cell activation pathways in this well-characterised paediatric cohort will allow us to delineate how B cell dysregulation may contribute to the range of post-acute SARS-CoV-2 sequelae.

VALIDATION OF THE CHILDBIRTH EXPERIENCE QUESTIONNAIRE (CEQ) IN LATVIA

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Objectives. Childbirth Experience Questionnaire (CEQ) was validated within the project “Role of Metabolome, Biomarkers and Ultrasound Parameters in Successful Labour Induction” in Riga Maternity hospital. This study aims to assess the correlation between women’s perceptions of first-child labour experience and the birth outcome.

Materials and Methods. A 22 item – questionnaire was adapted, translated, and validated from CEQ. Revised questionnaire was given to 60 women at the day of discharge and asked to fill it out 3 weeks postpartum. Survey was carried out from March to June 2022. For statistical analysis Kruskal-Wallis test and Mann-Whitney U test were used. Data were analysed by IBM SPSS, 24.0.

Results. 41 primiparous women (68.3% response rate) undergoing induction of labour at term delivery voluntarily answered the questionnaire. All items were analysed in four scales – own capacity (8 items), professional support (5 items), perceived safety (6 items), participation (3 items). Cronbach’s alpha coefficients were acceptable for group analyses (> 0.70) in all scales. By comparing mean scores statistically significant difference was found between women who underwent spontaneous vaginal delivery (mean value 2.52; SD = 0.53) and instrumental vaginal delivery (1.71; SD = 0.42) in own capacity scale ($p = 0.035$), and perceived safety scale ($p = 0.048$), mean values 3.11 (SD = 0.55) versus 2.2 (SD = 0.71). Women who underwent episiotomy during labour scored significantly lower in own capacity scale ($p = 0.017$) comparing to those who did not experience episiotomy (mean value 1.91(SD = 0.60) vs 2.50(SD = 0.51). Patients who had a contract with midwife scored significantly higher ($p = 0.048$) in professional support scale, mean values 3.82(SD = 0.46) vs 3.41(SD = 0.61).

Conclusions. CEQ is valid and reliable measure of childbirth experience in Latvia. The results of this pilot study show valuable information about childbirth experience and stress the main points of concern.

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VALIDATION OF THE SHORT FORM OF QUALITY FROM THE PATIENT'S PERSPECTIVE (SQPP) QUESTIONNAIRE

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Objectives. The questionnaire (QPP) was validated within the framework of a study project as a tool to evaluate the role of psycho-emotional factors in prediction of successful labour induction, apart from other factors such as biological biomarkers, ultrasound parameters, and metabolome. The aim is to compare the adapted perceived reality scale of the sQPP questionnaire with standard data.

Materials and Methods. The translation and adaptation of questionnaire was performed according to Rīga Stradiņš University approved methodology. 50 healthy primiparas with induced labour were given the questionnaire and gave informed consent to participate in the study

on the day of discharge. On this evaluation, a four-point Likert scale ranging from 1 (Don't agree at all) to 4 (Completely agree) is used. Pearson Correlations were computed between the study and standard data. Differences in means between the two versions were analysed with t-tests. Significance defined if $p < 0.05$. Statistical analysis was carried out using IBM SPSS 24.0 software.

Results. 50 females were enrolled into the validation process. Correlations between the two sQPP data are statistically significant ($p < 0.05$). Difference between means is noted on all of the selected scale items. The strongest correlation was for the indicator that doctors ($r = 0.78$, $p = 0.000$) and midwives ($r = 0.73$, $p = 0.000$) seemed to understand how patient experienced situation. Strong correlation was also found for indicator "receiving useful information on which doctors were responsible for patient's medical care" ($r = 0.75$, $p = 0.000$), giving one of the highest mean scores per item in the study data ($M = 2.02$, $SD = 1.05$).

Conclusions. Correlations of acceptable size between the two sQPP were found. The validated questionnaire will be further used as a part of the study.

Acknowledgements. This research is funded by the Latvian Council of Science project "Role of Metabolome, Biomarkers and Ultrasound Parameters in Successful Labour Induction", project No. lzp-2021/1-0300.

WOMEN'S SUGGESTIONS ON HOW TO IMPROVE THE QUALITY OF BREASTFEEDING AND SUPPORT AT THE HOSPITAL: QUALITATIVE STUDY IN LATVIA USING THE WHO STANDARDS AS FRAMEWORK FOR ANALYSIS

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Objectives. Breastfeeding is widely recognized as the optimal form of nutrition for newborns, has many benefits for the mother, including the release of hormones that promote bonding, and may reduce the risk of certain diseases. Despite these benefits, breastfeeding rates vary widely around the world and are influenced by a variety of factors and the support received from the hospital. This study aimed to explore suggestions from Latvian women who recently delivered in a hospital on how to improve breastfeeding support based on WHO Quality of maternal and newborn care (QMNC) questionnaire.

Materials and Methods. Between March 1, 2020 to October 28, 2021, a questionnaire with open-ended questions was administered to mothers who gave birth at healthcare facilities in order to gather suggestions for improving the quality of maternal and newborn care. Responses were analysed using thematic analysis, with the WHO Standards for improving the QMNC serving as a framework for the analysis. The responses were grouped into 16 key recommendations. This study processed data on breastfeeding recommendations.

Results. 597 mothers provided a total of 530 comments and 663 suggestions on how to improve the QMNC. 72 (10.9%) of them made suggestions about breastfeeding. 30 (28.8%) women suggested “provide full-time breast-feeding consultant in the hospital”, 16 (15.4%) stated that “doctors and midwives should improve their breast-feeding knowledge”, 9 (8.7%) “did not receive sufficient information on the benefits of exclusive feeding”, 28 (26.9%) “wants more support and encouragement”, 7 (6.7%) “to obligatory receive breastfeeding counselling for each mother”, 10 (9.6%) mentioned that regular feedback about “effectiveness of breastfeeding” might be supportive. Four women expressed their opinion of providing with nursing chair and not judging the mother for her feeding choices.

Conclusions. Gathering feedback from women on ways to enhance QMNC after giving birth in the hospital revealed important suggestions for areas of care that should be improved according to patients' perspectives. Education of medical staff and continuous support for evidence-based breastfeeding principles should be included in hospital policies.

WOMEN'S SUGGESTIONS RELATED TO EXPERIENCE OF CARE: QUALITATIVE STUDY IN LATVIA USING WHO STANDARDS AS A FRAMEWORK FOR ANALYSIS

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Objectives. Quality of maternal and newborn care (QMNC) is identified as a significant predictor of maternal and newborn health outcomes in the World Health Organization (WHO) policy framework and strategy for the European Region. As a result of the resonance in the public media with verbal and emotional abuse in recent years during childbirth, it is crucial to analyse and objectivise opinions and identify the factors that have led to this type of situation.

Materials and Methods. A qualitative study was conducted as part of IMAgiNE EURO project. 2079 women who gave birth in healthcare facilities in Latvia from March 1, 2020, to October 28, 2021, were included in the analysis and answered an online questionnaire based on WHO standards, including open-ended questions related to the experience of care during childbirth. One author independently used thematic analysis to analyse women's comments, using the WHO Standards for improving QMNC as a framework for the analysis.

Results. Overall, 530 mothers commented on improving QMNC, and 33.58% (N = 178) women made 229 suggestions pertinent to the "experience of care". The suggestions were divided into several groups, and the top five were: 1) increase empathy, emotional support, active listening, sensitive and respectful attitude (33.19% of suggestions, N = 76); 2) avoidance of verbal abuse, such as yelling, rudeness, ridicule, reproaches, talking behind the back (22.27%, N = 51); 3) the reasons of interventions and possible outcomes are clearly explained (21.40%, N = 49); 4) avoidance of express dissatisfaction with being disturbed or being asked for help (7.42%, N = 17); 5) improve effective communication, coordinated care and common views on the necessary actions among health professionals (3.93%, N = 9).

Conclusions. Key aspects of the experience of care can be defined as respectful and empathic behavior, without passive-aggressive or aggressive humiliation of women, and improvements in these aspects would not leave women with traumatic birth experiences.

SOCIAL SUPPORT AND POSTPARTUM DEPRESSION IN LATVIA

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Keywords. Social support; Postpartum depression

Objectives. The aim of this study was to find the association between perceived level of social support for women in Latvia, socio-demographic factors and depression symptom severity in postpartum period.

Materials and Methods. A cross-sectional study of women who had given birth in the last 2 years was done using an online anonymous survey. The survey included questions about sociodemographic factors, rating of perceived social support on a scale from 1 to 5 and Edinburgh postnatal depression scale (EPDS), which includes 10 questions about most common postpartum depression symptoms. Cut-off score of 11 was used for major depression. The survey was published in different online parenting forums.

Results. From 200 participants, 63 (31.5%) had major depression based on the EPDS. Only 17.5% of all women have used a depression symptom self assessment score after birth. Married women had depression statistically significantly less than single women and women in relationships ($p < 0.05$). Women who had not been diagnosed with depression previously, scored significantly less on the EPDS than women with previous depression (median score 7.5 (4.25–11.75; Q1–Q3) vs. 11.0 (5.5–17.0; Q1–Q3); $p < 0.05$). All social support factors had changed statistically significantly after the birth of their child ($p < 0.001$). Women who rated their social support higher scored lower on EPDS. Almost one fourth of women noted they need more support from their gynaecologist and other health care specialists. The EPDS score was significantly higher for women who rated their support as not enough from their partner, family and relatives, friends ($p < 0.001$) and their Gynaecologist ($p = 0.003$).

Conclusions. Women in Latvia perceive their overall social support as good, but giving birth significantly negatively affects social status. Many women noted that their support from health care specialists is not enough and is associated with higher EPDS score. There is a statistically significant correlation between the EPDS score and Social support.

AASSOCIATION BETWEEN INTIMATE PARTNER VIOLENCE AND PREGNANCY TERMINATION IN RIGA EAST CLINICAL UNIVERSITY HOSPITAL

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Keywords. Abortion; Intimate partner violence; Pregnancy termination

Objectives. Previous studies had shown that women who experience intimate partner violence (IPV) more often have unintended pregnancies and terminate them. The aim of this study was to evaluate the association between experiencing intimate partner violence and repeat abortion in women seeking pregnancy termination.

Materials and Methods. An analytic, cross-sectional study of women aged 16 to 45 years who had an induced abortion in Riga East Clinical University hospital from April 2022 to January 2023. The data on sociodemographic, sexual health, and IPV was conducted from an anonymous, self-completed questionnaire (in Latvian or Russian), and was compared between first and repeat pregnancy termination, IPV exposed and unexposed study groups to assess the association using Chi-square test. P-value < 0.05 was considered statistically significant. The study was approved by the Ethics Committee of Rīga Stradiņš University.

Results. A total of 56 respondents were included, of whom 26.8% (n = 15) reported a previous termination of pregnancy. The prevalence of IPV experienced in the last 12 months preceding the survey was 35.7%, without statistically significant differences between women having their first (39.0%) or repeat pregnancy termination (26.7%). In addition, there were no differences comparing different violence types between groups. Past-year prevalence of physical violence was 17.9%, sexual 3.6%, and emotional 32.7%. Women exposed to IPV more often had dyspareunia, previous history of any type of violence (intimate partner, other people, physical, sexual, or emotional), and had ever used effective contraceptive methods.

Conclusions. Women who terminate pregnancy experience high IPV rates. Repeat termination of pregnancy is not related to a higher prevalence of any type of IPV. The previous history of any type of violence during the lifetime makes women more vulnerable to experience IPV in the last 12 months.

PERINATAL OUTCOME OF TERM BREECH SINGLETON DELIVERIES IN RIGA MATERNITY HOSPITAL FROM 2017 TO 2019

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Keywords. Breech delivery; Perinatal outcome; Delivery method

Objectives. Vaginal breech birth is associated with an increased neonatal morbidity and mortality compared with vaginal birth of cephalic presentation. The type of breech birth delivery is controversial between various scientific sources. However the routine to deliver term breech cases by planned cesarean section has been debatable due to the risk of maternal and neonatal complications. Some clinicians support vaginal breech birth in selected cases, carefully evaluating the criteria. The aim of this study was to compare neonatal outcome in acute cesarean section, planned cesarean section and vaginal birth in case of breech presentation.

Materials and Methods. This retrospective study was performed using data from Riga Maternity Hospital and included 369 women presenting with term breech singleton pregnancy from 2017 to 2019. The data was processed using IBM SPSS Statistics version 28, comparing perinatal outcomes in three groups: acute cesarean section, planned cesarean section, vaginal birth. Perinatal outcome was analyzed by 1st minute and 5th minute Apgar score, admission to Neonatal Intensive Care Unit (NICU) and whether the newborn was discharged home or to the hospital.

Results. From 369 women, 151 (40.9%) – acute cesarean section, 99 (26.8%) – planned cesarean section, 119 (32.2%) vaginal birth; mean patient age was 30 years. There was no statistical significance in the 5th minute Apgar score, admission to NICU and newborn discharging between three delivery method groups. The only statistical significance was observed in the 1st minute Apgar score between vaginal birth and planned cesarean section ($p \leq 0.001$).

Conclusions. In this study vaginal breech birth's perinatal outcome did not differ from cesarean section's perinatal outcome in most of the parameters. With careful patient evaluation and with a well-trained perinatal center staff there could be recommended vaginal breech delivery.

TRIAL OF LABOUR AFTER ONE CAESAREAN SECTION

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Keywords. TOLAC; Caesarean section; Vaginal birth

Objectives. To evaluate the outcomes of pregnancy and delivery in women with one previous caesarean section (CS) who underwent trial of labour.

Materials and Methods. A retrospective study was conducted at Department of Obstetrics and Gynecology of Lithuanian University of Health Sciences on 309 women with one previous caesarean section fulfilling the criteria for trial of labour in 2021. Women were divided into two groups according to outcome of trial of labour: 187 women had successful vaginal birth (Group I) and 121 women had urgent caesarean section after trial of labor (Group II). Pregnancy and delivery outcomes were compared between two groups. Data analyzed using IBM Statistics SPSS for frequencies, T and χ^2 tests. Results with values of $p < 0.05$ considered statistically significant.

Results. 60.7% of women had successful vaginal birth after one prior previous CS (VBAC). Women in Group I more often had a vaginal birth before prior CS ($p = 0.008$). Gestational hypertension ($p = 0.047$), preeclampsia with severe features ($p = 0.022$), placental abruption ($p = 0.007$) and COVID-19 infection ($p = 0.043$) during labour were more common in Group II. Amniotomy ($p = 0.004$) and epidural anesthesia ($p = 0.028$) were more often performed in Group I. The average duration of the second stage of labour and total labour duration were longer in Group II ($p = 0.027$ and $p = 0.007$). Repeated labour dystocia was more often diagnosed in Group II ($p = 0.0001$). Newborns in Group I had higher Apgar scores ($p = 0.001$ and $p = 0.003$). Fetal macrosomia ($p = 0.014$) and preterm birth ($p = 0.034$) were more common in Group II.

Conclusions. Women with a history of vaginal delivery before previous CS have higher chances of successful outcome of trial of labour. Placental abruption, fetal macrosomia and preterm birth are significantly associated with urgent caesarean section after the trial of labour in women with previous CS.

COULD INDIVIDUAL CARE BIRTH CONTRACT IMPROVE SATISFACTION WITH CHILDBIRTH?

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Keywords. Labour; Satisfaction with childbirth; Individual care birth contract.

Objectives. The experience of giving birth has long-term implications for a woman's health and welfare. Latvian childbirth experience has two care models: national health care and commercial individual care contract. The aim of the study is to understand if there is any difference in satisfaction in birth process between women who had contract for individual care birth and those who did not.

Materials and Methods. An online questionnaire was managed from October to December 2022 for women who gave birth in Latvian hospitals from 2017 to 2022. The questionnaire included questions about satisfaction of work of medical staff, communication level, awareness, birth process, rating it on a scale from 1 to 5, where 1—completely unsatisfied, 5—completely satisfied. Data were summarized and analyzed using MS Excel and SPSS program.

Results. The study involved 7434 women living in Latvia, of whom 1173 had a contract with a midwife and 6170 did not. 90% of women who did not have a contract and only 9% who had, experienced passive aggression from medical staff or midwife. There is no difference in birth satisfaction, baby's condition after giving birth, support and trust from the midwife, explanation of the need for medical manipulations between women with and without contract. Women who have a contract are more satisfied with the awareness of the course of birth process and on a scale of 1 to 5, more likely to score 4; women without a contract are more dissatisfied, give a score of 2.

Conclusions. There is no significant difference between satisfaction with maternity care for women with and without individual care birth contract. Women with contract less often suffer provider passive aggression and gets more information on birth process. A contract with midwife improves patient-centred care and this should be made standard practice for all women.

SELF-ESTEEM AND ANXIETY IN POSTPARTUM LITHUANIAN WOMEN

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Keywords. Perinatal anxiety; Postpartum; Self-esteem

Objectives. We aimed to examine the relationship between self-esteem and anxiety in women who have given birth using the Perinatal Anxiety Screening Scale (PASS).

Materials and Methods. An online survey was conducted in Lithuania, from August to October 2022. The study analyzed 221 women who gave birth within previous year and filled the structured anonymous questionnaire. All women were divided into 3 groups based on the PASS scores: group 1 – asymptomatic women (0–20 points), group 2 – mild-moderate postnatal anxiety symptoms (21–41 points), group 3 – severe symptoms (42–93 points). Self-esteem was measured by Rosenberg self-esteem scale: 0–15 points indicated low self-esteem, more than 15 – moderate and high self-esteem. Other data included demographic characteristics, gestational age, mode of birth, parity and breastfeeding. Statistical analysis was performed using the data collection with IBM SPSS 27.0.

Results. Overall 79 women (35.7%) were asymptomatic (group 1), 92 women (41.6%) reported mild-moderate anxiety (group 2) and 50 (22.6%) – severe anxiety symptoms (group 3). The majority of women (95.5%) gave birth within previous six months, 70.6% – within previous three months. The mean age of women was 30.1 ± 5.0 years and did not differ between study groups ($p = 0.144$). There was no significant difference in terms of marital status ($p = 0.624$), education ($p = 0.187$), parity ($p = 0.430$), gestational age (0.432) or mode of birth ($p = 0.890$). Women with severe anxiety symptoms were less likely to breastfeed (56%) when compared with other groups (78.5 and 78.3%, $p = 0.007$). Low self-esteem was identified for 2 women (2.5%) in group 1, 11 women (12.0%) in group 2 and 18 women (36.0%) in group 3. Women with severe anxiety symptoms (group 3) had low self-esteem more frequently when compared with asymptomatic women ($p < 0.001$).

Conclusions. Almost two thirds (64.2%) of postpartum women reported anxiety symptoms. Women with severe anxiety symptoms had low self-esteem more frequently.

EVALUATING THE POTENTIAL OF TELEMEDICINE IN GYNECOLOGICAL CARE IN LATVIA: AN ANALYSIS OF BENEFITS AND LIMITATIONS

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Keywords. Telemedicine; Benefits; Limitations

Objectives. The COVID-19 pandemic has highlighted the importance of telemedicine as a necessary alternative mode of healthcare delivery, especially during periods of reduced in-person healthcare availability. Despite the increasing demand for telemedicine services in Latvia, research on patient preferences for telemedicine is limited. This study aims to investigate women's knowledge and perceptions of the benefits and limitations of telemedicine in Latvia.

Materials and Methods. The current study employed a survey methodology to examine the demographic information and perceptions of the benefits and limitations of telemedicine among 112 respondents. The survey was distributed electronically and data was collected in accordance with the guidelines set by the Riga Stradins University's Ethics Committee.

Results. The study included women with an average age of 35.5 (± 12.2) years. Of these participants, 77.7% ($n = 87$) reported not having any gynecological pathology, while 17.0% ($n = 18$) reported having benign gynecological disease. The primary benefits of telemedicine cited by patients included reduced transportation costs 42.9% ($n = 48$), decreased time spent traveling to the doctor's office 57.1% ($n = 64$), and reduced costs for doctor's consultation 33.9% ($n = 38$). The main disadvantage as identified by 61.6% ($n = 69$) of patients was a concern that doctors would not be able to fully understand their complaints. The statistical analysis revealed a significant correlation between telemedicine usage in younger patients and a lack of comprehension of physician recommendations ($p < 0.05$). This highlights the need for enhanced communication during telemedicine to ensure patient understanding. No significant correlation was found between a patient having a gynecological disease and their use of telemedicine.

Conclusions. The study found that Latvian women patients cited cost savings and time savings as the main benefits of telemedicine. However, they also expressed concerns that doctors might not fully understand their complaints through telemedicine. These findings suggest that while telemedicine has potential benefits, it also raises some concerns that need to be addressed in future research.

TELEMEDICINE IN GYNECOLOGY: AN EXPLORATION OF WOMEN'S ATTITUDES AND EXPERIENCES IN LATVIA

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Keywords. Telemedicine; Attitudes; Experiences

Objectives. The COVID-19 pandemic has led to the rapid integration of telemedicine services in various medical specialties, including gynecology. While telemedicine has been shown to be effective in certain conditions, there is currently a lack of research on the acceptance and satisfaction of gynecology patients receiving care through telemedicine methods. The aim of this study is to explore the attitudes and experiences of women receiving gynecological care through telemedicine methods in Latvia.

Materials and Methods. A quantitative cross-sectional study was conducted from October 2022 to January 2023. The questionnaire consisted of fields: socio-demographic information, experiences with telemedicine methods, and attitudes towards telemedicine methods. The questionnaire was distributed electronically via social media. Data were analyzed using SPSS.

Results. 112 Latvian women participated in the study, the mean age was 35.5 (\pm 12.2) years, with 68.8% (n = 77) living in Riga and 31.2% (n = 35) living in other cities. 75% (n = 84) of the women reported visiting a gynecologist once a year. 88.4% (n = 99) of the women reported having heard about telemedicine methods and 44.6% (n = 50) reported having used them, with 30.4% (n = 34) starting to use telemedicine methods during the COVID-19 pandemic. The most common method used was teleconsultation (58%, n = 65). The most frequent reason for the visit was a consultation about health status (38.4%, n = 43), followed by therapy correction (17.9%, n = 20). Findings indicate that there is no statistically significant association between place of residence and utilization of telemedicine services, as determined by chi-square analysis ($p > 0.05$). Overall, 83.9% (n = 94) of the women reported thinking that telemedicine services were useful.

Conclusions. The study found that telemedicine is a well-accepted method for delivering gynecological care in Latvia and the majority of women think it is useful. However, this study has a small sample size and further research with larger samples is needed to confirm these findings.

FREQUENCY OF PHYSICAL ACTIVITIES DURING PREGNANCY IN LATVIA

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Keywords. Physical activity; Pregnancy; Recommendations

Objectives. WHO's recommendations for pregnant women without contraindication- 150 minutes of moderate-intensity aerobic physical activities a week. The aim of the study was to find out the frequency of physical activities of pregnant women and evaluate whether in Latvian population physical activities are in sufficient quantity.

Materials and Methods. From September 5th until October 25th, a survey was published, and it included questions about physical activities. In the survey participated 295 pregnant and postpartum women.

Results. The weight was ranged from 49 kg to 105 kg, height from 165 cm to 181 cm, age from 17 to 44 years. In the question of how many times a week you engage in physical activities, 34.9% answered 1–2 times a week, 22.7% 2–3 times a week, 16.6% 3–4 times a week, 11.9% 4–6 times a week, 3.1% more than 6 times a week, but 10.8% do not participate. In the question what kind of physical activities you do, 86.8% answered walking, 21.4% exercising with a coach, 19% individual exercise, 16.3% water aerobics, 8.1% yoga, 2.1% swimming, and 6.1% do not participate at all. 89.2% of respondents engage in physical activities at least once a week or more often, while 10.8% do not engage in physical activities at all. Only 15% engage in physical activity in a sufficient level 150 minutes a week.

Conclusions. There is an insufficient amount of physical activities in the Latvian population, most of the women do not engage in physical activities enough. To achieve benefits of the physical activities, women should strive for WHO's recommendations and engage in physical activities more often.

AWARENESS OF SAFE PHYSICAL ACTIVITIES DURING PREGNANCY IN LATVIA

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Keywords. Safe physical activities; Pregnancy

Objectives. During pregnancy, it is recommended to engage in light or medium-intensity physical activities, and it's important to do sports in a safe environment to avoid trauma.

The aim of the study was to find if women are aware of which physical activities are safe during pregnancy and which should be avoided.

Materials and Methods. From September 5th until October 25th, a survey was published, and it included questions about opinion which activities are considered unsafe. In the survey participated 295 pregnant and postpartum women.

Results. The weight was ranged from 49 kg to 105 kg, height from 165 cm to 181 cm, age from 17 to 44 years. In the question of whether you know what physical activities should not engage in, 55.6% answered yes, 29.2% are not sure, 15.3% answered no. In question of what physical activities are unsafe, 94.2% answered activities with high risk of traumatism, 85.4% weightlifting, 76.9% high intensity workouts, 31.9% running, 65.4% jumping, and 0.7% cycling. In the question who informed about unsafe activities, 62% answered social media, 44.7% midwife or a doctor, 17.6% books and 13.6% are not informed. 44.4% admit that they are either not sure or do not know which physical activities are unsafe.

Conclusions. Latvian population women are not sufficiently informed, almost half of the respondents do not know or are not sure which activities are safe.

About half of the respondents were not informed by healthcare specialists about safe physical activities which indicates that it would be necessary to emphasize this information more to reduce traumatism risks and encourage women to engage in safe activities.

VITAMIN D STATUS AND EFFECT ON BLOOD PRESSURE IN PREGNANT WOMEN IN LATVIA

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Keywords. Hypertension; Maternal health; Pregnancy; Vitamin D

Objectives. Vitamin D insufficiency is widespread in pregnant women and it has been associated with the risk of hypertensive disorders during pregnancy. There is a debate as to whether serum vitamin D level impacts blood pressure.

Materials and Methods. The study has been implemented within the Latvian Council of Sciences project Nr.lzp-2019/1-0335. This cross-sectional study included 305 women up to the 7th day post-partum and pregnant in 8 hospitals from various regions of Latvia who consented to a face-to-face interview using a questionnaire on nutrition and lifestyle from July 2020 to December 2022. Blood samples were taken to measure serum vitamin D 25(OH) levels. IBM SPSS was used to analyze the data.

Results. Only 51.80% (n = 158) of the respondents reached the recommended optimal recommended vitamin D level (at least 30 ng/mL). 42.62% (n = 130) denied the use of vitamin D3 supplementation (at least 1000 IU/day), and 29.51% (n = 90) consumed 1000 IU/day or less each day during the last half year before delivery. Totally 8.85% (n = 27) of all women have had at least one episode of elevated blood pressure (BP) (> 140/90) during pregnancy. They had a mean vitamin D level of 30.68 ng/mL (SD ± 12.48), while for the rest of the women a mean level of 32.37 ng/mL (SD ± 13.84) (range, 8.0 to 91.3 ng/mL), but no statistically significant differences between the vitamin D level and both groups were found (U = 3442.0, p = 0.571).

Conclusions. Almost half of the women had insufficient serum vitamin D levels, and more than two thirds of the women did not use vitamin D3 supplementation at all or below 1000 IU/day. The mean serum vitamin D level for women with at least one elevated BP episode could be assumed to be slightly lower than for the rest of the women.

COMPARISON OF HYGIENE HABITS IN WOMEN OF REPRODUCTIVE AGE WITH NORMAL MENSTRUAL CYCLE AND AMENORRHEA

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Keywords. Hygiene; Reproductive age; Amenorrhea; Normal menstrual cycle.

Objectives. Woman's everyday life includes very important aspect of life – correct intimate hygiene. Inappropriate hygiene habits can disrupt the vaginal microflora and microflora of the external genitalia. Additional factors, which can affect normal microflora of the genitals, include regularity of menstrual cycle, and causes of a menstrual cycle irregularity. The aim of this study was to compare hygiene habits in women of reproductive age with normal menstrual cycle to women with amenorrhea.

Materials and Methods. A total 191 women in reproductive age were enrolled in research. 149 women with normal menstrual cycle and 42 with amenorrhea have filled questionnaire about their hygiene habits. Survey was presented in Latvian and Russian. Questionnaires were posted on social media such as Facebook and Instagram and sent to schools from April 2022 till August 2022. This research was approved by the Ethics Committee of RSU.

Results. The main cause of amenorrhea was levonorgestrel intrauterine device (38.1%). Breastfeeding was in the second place (21.4%) and in the third place – polycystic ovary syndrome (11.9%). Women in both groups mostly take shower every day (64%). 69% of women with amenorrhea compared with 44.3% women with normal menstrual cycle with statistically significant difference ($p = 0.005$) choose specialized intimate hygiene products. 34.9% of women with normal menstrual cycle choose shower gel for intimate hygiene ($p = 0.013$). Women in both groups mainly choose cotton underwear (93–100%). However, women with amenorrhea in 45.2% of cases have chosen bamboo underpants ($p < 0.001$) while women with normal menstrual cycle in 40.3% of cases have chosen polyester underwear ($p = 0.005$).

Conclusions. Women with amenorrhea mainly choose specialized intimate hygiene products for shower, meanwhile, women with normal menstrual cycle use shower gel. Tendency to choose appropriate material underwear was found among women with amenorrhea.

SELF-CARE CHALLENGES AND OPPORTUNITIES DURING PREGNANCY

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Keywords. Self-care interventions; Pregnancy; Guidelines; Barriers; Self-management; Self-testing; Self-awareness

Objectives. The WHO (World Health Organization) promotes self-care interventions during pregnancy as one of the tools to obtain a positive pregnancy experience. There are different options for self-care interventions which fall under self-management, self-testing and self-awareness which are beneficial to the pregnant individuals. At the same time there are challenges in the implementation of these recommendations.

The aim of this literature review is to give an overview of the existing options in self-care during pregnancy, future opportunities, challenges to self-care implementation, options to address the barriers and the benefits that these interventions bring.

Materials and Methods. An internet-guided literature search was conducted in 2022 using both Google and Mendeley to retrieve links to corresponding articles and documents. The most used databases were the WHO library, Elsevier, PubMed, MBI, and the Cochrane Library. Documents in both Italian and English were evaluated and the most relevant and recent were chosen. 85 papers, documents, and scientific publications were used to complete this literature review.

Results. Different self-care interventions during pregnancy have been proven to be efficient in improving the pregnancy experience for pregnant patients. The barriers to their implementations are clear and evident and possible solutions were proposed.

Conclusions. Self-care interventions during pregnancy are important tools which carry a great deal of benefit and are to become of an even greater importance within the healthcare system. Their implementation is undermined by many challenges and barriers that need to be faced and corrected.

THE IMPACT OF MATERNAL OBESITY ON OBSTETRIC AND NEONATAL OUTCOMES

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Keywords. Pregnancy; Obesity; Cesarean section; Neonatal outcomes

Objectives. The level of obesity among women of childbearing age continues to increase. The study aimed to assess the adverse obstetric and neonatal outcomes among obese pregnant women.

Materials and Methods. A retrospective case – control study was conducted in the Lithuanian University of Health and Sciences (LUHS) hospital, using data from their birth registry. Two groups of pregnant women, who gave birth in 2021 were analyzed and compared. The first group consisted of 334 obese pregnant women, the second group consisted of 324 pregnant women with normal BMI. IBM SPSS software was used for data processing. Results with values of $p < 0.05$ were considered statistically significant.

Results. Results provide that more cesarean section surgeries were performed on obese pregnant women (33.2%) compared to women with normal BMI (18.2%) ($p < 0.001$). In comparison to women with normal BMI, induction and augmentation of labor were more often performed on obese pregnant women (45.4%, 31.7% and 54.6%, 68.3% respectively). Research indicates that obese women have almost four times higher possibility for their infant to have fetal macrosomia (≥ 4000 g) ($p < 0.01$). Evidence suggests that newborns born to women with normal BMI tend to have higher APGAR scores after 5 minutes as against obese pregnant women ($p = 0.047$). The possibility of stillbirth was three times higher for obese in contrast to normal – weight pregnant women (0.9% vs 0.3%).

Conclusions. In our study cesarean section surgery, induction and augmentation of labor were frequently performed more on obese pregnant women than to normal weight pregnant women. The most common neonatal outcomes due to maternal obesity were: fetal macrosomia, higher newborn weight, lower newborn APGAR score after 5 minutes and higher probability of stillbirth.

VAGINAL VERSUS CESAREAN DELIVERY OF VERY LOW BIRTH WEIGHT (VLBW) INFANTS IN RIGA MATERNITY HOSPITAL 2015–2019

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Keywords. Very low birth weight; Vaginal delivery; Cesarean delivery

Objectives. Very low birth weight (VLBW), weight < 1500 grams, often is associated with preterm birth. In the case of preterm birth, a planned Cesarean section can be protective, but can also cause mother and neonate morbidity and mortality, therefore the best type of delivery for preterm infants is still controversial. The aim of this study was to compare the short-term neonatal outcomes of VLBW infants by type of delivery.

Materials and Methods. This retrospective study included VLBW neonates born from 480 to 1490 grams admitted to the Neonatal Intensive Care Unit in the Riga Maternity hospital 2015–2019. Data were collected from the hospital's medical records and included maternal demographics, perinatal data, and neonatal short-term outcomes up to the time of discharge from the hospital or death. Statistical analysis of data was performed using IBM SPSS 27.0. Statistical significance was considered at $p \leq 0.05$.

Results. In the study, 207 patients were analyzed, two were excluded because of unknown delivery mode. There were 82 (39.6%) vaginal and 125 (60.4%) Cesarean deliveries. Greater gestational age (GA) was associated with Cesarean delivery ($p < 0.001$). Apgar scores of less than six were associated with the GA of 24 to 26 weeks in both groups, but vaginally delivered neonates more often (32.9% vs. 10.0%). Infection and respiratory distress syndrome rates were greater with the vaginal delivery (36.6% vs. 10.4% and 73.2% vs. 58.1%, respectively). Pneumothorax and hemorrhage did not differ between groups. Survival rates did not differ, but in both groups were statistically significantly associated with the lowest GA of the group.

Conclusions. Survival rates do not differ by delivery mode. Vaginal delivery is associated with lower GA and birth weight of the neonate, therefore short-term outcomes are worse. The mode of delivery of VLBW infants should be evidence-based and patient-centered rather than based on a possible better outcome for the newborn or mother.

PHARMACOLOGICAL METHOD VERSUS COMBINED METHOD FOR LABOUR INDUCTION

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Keywords. Induction; Labour; Methods

Objectives. Induction of labour is a common obstetric procedure. Nowadays, pharmacological and mechanical induction methods are mostly used in the same case only when one or the other failed, however there has been done little research about the use of these methods simultaneously. This study aimed to compare the effect of these methods of labour induction on the duration of induction and labour, as well on labour and perinatal outcome.

Materials and Methods. Study is based on 4264 pregnant women data. After selection patients were divided into two groups. In the Misoprostol group induction was performed by a 25 mcg dose of Misoprostol orally every 2 hours. In the Combined method group labour was induced with Misoprostol according to the same arrangement combined with Foley catheter (60 mL). Statistics was performed by SPSS statistics.

Results. There were found statistically significant differences in relation to the time from the start of induction to the onset of labour, in nulliparous women it was 16 h 23 min in the Misoprostol group and 12 h 22 min in the Combined method group, in multiparous women – 12 h 30 min vs 9 h 30 min ($p < 0.001$). Analogous results are detected about the time from induction to delivery. In nulliparous women group this was 25 h 20 min in the Misoprostol group and 20 h 23 min in the Combined method group, in the multiparous women 17 h 22 min vs 14 h 17 min ($p < 0.001$). Nulliparous women in the Combined method group had shorter duration of labour. There was no difference between the groups in the rates of chorioamnionitis, cesarean section, assisted delivery, newborn Apgar score ≤ 6 after 1st minute, and newborn admission to the Intensive care unit.

Conclusions. The combined method of induction of labour with oral Misoprostol and a Foley balloon-catheter shortens the duration of induction and the induction-to-delivery time for all women and the duration of labour for nulliparous women.

FAMILY DOCTORS' SELF-REPORTED COMPETENCE IN THE MANAGEMENT OF SEXUAL HEALTH ISSUES

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Keywords. Family doctors; Sexual health

Objectives. Sexual health is fundamental to the overall health of individuals and families, and the sustainable development of society. However, questions related to sexual health are rarely brought up in appointments with family doctors (FDs). We aimed to assess FDs' self-reported competence in sexual medicine and to evaluate the need for education on sexual medicine in Latvia.

Materials and Methods. A quantitative cross-sectional study of FDs in Latvia was conducted in March–June 2022. The pre-piloted questionnaire consisted of fields: socio-demographic; self-reported competence in discussing and managing patients with sexual health issues; the source of education on sexual medicine and the need for further education. Self-completed questionnaires were distributed electronically to FDs who had an e-mail address registered at the two professional associations of FDs, paper surveys were conducted during the meetings. Data were analyzed using SPSS.

Results. 111 FDs participated in the study, the mean age was 55.1(± 12.5) years and 70.3%(n = 78) of responders working more than 10 years, 35.1%(n = 39) worked in Riga, 64.9%(n = 72) in other cities. Overall, the FDs reported medium competence in discussing and managing sexual health questions. The competence in discussing ($V = 0.685$, $p < 0.001$) and managing ($V = 0.575$, $p < 0.001$) sexual health questions with male or female patients was similar. FDs reported that if they do not feel competent in managing the problem, they usually refer patients to a gynecologist (84.7%, n = 94) or urologist (88.3%, n = 98). The most important source of education on sexual medicine was medical journals (71.2%, n = 79), followed by conferences (61.3%, n = 68). Most of the FDs participating in the study (89.2%, n = 99) would like to increase their knowledge on sexual medicine. The most preferred form of education was lectures (84.7%, n = 94), followed by online platforms (46.8%, n = 52).

Conclusions. Overall, the FDs reported a medium competence in the management of sexual health issues with patients. FDs expressed the need for further education in sexual medicine.

THE CORRELATION BETWEEN CERVICAL EXCISION DEPTH AND TRANSFORMATION ZONE TYPE

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Keywords. Transformation zone type; Cervical excision; CIN

Objectives. Cervical electroexcision is the method for treating cervical intraepithelial neoplasia (CIN). The depth of excision is the main factor for a successful therapeutic outcome. One of the determining factors for depth of excision is the transformation zone type of the cervix. This study aimed to determine if there is a correlation between cervical excision depth and transformation zone type in women who had cervical electroexcision at the Riga East Clinical University Hospital and whether the depth of cervical excision corresponds to existing recommendations.

Materials and Methods. 104 women who underwent cervical excision therapy at Riga East Clinical University Hospital were enrolled in this cross-sectional study. Data were collected from May to December 2022. Patient records, colposcopy, and histology protocols were obtained, and data analysis was performed with SPSS statistical software. The study was approved by Riga Stradins University Research Ethics Committee.

Results. A total of 95 excisions done by 6 doctors were analyzed. 9 of excisions were done with 2 or more fragments without specifying the order of excision, therefore the exact depth was unknown. 55.8% (n = 53) of excisions were made accordingly to recommended excision depth, 35.8% (n = 34) of excisions were insufficient in depth, but 8.4% (n = 8) excisions exceeded the recommended excision depth. No significant correlation between cervical excision depth and transformation zone type was found. But a significant connection was found between the colposcopic findings and histology report. In cases of unsatisfactory colposcopy, there was a tendency to receive a CIN1 or benign cell changes in histology report (p < 0.001).

Conclusions. Although transformation zone type is one of the factors contributing to cervical excision depth, a significant correlation between the cervical excision depth and the transformation zone type was not found. Cervical excision depth corresponded to existing recommendations in half of cases.

THE IMPACT OF PERIMENOPAUSAL AND MENOPAUSAL SYMPTOMS ON WOMEN'S QUALITY OF LIFE IN LATVIA

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Keywords. Perimenopausal/menopausal symptoms; Quality of life

Objectives. According to the data of the Central Statistical Bureau of Latvia (CSB), in 2021, 54% of the total population in Latvia were women; moreover, women aged 45 and over constituted 53% of the total female population in Latvia. The aim of this research was to determine the most frequent perimenopausal/menopausal symptoms among women in Latvia and to evaluate their impact on women's quality of life.

Materials and Methods. A cross-sectional study was conducted from June to November 2022 based on a self-administered online questionnaire. The severity of menopausal symptoms was assessed using the Menopause Rating Scale (MRS). The study was approved by the Ethics Committee of Rīga Stradiņš University. The data was processed using IBM SPSS Statistics 28.0.

Results. A total of 806 women aged 45 to 55 participated in the study (mean age 50.6; SD \pm 3.2). 47.1% (n = 380) of the women were in menopause (mean age of menopause 49.60; SD \pm 2.7), 52.9% (n = 426) reported that they have not reached menopause yet. Overall, the most frequently reported symptoms were physical and mental exhaustion (85.52% vs. 84.97%), sleep problems (88.68% vs. 74.88%), and hot flushes (92.63% vs. 67.60%); however, sexual problems and urogenital symptoms were reported least frequently. Statistically significant difference was observed between the two groups as regards the severity of the symptoms ($p < 0.001$) with a higher prevalence among postmenopausal women. The impact of the symptoms on everyday life was evaluated as 'slight, but endurable' (53.5% vs. 44.5%).

Conclusions. Moderate to severe symptoms were reported by perimenopausal, menopausal women in Latvia. The results highlight a discordance between the severity of perimenopausal/menopausal symptoms and the self-reported impact on women's everyday life. A further study might be beneficial to identify women's attitude towards menopause and knowledge on the available options as regards the treatment.

EFFECT OF APPLIED TREATMENT METHOD OF GESTATIONAL DIABETES MELLITUS ON OBSTETRIC COMPLICATIONS

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Keywords. Gestational diabetes mellitus; Treatment; Complication; Insulin

Objectives. To determine obstetric complications related to GDM treatment method.

Materials and Methods. A retrospective study was performed using the data from the Department of Obstetrics and Gynecology of the Lithuanian University of Health Sciences Birth Registry in 2020 and 2021 to compare two groups of women with GDM: Group I – P.White A1 (glycemia was corrected lifestyle changes), Group II – P. White A2 (glycemia was corrected with lifestyle changes with additional insulin therapy). Data analyzed using IBM Statistics SPSS for frequencies, T and χ^2 tests. Results with values of $p < 0.05$ considered statistically significant.

Results. Majority of women, 1908 (67%), were with GMD White A¹ More primigravida and nulliparous women were in group I ($p = 0.001$, $p = 0.001$), more multigravida and multipara in group II ($p = 0.001$, $p = 0.001$). Obesity was more common in group II ($p = 0.001$). Weight gain during pregnancy was higher in group II ($p = 0.049$). GDM was commonly diagnosed with the fasting glucose test at the first antenatal visit in group II ($p = 0.001$) and with OGTT in group I ($p = 0.001$). In regards of glycemic control, fasting glycemia, OGTT after 1 and 2 hours were higher in group II ($p = 0.017$, $p = 0.012$, $p = 0.006$). Newborn macrosomia was more often diagnosed in group I ($p = 0.046$). Large for gestational age newborns were found in group II ($p = 0.007$). Induction of labor commonly used in group II ($p = 0.001$). According to method, amniotomy and misoprostol were more popular ($p = 0.001$, $p = 0.001$).

Conclusions. Concomitant use of insulin therapy is more frequent in multigravidas and obese women. There were significant links between treatment method for GDM and these obstetric complications: macrosomia and larger for gestational age newborns, induction of labor.

USE OF ADDITIONAL MANIPULATIONS (ADD-ON) IN THE PROCESS OF MEDICAL FERTILIZATION IN A SMALL POPULATION OF LATVIAN WOMEN

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Keywords. Add-on; ART

Objectives. Additional manipulations are offered in the process of medical fertilization to improve the probability of successful conception and delivery of a child. All of the procedures are extra charged, and some of them have not been proven effective in other studies. This study aims to determine add-ons that are offered to the small women population in Latvia.

Materials and Methods. Cross-sectional prospective study (2022–) where statistical data analysis was performed using IBM SPSS v28.0. Twenty-one questionnaire interview questions were analyzed for a total of 27 patients, in which patients were asked in detail about the process of the ART (assisted reproductive technology), costs, and awareness of the procedure.

Results. A total of 27 patients participated in the study with a mean age of 36.0 ± 6.5 SD and a partner age of 38.0 ± 6.1 SD. The main reasons for infertility for having ART were a female factor (33.3%) and unexplained infertility (29.6%), in 22.2% infertility of both partners. 48.1% of the ART procedures were self-funded. Regarding patient self-investment, 40.7% admitted that they paid more than 4001 euros; 18.5% both paid in the range of 1001–2000 euros and less than 500 euros for ART. The majority of participants 55.6% ($n = 15$) were offered an add-on. 63% ($n = 17$) of all patients chose to have an add-on. The add-on offered the most was Embryogluue 33.3% ($n = 9$), the second most offered was Embryoscope 22.2% ($n = 6$).

Conclusions. All the patients who were offered chose to have an add-on procedure. More than one third of the participants had additional high costs for the ART. The most offered and chosen procedure was Embryogluue. All patients who chose an add-on confirmed that the procedure was explained to them and that the reason for choosing the procedure was the doctor's recommendation to improve live birth rate.

SURGICAL TREATMENT AFTER USING METHOTREXATE IN THERAPY OF ECTOPIC PREGNANCY

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Keywords. Ectopic pregnancy; Methotrexate; Surgical treatment

Objectives. Ectopic pregnancies occur in 19.7 cases out of 1000 pregnancies in North America, and is the leading cause to maternal mortality in the first trimester. One of the treatment modalities for ectopic pregnancy is methotrexate. The purpose of this study is to analyse the frequency of methotrexate use and identify the outcomes, most importantly surgical treatment after methotrexate therapy.

Materials and Methods. A retrospective cross-sectional study of 404 patients who were diagnosed with ectopic tubal pregnancy in three Latvia based hospitals (Pauls Stradiņš Clinical University Hospital, Riga East University Hospital, Vidzeme Hospital) in the time period between 1 January 2020 and 1 May 2022. The primary treatment method is initially evaluated: conservative or surgical. Patients treated with methotrexate are then selected. The outcome of treatment is evaluated.

Results. A total of 404 patients with tubal ectopic pregnancies were treated at all 3 treatment facilities between January 2020 and May 2022. Of these patients, 30.45% (123 patients) were treated primarily conservatively, while 69.55% (281 patients) were treated surgically. Of patients treated conservatively, 30.08% (37 patients) were treated with an expectant management tactic, or prescribed with recommendations, and 69.92% (86 patients) were treated with MTX. After the first dose of MTX, there were 3 outcomes: discharge in 67.45% (58 patients), administration of second dose in 4.65% (4 patients) and surgery in 27.90% (24 patients).

Conclusions. It can be concluded that the use of MTX requires a common regimen that can be guided by prescribing the drug, such as the Fernandez scale, as it makes it easier to classify patients by the treatment they need and reduce the number of cases where treatment has been chosen inaccurately and has resulted in complications.

THE SPECTRUM OF GENETIC AND CONGENITAL ABNORMALITIES IN FETICIDES IN LATVIA

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Keywords. Feticide; Perinatal death; Fetal pathology; Central nervous system anomalies; Cardiovascular anomalies

Objectives. The development of ultrasonographic diagnostic methods has been crucial in early diagnosis of fetal abnormalities and early pregnancy termination if necessary. However, certain diseases cannot be seen during early pregnancy and are diagnosed only in the second trimester. With parental agreement feticide – a procedure in which the death of the fetus is attained in utero – can be performed to terminate the pregnancy. The aim of this study was to detect the most common causes of feticide in Latvia.

Materials and Methods. Autopsy protocols (1st January 2017 – 31st December 2022; Children's Clinical University hospital of Latvia) were retrospectively reviewed to reveal the most common congenital and genetic abnormalities, identified in feticides. Descriptive statistics were applied (GraphPad, Boston, USA).

Results. During the evaluated period, there have been 717 cases of perinatal deaths, including 69 feticides (9.6%; 95% confidence interval(CI):7.7–12.0). Central nervous system anomalies were found in 19 feticides (27.5%; CI:18.3–39.1); congenital cardiovascular defects in 14 cases (20.3%; CI:12.4–31.4); multiple congenital anomalies in 9 autopsies (13.0%; CI:6.8–23.2); urogenital anomalies and musculoskeletal congenital malformations in 3 cases (4.4%; CI:1.0–12.5) each; craniofacial anomalies and intrauterine growth retardation in 2 feticides (2.9%; CI:0.2–10.6) each; genetic/chromosomal abnormalities (including trisomy 21, DiGeorge syndrome, Klinefelter syndrome, Beckwith-Wiedemann syndrome among others) in 11 cases (15.9%; 9.0–26.5). Feticide was less commonly associated with diaphragmatic hernias, congenital anomalies of respiratory system, generalised fetal edema, cytomegalovirus infection, congenital malformations of the digestive tract and fetal alcohol syndrome – 1 case (1.5%; CI:0–8.5) in each category.

Conclusions. In Latvia, feticides represent a significant fraction of perinatal deaths, emphasizing the importance of diagnostic ultrasonography. Central nervous system anomalies, congenital cardiovascular defects and genetic/chromosomal abnormalities were the most frequent findings in these cases. Only few feticides were attributable to infections and toxic substances.

PLACENTAL VOLUME OF THE 1ST TRIMESTER AND PREGNANCY OUTCOMES

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Keywords. Placental volume; 1st trimester; Pregnancy outcomes; Fetal growth restriction; Preeclampsia; Birthweight

Objectives. Identify correlations between placental volume in the 1st trimester and pregnancy outcomes. Compare the interobserver agreement of the assessed placental volumes.

Materials and Methods. This prospective cohort study was undertaken at the Prenatal Unit of the Riga Maternity Hospital between January 2021 and May 2022. Unselected women with singleton pregnancies presenting for the first trimester screening between 11 and 13 weeks were included. All scans were carried out by a specialist and saved for offline evaluation. All ultrasound examinations were performed by abdominal ultrasonography. The Virtual Organ Computer-aided Analysis technique was used to analyze all stored volumes off-line by one ultrasound specialist and a 6th year medicine student. Placental volume between 10th and 90th percentiles was considered as normal. Information regarding the delivery details was collected from the maternity hospital databases. Statistic analysis involved descriptive statistics and inferential statistics. The significance level to reject the null hypothesis was fixed as $p \leq 0.05$.

Results. This study included 123 pregnant women. Pregnancies associated with placental volume above the 90th percentile showed a statistically significant proportion with large for gestational age fetuses, $p = 0.009$. Women with placental volume in the first trimester above the 90th percentile showed a borderline significant proportion with macrosomia cases, $p = 0.049$. Women, which placental volume in the first trimester was below the 10th percentile had the newborn with statistically significant lower birthweight, $p = 0.003$. Inter-observer agreement shows a good agreement –the interclass correlation is 0.894.

Conclusions. This study found a correlation between placental volumes above 90th percentile both with macrosomia and large for gestational age fetuses. Placental volumes below 10th percentile resulted in lower birthweight. However measurements for placental volume in the first trimester were not sufficient to establish a great association with fetal growth restriction or preeclampsia. Great interrater reliability was found between values recorded by specialist and medical student, but more studies are needed to replicate this with more students.

ABORTION TENDENCIES AND THEIR SURVEILLANCE SYSTEM'S CHALLENGES IN LATVIA

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Keywords. Abortion; Surveillance in Latvia; Statistics

Objectives. Sexual and reproductive health (SRH) is crucial for further sustainable development. It is impossible without reliable data and research to inform and monitor the impact of policies and practices. Good abortion surveillance system is a part of SRH monitoring.

Materials and Methods. Abortion is one of the SRH areas included in the “Study on factors and habits affecting the sexual and reproductive health of the population in Latvia” (Id. No. VM 2019/18/ESF) of the Ministry of Health of the Republic of Latvia implemented by the Institute of Public Health of the Rīga Stradiņš University) (Project N. 01-33.2.2/134). The goal of this study is to analyse the tendencies of abortions in Latvia from 2011 to 2021 year and determine the challenges of their surveillance.

Results. From 2011 to 2021 the total number of abortions has decreased 52% which can be related to improvement in sex education and access to contraception. The most common age of women who have terminated pregnancy has increased from 25–29 years old (2011–2018) to 30–34 years old (2019–2021). Abortions were mostly performed in Riga region. In recent years the most common were induced abortions (in 2021 55% from the total abortion number). The number of spontaneous abortions is not changing over this time period. There were difficulties to access the data of the total number of abortions per 1000 women and late abortions since 2018, as well as complete lack of data about hospitals where abortion is available, gestational week when abortion was performed, methods of abortion and complications.

Conclusions. The number of induced abortions in Latvia is decreasing. Some data are available; however, more comprehensive data would allow detailed analysis and evidence-based actions.

BREASTFEEDING INFLUENCE ON HEALTH OUTCOMES IN THE SELECTION OF LATVIAN WOMEN

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Keywords. Breastfeeding; Exclusive breastfeeding; Postpartum period

Objectives. Breast milk is considered the most suitable source of nutrients for infants. Breastfeeding has both early and late benefits for the mother's health. WHO recommends starting breastfeeding within the first hour after birth and continuing exclusive breastfeeding during the first 6 months. The aim was to determine the number of women who breastfeed, evaluate the early benefits of breastfeeding on mothers' postpartum period, and assess patients' knowledge of breastfeeding.

Materials and Methods. Data were obtained through a self-made questionnaire aimed at Latvian women, who gave birth from 2017 to 2022. The questionnaire consisted of 4 sections – basic information, information about pregnancy/childbirth, breastfeeding, and the woman's awareness of breastfeeding. As a result, 854 responses were collected. Qualitative data were described as counts and percentages. Data were analysed using quantitative methods – Pearson's chi-squared test; Fisher's exact test. Organized in MS Excel, and analysed using IBM SPSS Statistics 28.0 program.

Results. First, women were divided into 2 groups – breastfeeding $n = 817$ (95.7%) and non-breastfeeding $n = 37$ (4.3%). Breastfeeding mothers were divided into 4 subgroups. Overall, the most common postpartum complications were swollen, painful, and erythematous breasts (15.9%); lower abdominal pain (14.8%); changes in sutures/ postoperative scar (11.7%), however 28.5% of women did not have any complications. There is a statistically significant association between breastfeeding and no complications during the postpartum period ($p = 0.047$). Breastfeeding mothers 356 (43.6%) were more likely to report no postpartum complications compared with non-breastfeeding mothers 10 (27%). There is no statistically significant association between breastfeeding and the duration of postpartum complications ($p = 0.181$), although, there is a statistically significant association between breastfeeding and weight loss ($p < 0.001$).

Conclusions. Breastfeeding has physical and psycho-emotional benefits for the woman's health, therefore we need to promote it, educate mothers, and help those mothers with difficulties.

A CASE OF SMALL INTESTINE ATRESIA IN FETUS

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Keywords. Small bowel atresia; Gastrointestinal defects; Double bubble sign

Introduction. Small intestinal atresia is a gastrointestinal defect characterized by the abnormal closure, discontinuity, or narrowing of the duodenum, jejunum, or ileum. The most common type is duodenal atresia which is detected prenatally by the presence of the “double-bubble” sign and polyhydramnios beyond 24 weeks of gestation. If small bowel atresia is suspected, it is necessary to refer the pregnant women to a Perinatal center for further investigation.

Case Description. A 26 year old woman came to a perinatologist consultation when the dilation of intestines of a fetus was noticed during 28th week ultrasound. The ultrasound was performed again 3 times within 3 weeks and dilated intestinal loops up to 23 mm with active peristalsis, placental lakes and polyhydramnios were found. A multidisciplinary council, consisting of obstetricians-gynaecologists and paediatric surgeons, decided to hospitalize the patient at 37 weeks of gestation, however, the patient was admitted at 36⁺² gestational weeks due to weakened fetal movements. The patient successfully delivered a female baby vaginally. After the birth, an X-ray was performed, which confirmed intestinal obstruction. During the laparotomy, type IV small bowel atresia was confirmed and a small bowel resection was performed. Antibiotics were prescribed to the newborn, due to a bacterial infection at 12 days. At the age of 28 days, the mother and the newborn were discharged.

Summary. The case presents a pregnant woman that comes to Perinatal center after ultrasound showed abnormalities of the fetal small intestines. Surgery on the newborn was performed postpartum, which confirmed small bowel atresia diagnosis

Conclusions. This case illustrates the importance of repeatedly performed ultrasound examinations during the pregnancy. The ability to diagnose intestinal atresia prenatally makes it possible to refer the patient to a Perinatal center in time where appropriate care will be provided.

KNOWLEDGE OF HUMAN PAPILLOMA VIRUS AMONG ADOLESCENTS AND THEIR PARENTS

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Keywords. Human papilloma virus; Adolescents; Parents; Knowledge

Objectives. Human papilloma virus (HPV) is a sexually transmitted pathogen which can be found in approximately 80% of sexually active females and males. Although HPV goes away in 9 out of 10 cases, it remains as a main reason for anogenital and neck/head cancer development in women and men. The aim of the study was to compare knowledge about HPV between adolescents and their parents, and between genders in each group.

Materials and Methods. A total of 170 respondents (77 adolescents in the age 14–18 and 93 parents) were asked to fill questionnaire that included questions about HPV infection transition, symptoms, risk factors and prevention methods. Survey was presented in Latvian and Russian. Questionnaires were posted on social media such as Facebook and Instagram and sent to schools from April 2022 till August 2022. This research was approved by the Ethics Committee of RSU.

Results. Out of all respondents, 132 (77.65%) have heard about HPV before. It was observed that the parent's group had higher tendency (90.32%) to encounter information about HPV than the adolescents' group (62.34%) which was statistically significant ($p < 0.001$). The main source of information about HPV is social media and internet resources for both groups – parents (57.10%) and adolescents (77.10%). 22.90% of adolescents have marked parents as their main information source. Statistically significant differences in common knowledge about HPV infection, risk factors, symptoms, and prevention between groups and between genders in each group were not detected.

Conclusions. Parents have heard about HPV infection more often than adolescents. In the parents group women had more information about HPV than men. Respondents in both groups (adolescents and parents) and among both genders have basic knowledge about HPV. 28% of adolescents and parents have extensive knowledge about HPV.

MICROBIOLOGICAL FINDINGS, INFECTION RISK FACTORS AND COMPLICATIONS AMONG CHILDREN AFTER TRACHEOSTOMY

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Keywords. Tracheostomy; Children; Respiratory infections; Tracheostomy complications

Objectives. Bacterial infection of the respiratory tract is highly common among pediatric patients with tracheostomy. The aims of this study were to determine the prevalence of different airway microbes in tracheostomized patients and the incidence of bacterial infection as well as analyze infection risk factors and complications.

Materials and Methods. Retrospective data of officially reported cases was collected from 2018 to 2022 in Riga Children's Clinical University Hospital (RCCUH). Demographic factors, airway microbiological findings, tracheostomy related complications, underlying conditions, and outcomes for 37 patients were collected from database Andromeda. The data was analyzed using MS Excel. This study received an ethical approval from RSU Ethics Committee.

Results. Microbiological analyses were done in 78.3% (n = 29) of the cases. Most cultures were obtained from airway aspirate. Altogether 46 different species of microbes were identified. The most frequently identified bacteria were *Pseudomonas aeruginosa* (72.4%; n = 21) and *Staphylococcus aureus* (65.5%; n = 19). Forty-eight per cent (n = 18) of the patients had respiratory tract infections which required hospitalization. Overall, there were 60 hospitalization episodes of which 51.6% (n = 31) were caused by pulmonary bacterial infection, 25% (n = 15) by non-bacterial infection and 0.05% (n = 3) in result of local wound infection. The rest 18.3% (n = 11) of hospitalization episodes were due to granulation tissue. The risk factor that showed the greatest significance in the development of bacterial infection was ventilator dependency. Formation of granulation tissue in the airways was found to be the most common complication.

Conclusions. This study summarizes most common pathogens, risk factors and complications, which should be considered while treating pediatric patients after tracheostomy. The results of this study demonstrate that *P. aeruginosa* and *S. aureus* have the highest prevalence among pediatric patients with tracheostomy. This research will help to develop guidelines for pediatric patient with tracheostomy care in RCCUH.

ALBUMIN AND DIURETIC THERAPY INDICATIONS AND EFFECTIVENESS TREATING PAEDIATRIC PATIENTS WITH NEPHROTIC SYNDROME

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Keywords. Paediatric; Nephrotic syndrome; Albumin; Diuretics

Objectives. Nephrotic syndrome (NS) manifests as massive proteinuria (≥ 3 g/L or ≥ 3 g in daily urine), oedema, hypoproteinaemia, hypoalbuminaemia, and hyperlipidaemia. The main treatment of NS is corticosteroids. Diuretics are prescribed for patients with significant swelling. If the patient has significant hypoalbuminaemia (< 20 g/L), oliguria and severe oedema albumin infusion therapy is prescribed together with furosemide. The aim of this study was to evaluate albumin and diuretic therapy indications and effectiveness treating paediatric patients with nephrotic syndrome.

Materials and Methods. A retrospective analysis was performed based on the medical histories of the paediatric patients treated in Lithuanian University of Health Sciences Kaunas clinics Department of Children Disease in the period of 2017–2021. A total of 71 cases of nephrotic syndrome were identified. Pearson χ^2 criterion and Mann-Whitney test were used in statistical analysis.

Results. Albumin infusions were more often given to patients with elevated haematocrit level ($p = 0.033$). Multiple albumin infusions were given according to the following indications: 1) hypoalbuminaemia (< 20 g/L); 2) oliguria; 3) persistent oedema; 4) increased weight. A single dose of albumin was effective in 25.5% of patients, as there were no criteria for re-dosing. The subjects were divided into two groups by prescribed treatment: 1) steroids only, steroids and furosemide, steroids and albumin ($n = 32$) and 2) steroids together with albumin and furosemide combination ($n = 39$). In the first group, diuresis at hospital discharge was normal in 75% of patients and in the second group – 94.9% of patients ($p = 0.017$). Remission of nephrotic syndrome (based on negative urine dipstick readings or trace of protein ($< 1+$) on three consecutive days) was equally achieved in both the first and second groups.

Conclusions. Administration of combined albumin and furosemide is equally effective as treatment with separate medications if given by indications.

COMPARISON OF POST-OPERATIVE RESULTS IN PATIENTS WITH ESOPHAGEAL ATRESIA TREATED BY THORACOTOMIC VERSUS THORACOSCOPIC METHOD. SINGLE CENTER EXPERIENCE

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Keywords. Oesophageal atresia; Thoracoscopy; Thoracotomy; Single center experience

Objectives. The incidence of esophageal atresia in Latvia is 1 per 3000 children. Taking into account that the application of the thoracoscopic method to patients with esophageal atresia in Latvia started in 2019, it is important to compare the treatment results of this surgical method with the previously used treatment method – thoracotomy.

Materials and Methods. A retrospective study, including 33 patients with oesophageal atresia who underwent repair either thoracoscopical or thoracotomical treatment method in Children's Clinical University hospital. Intra- and post-operative outcomes of both techniques has been compared.

Results. Of 33 patients included (girls n = 11, boys n = 22), 21 (63.6%) underwent thoracotomy and 12 (36.4%) thoracoscopy. Median age (in days after birth) of performing procedure was 2 days. The median time with barium swallow examinations (using x-ray) was at the 9th day after surgery. Duration of surgery (p = 0.810), hospital stay (p = 0.171, median 27 days) and postoperative intubation (p = 0.079) did not differ by approach. Although time to 1st oral feeding did not show statistically significant difference (p = 0.573), data showed that oral feeding could be started 2 days sooner after thoracoscopic surgery. Similarly there was no significant difference in postoperative stricture rate (p = 0.824) or in fistula recurrence (p = 0.523) between thoracoscopy and thoracotomy. However statistically significant differences was seen in pleural drainage duration (p = 0.050) showing that the duration of drainage after a thoracoscopic procedure is shorter.

Conclusions. Thoracoscopic repair of oesophageal atresia has the advantage of faster evacuation of pleural drainage and could possibly reduce the length of first oral feeding time. Meanwhile both treatment methods showed similar intra- and post-operative outcomes therefore both are safe and effective.

THE IMPRESSION OF RECURRENT RESPIRATORY INFECTIONS IN PRIMARY CARE PRACTICES IN LATVIA FOR 2–7-YEAR-OLD CHILDREN IN THE PRE COVID-19 PANDEMIC PERIOD

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Keywords. Pediatric; Retrospective study; Recurrent respiratory disease; Primary care practice

Objectives. Recurrent respiratory tract infections (RRTI) are common occurrence among preschool children. However, there is very limited data available describing RRTI definition, frequency and management guidelines in pediatric population. Our aim was to gain insight into general understanding of RRTI and the burden from preschool pediatric population with RRTI on primary health care institutions.

Materials and Methods. A retrospective, descriptive and analytical study, included 105 primary care practices located in different regions of Latvia during the year of 2019. The primary care practices filled out the questionnaire about pediatric population 52837 from with 16943 were preschool aged children from 2–7 years of age. The understanding of RRTI definition, prevalence, principles of therapy, vaccination status and recovery time were analyzed from questionnaire. Also, financial, time and psycho-emotional burdens were analyzed using Spearman's rank correlation coefficient.

Results. The results revealed that 25.5% (n = 27) practitioners stated that more than half of the patient population in the studied age group suffered from RRTI and 55.6% (n = 15) needed from 1–2 weeks to recover. There was no common understanding of the definition of RRTI. Although the treatment tactics where symptomatic medications such as nasal decongestants in 92.5% (n = 98) and antipyretics in 90.6% (n = 96). Significant correlation (r = 0.784; p < 0.01) between time and psycho-emotional burden on primary care practices were confirmed, meanwhile relationship between financial and time burden correlation turned out to be insignificant.

Conclusions. The surveyed primary care practices did not have a common understanding of the definition and therapy of RRTI. Perhaps the development of common guidelines will reduce morbidity, which could reduce the burden of the disease.

PEDIATRIC POLYTRAUMA: A RETROSPECTIVE EPIDEMIOLOGICAL ANALYSIS FROM 2018 TO 2019

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Keywords. Pediatric polytrauma; Multiple injuries

Objectives. Worldwide, pediatric trauma is the main cause of concern, regarding the frequency of admissions to the Pediatric Emergency Department (PED), and is the leading cause of death in this age group, especially when it comes to polytrauma. The aim of this investigation was to analyze all pediatric multiple trauma cases between 2018 and 2019 in the PED of Lithuanian University of Health Sciences Hospital Kauno Klinikos (LSMU KK).

Materials and Methods. A retrospective analysis from the electronic record data system was conducted including all polytrauma cases of children aged 0–18 years from 2018 to 2019 referred to LSMU KK PED. The polytrauma categorization covered codes T00–T14 from the ICD-10-AM. In total, we investigated 349 patient records by analyzing and comparing cases between 2018 and 2019, seasonality, types, locations, and demographics (age and gender).

Results. In 2018, 165 pediatric polytrauma cases were recorded, and in 2019 – 184 (52.7%). Regarding the location of the injury, in both times unspecified injuries 136 (39.0%) had the biggest number of cases. The most common polytrauma type among both genders, was superficial injuries, in 2018 (125; 75.8%) and 2019 (138; 75.0%). The arm traumas were chiefly in groups of 1–6 year-olds, in all other age groups unspecified injuries were the most frequent. However, in all groups of age, the main polytrauma type was the same – superficial injuries. Summer was the most often season for PED visits due to multiple trauma 132 (37.8%) but the biggest peak was seen in May, 56 (16.0%).

Conclusions. The most common polytrauma type among all groups of age was superficial injuries. The unspecified injuries (39.0%) were recorded as the most frequent location. However, in the group ages of 1–6y, arm injuries were the most often. A significant increase in the number of pediatric polytrauma was observed in the summer.

CHILDHOOD CENTRAL NERVOUS SYSTEM TUMORS IN LATVIA: DEMOGRAPHY, MORPHOLOGY AND SURVIVAL RATES

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Keywords. Pediatric CNS tumors; Epidemiology

Objectives. Central nervous system (CNS) tumors are the most common childhood malignancies after leukemias, accounting for about a quarter of all childhood tumors. Malignant brain tumors continue to be significantly related to mortality and morbidity despite advancements in pediatric tumor treatment. This study aimed to summarize data about patients' demography, CNS tumor morphology, and survival rate.

Materials and Methods. This is a retrospective study. Patient records were accessed through the Children's Clinical University Hospital clinical system "Andromeda". Inclusion criteria: patients with primary CNS tumors, age 0-17 years, first diagnosed in years 2012-2021. Statistical analysis was conducted using SPSS.

Results. Information about 137 patients with 139 primary tumor cases was collected – 56 (40.9%) – female and 81 (59.1%) – male. Patients were divided into groups by age – 0-12 months (8.0%; N = 11), 1-4 years (24.1%; N = 33), 5-10 years (31.4%; N = 43), 11-17 years (36.5%; N = 50). The most common histological group among all ages except 0-12 months were gliomas making up 69.6% (N = 96) of all cases – with pilocytic astrocytoma (23.2%; N = 32) being the most common subtype. The most common group in the 0-12 month age were embryonal tumors making up 23.2% (N = 32) of all cases. The overall 5-year survival rate for pediatric brain tumors was 73.1% (N = 138). From the most common histological types – low-grade gliomas (which include pilocytic astrocytomas (N = 32), diffuse astrocytomas (N = 13) and other unspecified low-grade gliomas (N = 28)) had the best prognoses with 5-year survival rate of 100%. High-grade gliomas had the worst prognoses with 2-year and 5-year survival rates for glioblastoma (N = 8) being 36.5% and 18.2% respectively and for other unspecified high-grade gliomas (N = 14) both rates being at 18.4%.

Conclusions. The male gender was more frequently diagnosed with CNS tumors. The most common CNS tumor histological groups and overall survival rate corresponds with data from the literature.

CLINICAL MANIFESTATIONS OF CHILDHOOD CENTRAL NERVOUS SYSTEM TUMORS IN LATVIA

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Keywords. Pediatric CNS tumors; Clinical manifestations

Objectives. Pediatric central nervous system (CNS) tumors tend to have a wide variety of symptoms depending on the location and size of the tumor. It is crucial for pediatric healthcare professionals to be able to identify early symptoms that might indicate a CNS tumor. The aim of this study was to summarize data about the primary tumor locations, the duration of the patients' complaints and the type of symptoms.

Materials and Methods. A retrospective study was conducted using patient data from Children's Clinical University Hospital clinical system "Andromeda". Criteria for inclusion: patients with primary CNS tumors, age 0–17 years, first diagnosed in years 2012–2021. Data was analyzed with SPSS Statistics.

Results. The study analyzed 139 primary CNS tumor cases from which most were located in the infratentorial region (50.4%; N = 70) rather than the supratentorial region (40.3%; N = 56) and a few tumors were located in both (2.9%; N = 4). The rest were in the spinal cord (6.5%; N = 9). The mean duration from the beginning of the initial symptoms up to the first time a patient sought medical attention was about 4 months (Mdn = 4 weeks). Patients with high-grade CNS tumors sought help sooner with the mean duration from the onset of symptoms being 6 weeks (Mo = 1 day), while patients with low-grade CNS tumors on average sought help 6 months (Mo = 4 weeks) after the initial symptoms started. Most common pediatric CNS tumor clinical manifestations were symptoms of increased intracranial pressure (ICP) (71.0%; N = 98); gait disturbances (26.1%; N = 36); cranial nerve pathologies (24.6%; N = 34); systemic symptoms (15.2%; N = 21); seizures (15.2%; N = 15.2%) and papilledema (15.2%; N = 21).

Conclusions. The most common location for CNS tumors was the infratentorial region. Patients with high-grade CNS tumors sought help sooner than patients with low-grade CNS tumors. Most common pediatric CNS tumor clinical manifestations were ICP, gait disturbances and cranial nerve pathologies.

RISK FACTORS AND MANAGEMENT OF 2–7 YEAR OLD CHILDREN WITH RECURRENT RESPIRATORY TRACT INFECTIONS IN PRIMARY CARE PRACTICES IN YEAR 2019

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Keywords. Recurrent respiratory infection; retrospective study; primary care practice

Objectives. Children with recurrent respiratory tract infections represent a great challenge for the paediatrician, from both therapeutic and preventive standpoints. Even though majority of respiratory infections are mild, it's important to determine whether there are association with environmental exposure, previous management or host derived factor.

Materials and Methods. Retrospective, descriptive and analytical study analyzing risk factors, treatment, performed examinations and provided recommendations from 85 children from 10 primary care practices (PCP) in Latvia. Collected data was in time phrame starting from 01-January 2019 to 31-December 2019.

Results. The peak of respiratory tract infections in primary care practices are at the age of 2 and 3 years (63.5% (n = 54)). Respiratory tract infections are more common in boys than in girls. The most common diagnosis for children who were referred to PCP was “acute nasopharyngitis” and “acute upper respiratory infections of multiple and uecified sites”. No significant corelation ($p > 0.05$) between frequency and duration of disease related to vaccination status, father education, the total number of children in the family, place of residence and comorbidities detected. Meanwhile relationship between mother education and disease frequency was significant ($p = 0.008$) as well as place of residence between nasopharingitis ($p = 0.018$). The most commonly used therapy was nasal decongestants – 76.5% (n = 65) and antipiretics– 67% (n = 57).

Conclusions. Development and implementation of recommendations for management of children with recurrent respiratory tract infections would standardize the process of therapy and prevention, possibly reducing the frequency of recurrent respiratory infections in the given group of patients.

ASSOCIATION BETWEEN EXISTING RISK FACTORS AND HOSPITAL BED DAYS IN PATIENTS WITH ACUTE COVID-19 INFECTION IN PAEDIATRIC POPULATION

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Keywords. SARS-CoV-2; Paediatrics

Objectives. The goal of this study was to compare risk factors that could potentially affect the course of the acute COVID-19 infection among paediatric patients and to evaluate whether the presence of risk factors worsen the clinical course.

Materials and Methods. A data of 182 patients who were admitted to Children's Clinical University Hospital between 1st of September 2021 and 31st of January 2022 was retrospectively analysed. The Mann-Whitney test was used to analyse the number of hospital bed days in patients with and without risk factors. Fisher exact test was used to analyse how risk factors affect oxygen saturation. Data was analysed using IBM SPSS.

Results. Patients with at least one risk factor had higher median size of hospital bed days – 3 (IQR = 2–6) compared to patients without risk factors – 2 (IQR = 1–3, $p < 0.001$). Patients with congenital/genetic diseases had higher median size of hospital bed days – 4.5 (IQR = 3–7) compared to patients without congenital/genetic diseases – 2 (IQR = 1–3, $p < 0.001$). Patients with obesity had higher median size of hospital bed days – 6 (IQR = 4–7.5) compared to patients without obesity – 2 (IQR = 2–4, $p < 0.005$). Among the patients with obesity ($n = 2$, 40%) $SpO_2 \leq 92\%$ was more common compared to patients without obesity ($n = 12$, 6.8%, $p < 0.0048$). Patients who developed pneumoniae had higher median size of hospital bed days – 5 (IQR = 3–7) compared to patients without pneumoniae – 2 (IQR = 1–3, $p < 0.001$).

Conclusions. Our study showed statistically significant difference in hospital bed days between patients with at least one risk factor and patients without risk factors. Among the analysed, obesity, congenital/genetic diseases affected hospital bed days the most. $SpO_2 \leq 92\%$ was more common in patients with obesity compared to patients without obesity. Patients with pneumoniae had higher number of hospital bed days than patients without pneumoniae.

ASPECTS OF RECURRENT RESPIRATORY INFECTIONS IN PRIMARY CARE PRACTICES IN LATVIA FOR 2-7 YEAR OLD CHILDREN IN THE PRE COVID -19 PANDEMIC PERIOD

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Keywords. Recurrent respiratory disease; Paediatric; Primary care practice

Objectives. Although the majority of recurrent respiratory tract infections (RRTIs) are mild and self-limiting, the high prevalence of RRTIs creates a significant health and economic burden. Main objective of this study is to find out the understanding of RRTI's between family doctors, to review the burden, risk factors and management of recurrently ill children.

Materials and Methods. A retrospective study, including data from 105 primary care practice's (PCPs) as well as medical history of 85 children from different PCP and 1365 children from Children's Clinical University Hospital (CCUH) in 2019 were analyzed. The mean age, common diagnosis, and days of hospitalization has been analyzed from CCUH database and the understanding of RRTI definition, burden of RRTI's, as well as risk factors and management has been analyzed by review of completed questionnaires.

Results. Peak of respiratory tract infections are at the age of 2 and 3 years (51.94% (n = 709) turned to CCUH and 63.5% (n = 54) to PCP). Respiratory tract infections are more common in boys than in girls. The average frequency of illness are 7 days with a peak in winter. 67 (64%) of PCP's fully or partially agree with the definition of RRI proposed by the Italian colleagues. Analyzed data showed that the management of children with RRTI's is a significant psycho-emotional (n = 68 PCP) and time (n = 68 PCP) burden. No significant correlation ($p > 0.05$) detected between frequency and duration of disease related to vaccination status, father education, the total number of children in the family, place of residence and comorbidities. Meanwhile relationship between mother education and disease frequency was significant ($p = 0.008$) as well as place of residence between nasopharyngitis ($p = 0.018$). Treatment of RRTI's are mainly symptomatic.

Conclusions. Although the treatment of recurrent respiratory illness is similar, implementation of recommendations would potentially facilitate and systematize the management of RRTIs.

PEDIATRIC AUTOIMMUNE ENCEPHALITIS ASSOCIATION WITH INFECTION

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Keywords. Pediatric neurology; Autoimmune encephalitis; Infection

Objectives. Autoimmune encephalitis (AE) is caused by immune mediated antibodies against proteins on nerve cell surfaces. Diagnosis of AE is challenging due to overlapping clinical presentation and complexity of normal behaviour in developing child. However, the etiology of AE is unknown the autoimmune process can be subsequent to events like vaccination, infection, trauma. The aim of this study was to identify prevalence and characteristics of infection as trigger of AE.

Materials and Methods. We performed a retrospective study with diagnosed AE, admitted to the Children's Clinical University Hospital from 01.2017 to 12.2021. Data was collected from CCUH information system database and analysed by IBM SPSS version 27.0.

Results. Study included 16 patients with diagnosed AE with the mean age 8.0 ± 5.6 years 44% ($n = 7$) were females and 56% ($n = 9$) were males. Majority of patients 63% ($n = 10$) had seronegative AE and 37% ($n = 6$) seropositive. Previous infection was present in 75% ($n = 12$) cases and the most prevalent infection was acute respiratory tract infection 58% ($n = 7$). Peak of AE onset was at spring 48% ($n = 6$) and autumn 33% ($n = 5$). More than half 63% ($n = 10$) AE patients had long-term sequel after AE, in group with previous infection it was 67% ($n = 8$) and in group without previous infection it was 50% ($n = 2$). Time frame between AE symptom onset and infection were between 2 and 30 days. Patients with previous infection are referring to hospital mean of 3.9 ± 3.31 days, patients without infection mean of 11.6 ± 9.7 days (missing data for one patient).

Conclusions. Majority of AE patients previously had infection within last month of AE presentation. Patients with previous infection seek for help sooner despite that group with previous infection have higher rate of long-term sequel. It is important to consider AE diagnosis, when patient presents with complex neuropsychiatric symptoms and anamnesis of infectious disease in recent past.

ATYPICAL PRESENTATION OF PAEDIATRIC DIABETES MELLITUS: A CASE REPORT

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Keywords. Paediatric diabetes; Diabetes Type 1; Children

Introduction. Diabetes Mellitus Type 1 (DM1), is a metabolic disorder that leads to absolute insulin deficiency. It usually presents in children. Diagnosis is symptomatic and biochemical confirmation.

Case Description. A 3-year-old, male, presented at his house doctor (28/9/22) with a rash, abnormally clingy and lethargic behaviour, 8 days after returning from a 6w European holiday. The parents attributed the rash to nappies, used while travelling and applied different ointments. Clinically the rash presented like *Staphylococcus aureus* dermatitis and was treated with Augmentin & topical Bactroban. The lethargy and clingy behaviour were attributed to re-adjustment after travelling. On 11/10 the mother consulted the doctor with the patient complaining of the rash, lethargy, decreased social interaction and play, increased water drinking and bedwetting. On examination, the patient was lethargic, unhappy, not interacting as usual and had a sour-apple smell. To confirm the diabetes diagnosis, a urine dipstick showed 4+ glucose and 4+ ketones and the glucometer – high. Diabetic ketoacidosis (DKA) was diagnosed. The child was admitted to the paediatric ICU. On admission S-glucose was > 60 mmol/L and HbA1C 16.3. DKA was confirmed by the paediatrician. The patient was treated with Insulin Aspart (Novorapid) 36 IU and Insulin degludec (Treciba) 3 IU nocte. On 24/10 patient's glucose averaged 13 mmol/L, the rash decreased and he returned to his playful self.

Summary. A 3-year-old boy presenting with a nappy rash, infection and lethargy after an 8-week European holiday was diagnosed with Diabetes Mellitus Type 1.

Conclusions. The atypical presentation of a rash and infection as the primary symptoms of DM1 in paediatric patients is a rare occurrence.

NEUROLOGICAL PERSPECTIVE OF PIGV-CDG MUTATIONS: A CASE SERIES OF SIX POLISH PATIENTS

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Keywords. Paediatric neurology; PIGV; CDG; Developmental delay; Epilepsy

Introduction. Glycosylation is the main element of the post-translational transformation of most human proteins, necessary for various biological processes. Since this process is crucial for the cell's functioning, its defects lead to a diverse spectrum of phenotypes and severity of symptoms, generally described as congenital disorders of glycosylation (CDG). This case series discusses the neurological aspects of CDG on the basis of the medical history of six patients in whom the PIGV-CDG mutation was detected and diagnosed.

Case Description. The medical record of six patients aged 6 to 22 years was collected and analyzed. In all cases the same PIGV homozygotic mutation (c.1022C > A (p.Ala341Glu)) was found, although the patients present a diverse spectrum of neurological disorders. The symptoms include altered muscular tonus, delayed motor development, intellectual disability, and autism spectrum disorders – especially concerning problems with controlling and expressing emotions. During an interview the data regarding the development of speech, hearing, and vision was collected, which led to the discovery of delays in every case. Imaging examinations (CT and MRI) were also performed, focusing on organic abnormalities in the central nervous system. EEG examination detected functional alterations of electrical activity in patients' brains, which in some of them corresponded with the clinical characteristics of the presented severe epileptic seizures.

Summary. The phenotype found in patients consists of developmental delay, hypotonia, brain malformations (olfactory bulb hypoplasia, enlarged intercerebral spaces, delayed myelination), and epilepsy.

Conclusions. Despite the low prevalence of PIGV-CDG mutations, they pose a significant threat to children's health due to their severe clinical phenotype, consisting of global developmental delays and neurological deficits. Therefore it is crucial to raise awareness regarding the possible symptomatology of this disorder, especially among physicians not experienced in metabolic medicine. In this way, it is possible to ensure appropriate diagnostics and care for these children.

EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) IN A NEONATE WITH MECONIUM ASPIRATION SYNDROME – FIRST PATIENT IN LATVIA

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Keywords. Meconium aspiration syndrome; ECMO; Neonate

Introduction. ECMO has been used in neonatology for more than 40 years. One of the most common indications for ECMO in this age group is meconium aspiration syndrome. It is defined as respiratory distress in newborns born through meconium-stained amniotic fluid whose symptoms cannot be explained otherwise.

Case Description. We report the case of a neonate born from the second pregnancy, the second acute Cesarean delivery due to meconium-stained fluid, and acute fetal distress. In the first minute of life, there was bradycardia and no spontaneous breathing, and uncompensated metabolic and respiratory acidosis in blood gases. The neonate was intubated, hypothermic therapy was started and the baby was transported to Children's Clinical University Hospital in Riga. Even on high-frequency oscillatory ventilation and inotropes, pulmonary hypertension, and hemodynamic instability progressed and the Concilium made the decision of contacting the Karolinska University ECMO team. In the 40th hour of life, the ECMO procedure was started and the newborn was transported to the ECMO center of Karolinska University Hospital. After 5 days, the newborn was transported back to Children's Clinical University Hospital in Riga, still being on invasive ventilation. Two days later, the neonate was extubated and received noninvasive ventilation for 19 days. The patient was discharged home on the 36th day of life.

Summary. This report demonstrates a case of a neonate born with meconium aspiration syndrome, being the first newborn born in Latvia to receive successful ECMO therapy.

Conclusions. ECMO can be used successfully in the neonatal period. International cooperation can and should be done in rare cases like this when specific therapy cannot be performed on-site.

GABRA1 GENE VARIANT DETECTED FOR A PATIENT WITH TREATMENT-RESISTANT EPILEPSY: A CASE REPORT

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Keywords. Epilepsy; GABRA1; GABA

Introduction. GABRA1 (OMIM #137160) is a gene, located at chromosome 5q34, that encodes the alfa-1 receptor subunit of GABA. Variants that impair the function of this gene lead to treatment-resistant epilepsy and various degree of developmental delay, and autistic features. Idiopathic generalized epilepsy accounts for 30% of all epilepsies. We present an observed GABRA1 gene variant and its impact on the patient's health.

Case Description. Our patient is a 9-year-old girl. She is diagnosed with developmental delay from infancy, predominantly speech impairment. At age 1 she presented with short seizures, manifesting differently. At first, it would recur 10–15 times a day. Sodium valproate was prescribed. It had a short-term effect but led to seizures recurring 90 times daily. In an attempt to control the seizures – polytherapy was indicated. Sleep EEG was performed – multifocal and generalized epileptiform activity were observed. Brain MRI showed likely terminal zones of myelination. The patient was diagnosed with idiopathic generalized epilepsy and showed resistance to therapy. When referred to a clinical geneticist consultation – whole exome sequencing (WES) with epilepsy & brain development disorders panel was performed and a missense heterozygous GABRA1 gene (NM_001127643.2) variant c.918G > T, p.Lys306Asn was detected and classified as likely-pathogenic. Parents' genetic testing results are unremarkable, therefore the variant is de novo. The patient's phenotype (OMIM #615744) and genetic testing results were compatible with a rare genetic epilepsy diagnosis.

Summary. A female patient, diagnosed with idiopathic generalized epilepsy and developmental delay was consulted suspecting a genetic etiology. WES was performed and a de novo likely-pathogenic heterozygous GABRA1 gene variant was detected, confirming a developmental and epileptic encephalopathy 19.

Conclusions. Genetic testing for patients, diagnosed with treatment-resistant epilepsy and developmental delay is crucial. It is necessary while determine the prognosis and treatment plan. In this case, the patient's condition is revised yearly.

DIGEORGE (22Q11.2 DELETION) AND BERNARD-SOULIER SYNDROMES COMBINATION. A CASE REPORT

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Keywords. Bernard-Soulier syndrome; DiGeorge syndrome; Thrombocytopenia

Introduction. DiGeorge syndrome: AD disease caused by 22q11.2-deletion. It mostly occurs as a result of de-novo mutation. Incidence: 1–2 cases per 10000 live births. The classic triad: conotruncal cardiac anomalies, hypoplastic thymus, hypocalcemia. Bernard-Soulier syndrome: AR disease with incidence 1:1000000. It is characterized by thrombocytopenia and giant platelets. Clinically, the patient bruises easily, and have a nose, GI bleeding, purpura, and petechiae.

Case Description. Boy, born from graviditas I, in sept. 41⁺⁰, birth weight 4,360g. Apgar 8/9. No pathologies were observed at birth. On the 2nd day appeared a small amount of bleeding from the nose, petechiae on the back, and in the groin. Severe thrombocytopenia and mild hypocalcemia were diagnosed. On the 3rd day of life, the child was transferred to the NICU, where a plasma transfusion was performed. The condition worsens, the patient had tonic-clonic seizures, SpO₂ 87% (with O₂ support), CT showed sinus venous thrombosis, and subarachnoid hemorrhage. Therapy with anticoagulants was started. The additional diagnoses are shortened hypoglossal ligament, cryptorchidism, and astigmatism. At the age of one year was performed: an excision of the tongue tie, revision of the left inguinal canal, and left orchofuniculectomy. Thrombocytopenia remains all the time. In the immunogram < CD8+ T-cells. Increased naive T- and T-helpers. Genetic tests detected DiGeorge and Bernard-Soulier syndromes. The patient had recurrent hemorrhages, rashes, laryngitis, and episodes of stridor. Videofibrobronchoscopy revealed slight tracheal dyskinesia. The patient regularly receives transfusions of platelets and erythrocytes. Autistic spectrum disorders are suspected (at 2 years old).

Summary. The main problem is thrombocytopenia. This contributed to complications – subarachnoid hemorrhage, and periodic bleeding, leading to anemia. The patient constantly receives iron supplements. Platelet mass transfusions were received only in critical situations. As well he has the tendency to get ARVI episodes more often.

Conclusions. Both syndromes are rare, their combination is described only several times. The more this combination will be described, the faster will be diagnostic and the clearer correlation of symptoms.

A 15-YEAR-OLD PATIENT WITH SUSPECTED ANTIPHOSPHOLIPID SYNDROME: A CASE REPORT

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Keywords. Antiphospholipid syndrome; Hypercoagulability; Children

Introduction. Antiphospholipid syndrome (APS) is an autoimmune multisystem disorder characterized by arterial, venous, or small vessel thromboembolic events and/or pregnancy morbidity in the presence of persistent antiphospholipid antibodies (aPL). The main laboratory criteria for the diagnosis are the presence of antiphospholipid antibodies on ≥ 2 occasions ≥ 12 weeks apart. To meet laboratory criteria, at least one persistently positive aPL must be present in moderate to high titers

Case Description. A 15-year-old male patient presented for a suspected antiphospholipid syndrome at the hospital of the Lithuanian University of Health Sciences. He is a basketball player, and has a diagnosis of Osgood-Schlatter disease, due to which he wears a compressing knee bandage. In June of 2022, the patient complained of pain in the left ankle, that resolved spontaneously. In September 2022 he suffered sudden pain, swelling, and prominent veins in his left calf. Then the patient was diagnosed with thrombosis of the left v. saphena magna, had high titers of anticardiolipin IgG, and was treated with Aspirin. The condition has improved. Laboratory tests for antiphospholipid syndrome were repeated after 3 months and all antiphospholipid antibodies (anti-cardiolipin (IgM and IgG), anti-beta2 glycoprotein (IgM and IgG), lupus anticoagulant) and coagulation parameters were within the normal range. No specific treatment was prescribed

Summary. Tests have shown that superficial venous thrombosis for this patient was not caused by the antiphospholipid syndrome. Mechanical pressure (compressing knee bandage) may have been the possible cause, but it is important to repeat the tests again if the thrombosis recurs for the patient.

Conclusions. Superficial venous thromboses can be caused not only by an antiphospholipid syndrome but should always be investigated if antiphospholipid antibodies are present. For patients with recurrent thromboses, it is very important to timely diagnose as well as to prevent future thromboses and long-term anticoagulation is sometimes necessary.

CASE REPORT OF SUBCUTANEOUS GRANULOMA ANNULARE PRECEDING IDIOPATHIC JUVENILE ARTHRITIS

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Keywords. Subcutaneous granuloma annulare; Rash; Pediatrics; Juvenile idiopathic arthritis

Introduction. Subcutaneous granuloma annulare (SGA) is a rare clinical form of granuloma annulare (GA) that predominantly affects children. While the cause of GA is yet unknown, recent studies show that there might be a link between GA and autoimmune disorders. Cases of GA triggered by SARS-CoV-2 have also been reported. Because of the various morphology of lesions, a biopsy is the most accurate diagnostic tool.

Case Description. We present a 2-year-old girl with a suddenly occurred left knee swelling, accompanied by a circular, not painful rash on both ankles with small subcutaneous nodules. Blood tests did not show inflammation. ANA test was positive. Ultrasound of the joints has shown effusion in the left knee, and heterogenous subcutaneous lesions, in the rash projection, with increased Doppler signal. NSAIDs were prescribed for knee arthritis with positive effects. After 6 months nodules enlarged significantly after the girl had a COVID-19 infection. The skin biopsy confirmed the diagnosis of SGA. Due to the tendency of spontaneous resolution the specific treatment was not necessary, and the granulomas disappeared in a few months. Unfortunately, at 4 years old the patient came back with typical signs of juvenile idiopathic arthritis (JIA) in the left knee. Intraarticular glucocorticoid injection was done and treatment with methotrexate was started.

Summary. We describe a case of a 2-year-old girl with SGA preceding JIA. SGA nodules enlarged significantly after COVID-19 infection. JIA was diagnosed 2 years after the first SGA nodules emerged.

Conclusions. SGA can be misdiagnosed because of the lack of overlying cutaneous changes. Thus, histopathological examination is important to confirm the diagnosis and rule out other disorders. Usually, GA does not require treatment and disappears within two years. However, GA can precede other autoimmune diseases.

WHAT HIDES UNDER RHABDOMYOSARCOMA MISDIAGNOSE? A MYOSITIS OSSIFICANS – CASE REPORT

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Keywords. Heterotopic ossification; Myositis ossificans; Rhabdomyosarcoma

Introduction. Myositis Ossificans (MO) is a malfunction in bone formation, resulting in heterotopic ossification within muscles or connective tissue. Various factors can exacerbate the disease. Given the rarity of the condition, it is often excluded from the differential diagnosis and might be at first mistaken for sarcomas due to symptoms' similarity to malignancies. Clinical and radiological presentations are useful to make a diagnosis, whereas any invasive procedures are contraindicated.

Case Description. A 15-year-old boy, admitted to the Department of Pediatric Oncology, Hematology and Transplantology in Poznań, with a history of pain in the right thigh area, previously subjected to imaging studies (ultrasonography and MRI) with initial suspicion of rhabdomyosarcoma in the right vastus medialis muscle. Physical examination revealed a clearly demarcated hard lesion in the right quadriceps muscle. Proper warming and color of the right thigh were preserved, and no swelling was seen at the examination. No other lesions were found by palpation. The biopsy was performed to confirm the hypothesis, however, the malignancy assumption was unequivocally rejected and the MO diagnosis was established. Searching for possible trigger factors, the further interview revealed Sars-CoV-2 infection six months prior to the diagnosis. A small hit in the area of the lesion was also reported. Following MR imaging revealed radiological correspondence with the histopathological results. Blood samples for the genetic test were collected and after a consultation with a rheumatologist, steroid therapy and NSAIDs were considered.

Summary. The biopsy, obligatory in diagnosing malignancies, revealed a rare condition – myositis ossificans.

Conclusions. Due to clinical course, the early MO symptoms raise concern for multiple conditions, with malignancies being the most severe. Although invasive procedures lead to exacerbation of the disease and are contraindicated on routine MO diagnosis, for some cases it might be beneficial for proper diagnosis establishment.

SMALLPOX OR A PARASITE? RARE SKIN MANIFESTATION OF SCABIES IN SIX-YEAR-OLD REFUGEE, REMINISCENT OF WHAT HAS ALREADY BEEN FORGOTTEN

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Keywords. Bullous scabies; Pyoderma

Introduction. Scabies is a contagious skin disease, caused by the mite, *Sarcoptes scabiei*. It occurs commonly worldwide, however, people living in poverty, in poor sanitary conditions and immigrants are most vulnerable to contracting the disease. Bullous scabies (BS) is a highly unusual subtype of scabies that affects mainly elderly individuals. To our knowledge, no more than 90 cases of BS have been reported up to date. Only a few of them concerned children under the age of 10.

Case Description. A six-year-old boy, a refugee from Kurdistan, was admitted to the emergency department with extensive skin lesions covering the entire body, accompanied by severe pain and irritability. The child temporarily lived at a refugee shelter. The interview was difficult to obtain due to the language barrier. Cutaneous examination showed multiple skin changes at different evolution stages, including pustules, serous-filled and pus-filled blisters, crusts, and ulcers. Edema of the hands and penis, skin dryness, and dehydration were also observed. The clinical manifestation was suggestive of chickenpox, which was excluded by an infectious disease specialist, who said that the rash is more reminiscent of smallpox. A skin lesion culture was performed and confirmed methicillin-resistant *Staphylococcus aureus* and *Staphylococcus pyogenes* presence. Information received from the refugee shelter revealed that the boy have suffered from scabies 2 weeks before. In the Pediatric Department, the patient was treated with Permethrin 5% Cream, Cefuroxime, and analgesic treatment. The child was discharged without any complications.

Summary. A pediatric patient suffering from pyoderma was admitted to the hospital suspecting chickenpox. Viral etiology of the disease was excluded and bullous scabies with bacterial co-infection was revealed.

Conclusions. Bullous scabies is infrequently observed, in the pediatric population in particular. However, knowledge about rare clinical signs of scabies is essential for practitioners to establish the proper diagnosis and provide appropriate treatment as quickly as possible to prevent complications.

MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C) WITH INVOLVEMENT OF CARDIOVASCULAR, RESPIRATORY AND GASTROINTESTINAL SYSTEM: A CASE REPORT

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Keywords. MIS-C; COVID-19

Introduction. MIS-C is a rare complication after COVID-19 that develops because of a dysregulated immune response with an excessive inflammatory response. The definition of MIS-C is based on the following criteria: age of 0–19 years, presence of fever for more than 3 days, involvement of more than two organ systems, elevated inflammatory markers, evidence of COVID-19 infection, and exclusion of differential diagnoses.

Case Description. In June 2022 a 7-year-old girl was hospitalized with complaints of fever, headache, jaundice, fatigue, and nausea for two days. Physical examination revealed icterus, abdominal pain, hepatomegaly, and palmar erythema. The patient was hypotensive at 86/53 mmHg and tachycardic at 127 bpm. Laboratory results showed leucopenia $3.29 \times 10^3/\mu\text{L}$, thrombocytopenia $58 \times 10^3/\mu\text{L}$, prolonged prothrombin time 48.2%, high ferritin 3278 ng/mL, bilirubin 117.34 $\mu\text{mol/L}$, ALT 2003.11 U/L, AST 2224.82, LDH 1165 U/L, D-dimers 4.63 mg/L FEU, creatinine 31.85 $\mu\text{mol/L}$, CRP 50.57 mg/L and NT-ProBNP 504.4 pg/mL. USG showed polyserositis, ascites, pericholecystitis, hepatolienal syndrome, fluid accumulation in pleural space, pericardial effusion, tricuspid, and mitral valve insufficiency. It was found that the patient has SARS-CoV-2 spike (s) protein antibodies and IgG against adenovirus. Differential diagnosis of adenovirus-associated acute hepatitis was excluded. Thereafter patient was diagnosed with MIS-C with involvement of the cardiovascular, respiratory, and gastrointestinal systems. Treatment with immunoglobulins, furosemide, spironolactone, low-dose methylprednisolone, and aspirin was started. After 12 days of hospitalization, the patient was discharged with recommended follow-up.

Summary. MIS-C is a rare complication after COVID-19 that manifests with multi-system involvement. This case report presents a 7-year-old girl with MIS-C with involvement in the cardiovascular, respiratory, and gastrointestinal systems.

Conclusions. The diagnosis of MIS-C is challenging due to the wide variety of clinical and laboratory manifestations. The initiation of immunoglobulin therapy is crucial for the recovery of the patient and should not be delayed as soon as there's a diagnostic suspicion.

BILATERAL FIBULA GROWTH PLATE TRANSFER TO RECONSTRUCT RADIAL LONGITUDINAL DEFICIENCY TYPE 4

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Keywords. Radial dysplasia; Reconstruction; Fibula growth plate; Neoradius

Introduction. Radial longitudinal deficiency (RLD) type 4 is a rare condition when patients have missing radial bone, significant forearm shortness, and limited movement.

Case Description. A 3-year-old patient presents with RLD type 4. A bilateral fibula growth plate dissected into right and left fibular proximal growth plates was used for RLD reconstruction. For vascularization, anterior tibial arteries were used. Osteosynthesis was performed to join both growth plates together with their distal parts. The created neoradius (length on X-ray 6.8 cm) was inserted into the forearm parallel to the ulna. Part of the biceps tendon was attached to carpal bones from the distal part of the fibula growth plate for wrist joint stabilization. Hand wounds were closed using a skin graft from the groin area. The patient was discharged from the hospital on the third postoperative day. Follow-up evaluation was observed at eight months and one year postoperatively. The total length of neoradius was 7.55 cm at the eight-month and 7.87 cm at the one-year follow-up. The ulnar length at operation time was 9.1 cm and at the eight-month 9.18 cm. Active motion of the wrist joint is possible with 45° flexion and limited pronation and supination (10–15°). Active and passive motions are limited in the fingers with the most severe deformity observed in the second finger. Both donor sites were examined and no functional problems were found. Full muscle strength (MRC five) recovered in both legs within three months post-operation.

Summary. A 3-year-old patient undergoes RLD type 4 reconstruction with bilateral fibula growth plate transfer. Body function/structure was evaluated by measures of range of motion, grip strength, sensibility, and radiographic parameters. Upper-extremity disability and symptoms were evaluated with the DASH scale.

Conclusions. Several methods have been developed for the effective treatment of RLD. The best treatment option still remains elusive as new techniques continue to evolve while standard techniques continue. Although we believe the bilateral fibular growth plate transplantation is a promising method to reconstruct unilateral RLD grade IV.

CAN A NEUROSURGEON HELP TO STOP FLUSHING AND PALING IN RELATION TO ONE'S CHILDHOOD EXPERIENCES? THE STORY OF HIPPOCAMPAL SCLEROSIS

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Keywords. Epilepsy; Children; Hippocampal sclerosis; Epilepsy surgery; MRI; PET/CT

Introduction. We here represent a boy whose temporal lobe seizures were not recognized for several years.

Case Description. Our patient had recurrent atypical febrile seizures and concussion before the age of 3 years. There were no convulsive seizures until school age. Episodes of chewing and facial discoloration were noticed. At the age of 6–8 years, these episodes changed – chewing was followed by dystonic movements of the left arm and automatisms of the right arm, as well as complex automatisms. At this period, temporal lobe epilepsy was diagnosed. The boy also revealed having auras. The signs of hippocampal sclerosis on the right side were found when the MRI was repeatedly reviewed. PET/CT also gave evidence of hippocampal sclerosis and possible cortical dysplasia on the anterior pole of the right temporal lobe. The anterior resection of the right temporal lobe was carried out. The auras continued. Status epilepticus was provoked by the flu. MRI revealed the remaining abnormal cortex on the anterior pole of the right temporal lobe. The surgery was repeated to remove the remaining pathological structures.

Summary. Our patient has two of the known risk factors for hippocampal sclerosis – febrile seizures and concussion. His temporal lobe seizures were not recognized while they consisted only of subjective feelings, vegetative signs, and oral automatisms. Furthermore, it is important for radiologists to be informed about the semiology and EEG findings, to analyze the MRI and PET as precisely as possible. Also, this case illustrates the significance of complete resection of the epileptogenic zone – any remaining structures are doomed to provoke a relapse of seizures.

Conclusions. Hippocampal sclerosis is a common reason for drug-resistant epilepsy. Lobectomy is a safe and effective treatment option. The awareness of the signs of temporal lobe seizures should be raised especially when approaching a patient with known risk factors for hippocampal sclerosis.

EBSTEIN-BARR VIRUS-ASSOCIATED HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS IN 12-YEAR-OLD GIRL

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Keywords. Epstein-Barr virus; Hemophagocytic lymphohistiocytosis; Macrophage activation

Introduction. Secondary hemophagocytic lymphohistiocytosis (HLH) is a rare and potentially lethal disorder due to dysregulated immune system and has a non-specific clinical presentation leading to diagnostic difficulties.

Case Description. A previously healthy 12-year-old girl presented to a hospital with a fever for 8 days, signs of acute upper respiratory infection, and pain in the back and abdomen. She has received antibacterial therapy without any improvement. The clinical investigation at the time of admission revealed cervical lymphadenopathy, hyperemia in the pharynx, high fever, and hepatosplenomegaly. The laboratory tests revealed leukocytosis, lymphocytosis, monocytosis, thrombocytopenia, and hyperbilirubinemia, accompanied by CRO 53 mg/L. Other relevant initial data included ALAT 198 U/L and D-dimers 19.44 mg/L. Suspicion of infectious mononucleosis was raised and further analysis revealed positive IgM EBV antibodies. The next week she received antibacterial therapy with cefuroxime and i/v methylprednisolone. The general condition continued to deteriorate – she developed a new macular rash on her face, cervical region, trunk, and upper extremities, periorbital edema, and polyserositis due to hypoalbuminemia. The febrile temperature continued. Due to positive EBV DNS count in serum– treatment with isoprenaline, methylprednisolone pulse therapy, and Anakinra were started. After continuous therapy, for a few days, the patient's general condition slightly improved, but she still had a febrile temperature, and the rash, hepatosplenomegaly, and thrombocytopenia remained. Trepanbiopsy revealed macrophage activation and hemophagocytosis, hyperactivity of CD8+ T lymphocytes. Other diagnostic criteria leading to HLH were met as well: fever, splenomegaly, cytopenia, increased ferritin, hypertriglyceridemia, and hyponatremia. Therapy with Rituximab was started which led to significant improvement. The patient was discharged 10 days after the initial dose.

Summary. The case demonstrates diagnostic difficulties of HLH in the setting of an EBV infection and wide therapeutic use that didn't get the expected effect.

Conclusions. A 12-year-old girl presented with non-specific symptoms, diagnosis lead to HLH which can be fatal in the absence of early specific treatment.

MALE ADOLESCENT ANOREXIA NERVOSA: A RESISTANT CASE WITH COMORBID DEPRESSION AND OBSESSIVE-COMPULSIVE DISORDER

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Keywords. Anorexia nervosa in male adolescents; Obsessive-compulsive disorder; Moderate depressive episode

Introduction. As anorexia nervosa in adolescent males is observed less commonly, it may prove a challenge to correctly diagnose and provide treatment. This case scenario displays a resistant case of male adolescent anorexia nervosa with comorbid depression and obsessive-compulsive disorder.

Case Description. A 15-year-old male was admitted to Child and Adolescent Psychiatry Department and diagnosed with anorexia nervosa, moderate protein-energy malnutrition, moderate depressive episode, and obsessive-compulsive disorder. The patient is a middle child and rates his relationship with siblings and parents favorably; his mother suffers from depression. The teenager began restricting food and expressing ideas of self-depreciation a year before, engaging in intense physical activity and predetermining meal portions. During the next 6 months, he went from 58–60 kg to 42 kg, and experienced fatigue, and apathy. His parents had noted his recent excessive cleanliness, orderliness, and the need to complete certain rituals. Psychological tests revealed depressive symptoms and social reclusion. The teenager, weighing 39.4 kg, was admitted to psychiatric care for 7 weeks, prescribed food supplements, fluoxetine, and aripiprazole, and took part in individual and group psychological consultations. He was discharged weighing 43.3 kg (3.9 kg increase). While he expressed a desire to gain weight, the motivation behind it was the frustration of being controlled. Within 3 weeks the patient lost 1.8 kg and was rehospitalized with a BMI of 13.87. During the 2nd hospitalization he went from 41.5 kg to 45.5 kg in 4 weeks; the patient expressed improvements regarding his depressive and obsessive symptoms.

Summary. This report presents a case of adolescent anorexia nervosa with aggravating comorbidities that relapses with outpatient treatment but is effectively treated with inpatient treatment.

Conclusions. Male adolescent anorexia nervosa, while uncommonly reported, has lately proven increasingly prominent; this case reaffirms that results are seen when a steady relationship is established between healthcare professionals and the patient's family.

SUBGLOTTIC STENOSIS AS AN EARLY PRESENTATION OF DIGEORGE SYNDROME

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Keywords. DiGeorge Syndrome; 22q11.2 microdeletion syndrome; Subglottic stenosis; Laryngotracheoplasty; Pediatric otolaryngology

Introduction. DiGeorge syndrome, a genetic disorder caused by the deletion of chromosome 22, is often associated with numerous clinical features, including cardiac malformations, velopharyngeal insufficiency, immune deficiency, parathyroid hypoplasia, and hypocalcemia. Laryngeal abnormalities, such as subglottic stenosis, subglottic webs, laryngotracheomalacia, and laryngeal cleft are also frequently reported.

Case Description. We report a case of an infant admitted to the Otolaryngology Department due to dyspnea and respiratory stridor. Before admission to our Department, the patient underwent the surgical management of intestinal malrotation associated with duodenal obstruction (malrotation with Ladd's band), complicated by difficulties in the patient's intubation and extubation. Our attention was also drawn to the patient's dysmorphic face: small ears, ptosis, hypertelorism, short nose with low nasal bridge, and epicanthic folds.

Summary. Based on the overall patient's presentation and symptoms: dysmorphic face, severe infections, and subglottic stenosis as an effect of the tracheobronchial branching abnormalities, we extend the diagnostics towards deletion of chromosome 22. The laboratory tests of the child showed a decreased level of total and ionized calcium as well as the level of vitamin D3. Genetic testing confirmed the diagnosis of DiGeorge syndrome.

Conclusions. DiGeorge Syndrome may exhibit multiple abnormalities and nonspecific clinical manifestations. Up to 60% of patients develop hypocalcemia. While gastrointestinal manifestations of DiGeorge Syndrome are rare, laryngeal abnormalities are relatively common. As respiratory tract disorders are more frequent in patients with DiGeorge Syndrome it is worth being aware of them – especially if other surgeries are planned.

HERPES SIMPLEX HEPATITIS AND ECZEMA HERPETICUM IN AN IMMUNOCOMPETENT CHILD

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Keywords. Eczema herpeticum; HSV; Hepatitis

Introduction. Clinical presentation of herpes simplex virus (HSV) hepatitis ranges from asymptomatic disease to acute liver failure. The majority of symptomatic infections occur in immunocompromised individuals.

Case Description. A 1.5-year-old boy with atopic dermatitis was admitted to the hospital due to skin erosions on both hands and a generalized vesicular rash. He was diagnosed with eczema herpeticum. Laboratory workup revealed significantly elevated liver aminotransferases and increased total bilirubin serum concentrations. Abdominal ultrasound showed hepatomegaly with liver hypoechogenicity and perivascular hyperechogenic lesions. Infections with HAV, HBV, HCV, EBV, and CMV were excluded. HSV-1 DNA was detected in the blood and the diagnosis of hepatitis caused by HSV-1 was made. He received treatment with intravenous acyclovir and hepatoprotective drugs. His clinical condition and laboratory results improved. HSV-1 DNA was undetectable after one week of treatment. Intravenous acyclovir was switched to the oral formulation and the child was discharged home. His liver enzymes normalized after a total of forty-nine days of treatment. He recovered without any complications. The immunity disorders including HIV infection were excluded.

Summary. An immunocompetent child was diagnosed with eczema herpeticum and HSV hepatitis treated successfully with aciclovir.

Conclusions. Hepatitis is an uncommon manifestation of HSV infection, however, it may occur even in immunocompetent individuals. Nevertheless, it can lead to life-threatening complications. Therefore, the treatment has to be introduced immediately.

CASE REPORT: HIRSCHSPRUNG'S DISEASE IN NEWBORNS. TOTAL COLONIC AND TERMINAL ILEUM AGANGLIOSIS. SECOND CASE IN FAMILY

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Keywords. Hirschsprung's disease; Newborns; Aganglionosis

Introduction. Hirschsprung's disease is an inherited disorder, which is characterized by an aganglionic colon segment that leads to intestinal obstruction. This is a rare disease with an incidence of 1 in 5000 live births, typically affecting newborns. Symptoms include gradual onset of vomiting with bile, abdominal distention, and failure to pass meconium in the first 48 hours of life. There is no bowel movement in the aganglionic region.

Case Description. Patient born from second pregnancy second vaginal delivery in 37⁺³ weeks with weight 3970 g, length 54 cm, Apgar scores 7/8. The Newborn tolerated breastfeeding well for the first two days but failed to pass meconium. 30 hours after birth patient started to vomit with bile and showed signs of abdominal bloating. Neonate was transported to Children's Hospital, where laparotomy was performed and a double-ileostomy was created. A biopsy also was taken. Genetic testing showed that the patient has a mutation in RET gene, which is a common genetic cause of this disease. In the family history from the first pregnancy, a boy was born with a diagnosis of total aganglionosis and total parenteral feeding for the first six years of life. Before the second pregnancy calculated risk of recurrence of Hirschsprung's disease was 14%.

Summary. Nevertheless, the risk of this disease's recurrence was not high, the second child got the same diagnosis as her older brother. This patient's diagnosis was confirmed quickly because of the family history, so the treatment was quick too.

Conclusions. Patients with Hirschsprung's disease are not common, so it is important to remember that there are rare inherited diseases that need to get diagnosed the sooner the better before complications have developed. The prognosis of Hirschsprung's disease is good if it is treated early.

PCDH19-RELATED EPILEPSY WITH DEVELOPMENT DELAY: A CASE REPORT

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Keywords. Epilepsy; PCDH19

Introduction. PCDH19 (OMIM #300460) is a gene, located at chromosome Xq22.1, that encodes a calcium-dependent cell-adhesion protein. Variants that impair the function of this gene have been identified in X-linked early-onset epilepsy, mild to severe developmental delay, and mental disability in females due to skewed X-inactivation. The phenotype of cognitive disabilities mostly consists of the autistic spectrum, general anxiety disorders, and psychosis. The goal of this case report is to present an observed PCDH19 gene variant and overview its impact on the patient's health.

Case Description. We report a 5-year-old girl who was diagnosed with early-onset epilepsy at 7 months of age. Seizures presented in clusters during infection with a high fever. Motor and speech development delays were also noticed. EEG showed focal epileptiform activity. Recurring seizures led to anti-epileptic polytherapy which stopped the seizures for 2 years and had a positive effect on cognitive development. Changes in medication and doses led to aggression and the recurrence of seizures. At age 4 she was consulted by a clinical geneticist. Phenotypically she had a long face, almond-shaped eyes, and dysplastic auricles. Whole exome sequencing (WES) with epilepsy & brain development disorders panel was performed and a nonsense heterozygous PCDH19 gene (NM_001184880.2) variant c.2656C > T, p.Arg886Ter was detected and classified as pathogenic. The patient's phenotype and genetic testing results were compatible with female-restricted epilepsy with intellectual disability (OMIM #300088).

Summary. WES was performed for a female patient, diagnosed with early-onset epilepsy and development delay. A pathogenic PCDH19 gene variant was detected. Diagnosis of female-restricted epilepsy with intellectual disability was made.

Conclusions. Genetic testing for patients, diagnosed with early-onset epilepsy and developmental delay, is beneficial. It helped to determine the prognosis – seizures may decrease or completely remit in adolescence, but symptoms of developmental delay will persist. Consistent neurological and psychiatric check-ups are recommended.

ONCOLOGY AND HEMATOLOGY

YEAR-OLD WOMEN WITH POLYPOID ADENOMYOMA OF CERVICAL CANAL WITH ATYPICAL GLANDULAR HYPERPLASIA, WITH HIGH GRADE ENDOMETRIOID ADENOCARCINOMA

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Objectives. Polypoid adenomyoma of the cervical canal with atypical glandular hyperplasia, with malignancy of the high-grade endometrioid adenocarcinoma type – such a histological finding of cervical cancer is rare and there are no other case reports of such a histological finding of cervical cancer.

Clinical case is about a 28-year-old woman, nulliparaous. At 23th of November patient came to the Riga East Clinical University Hospital for medical help, had complains about abnormal vaginal bleeding (recurrent hypermenorrea, abnormal bleeding other than menstrual), since October 2022. On the day of hospitalization hemoglobin was 41 g/L. The patient was hospitalized in the Gynecological clinic. Were made many biopsies from cervix tumor. Only 4th biopsy from cervix showed – superficial, tiny GII squamous cell carcinoma complexes without flaking. On 20th of December was organized a joint council with gynecologist and oncogynecologists. Due to the fact that conservative therapy and vascular embolization have not been effective, it was decided to transfer patients for further treatment to the Latvian Oncology Center department of Oncogynecology. On the 22th of December was made palliative operation – upper and lower middle laparotomy. Total hysterectomy with a wide vaginal cuff. Bilateral salpingectomy. Biopsy of the left side of the parailiac lymph nodes. Bilateral ovarian transposition. Drainage. After stabilization of the patient's condition, the patient was discharged from the hospital at 7th day after operation. After that followed an Oncogynecological (MDT) multidisciplinary tumour board meeting. Final diagnosis – Cervical cancer IIB (pT2b cN0M0G3L+V-Pn-R0). Complications of diagnosis – parametrial infiltration. Council's conclusions – radiotherapy and chemotherapy are indicated. Conclusion: A multidisciplinary team should be involved in the treatment of a young women.

AGE-DEPENDENT EXPRESSION OF MATRIX METALLOPROTEASES IN BREAST CANCER TISSUE AS PROGNOSTIC MARKER OF CANCER COURSE

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Objectives. A characteristic feature of breast cancer (BC) between young women is a high risk and rapid development of local recurrences, as well as low patient survival rates. In young patients with breast cancer, there is also a high frequency of neoplasms of the triple-negative (basal) molecular subtype, which is characterized by an aggressive course and low sensitivity to treatment. Considering this, the search for factors that would allow predicting the aggressive potential and the optimization of complex treatment of young BC patients remains one of the most current tasks of modern oncology. There are reports about critical role of tumor microenvironment remodeling as factor of tumor growth in young women. Matrix metalloproteases (MMPs) are considered as major microenvironment remodeling enzymes. Our aim was to estimate differences in MMPs expression in tissue of BC patients of different age.

Materials and Methods. The protein expression was evaluated using the immunohistochemical method. The study was conducted on 120 tumor samples from BC patients (40 below 45 years, 80 older 45 years).

Results. The analysis of the MMP expression in the tissue of patients with BC depending on age established significantly higher levels of MMP-2 and MMP-9 (1.4 and 2.5 times ($p < 0.05$)) in the patients < 45 years old. No significant difference in MMP-1 indicators was found in patients with breast cancer depending on age. It was established that the expression level of MMP-2 and MMP-9 was 1.6 ($p < 0.05$) and 2.2 ($p < 0.05$) times higher in patients with basal subtype breast cancer younger than 45 years, accordingly, compared with similar indicators of patients with tumors of the luminal molecular subtype.

Conclusions. According to the results of the conducted immunohistochemical study, high levels of MMP expression in BC tissue of young patients are associated with an aggressive course of tumor process of the basal molecular subtype

ALLELIC METHYLATION STATUS OF THE PSA PROMOTER MAY BE A NEW POTENTIAL MOLECULAR MARKER FOR SEVERITY OF PROSTATE CANCER

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Objectives. The aim of the study is to determine the allelic methylation status of the PSA proximal promoter in a prostate cancer (PCa) cell line model using PC3 and LNCaP, prostate cancer cell lines, and BPH-1 as a non-cancer control.

Materials and Methods. All cell lines were cultured at 37°C in a 5% CO₂ atmosphere incubator according to company-provided protocol. The bisulfite treated DNA was used to amplify the promoter region of the PSA with primers specific for bisulfite converted DNA. 16–20 clones for each PCR product were sequenced and analysed. DNA sequencing was performed using the ABI BigDyeTerminator Cycle Sequencing Kit v3 and the sequences were detected on an ABI 3130XL Genetic Analyzer.

Results. The methylation of 6 CpGs dinucleotides and 5 CCWGGs pentanucleotide motifs (W = A/T) harboured in PSA proximal promoter was detected in a prostate cancer cell line model. The allelic methylation status of the PSA promoter has shown that prostate cancer cell lines have characteristic allele-specific methylation ranging from: biallelically methylation-free – LNCaP (indolent PCa), having biallelic PSA expression; monoallelic CpG methylation accompanied by methylation of two proximal CCWGG sites of the same allele – BPH1 (non-cancer control); biallelic CpG promoter methylation, – PC3, PSA is not expressed. Lack of PSA expression, as in PC3 cells (aggressive PCa), due to biallelic methylation of the PSA promoter, in clinic will be lead to false negative results in PSA-based PCa testing due to gene silencing in a growing population of cancer cells.

Conclusions. Determining the allelic methylation status of the PSA promoter will explain the discrepancy between PSA levels and PCa disease in PSA-based PCa testing and can significantly improve PSA-based PCa analysis by translating promoter methylation status into specific PCa disease severity, according to the PCa cell line model study.

ASSOCIATION OF PROGNOSTIC LEUKEMIC CELL SURFACE MARKERS WITH THE MUTATION STATUS OF THE IMMUNOGLOBULIN HEAVY CHAIN VARIABLE REGION GENES IN UNTREATED PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA

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Objectives. Chronic lymphocytic leukemia (CLL), the most common type of adult leukemia, shows highly variable disease courses. Patients with the low-risk disease do not require chemoimmunotherapies, while patients with the high-risk CLL need the therapy urgently. The mutation status of the immunoglobulin heavy chain variable region genes (IGHV) is currently determining the choice for therapy in CLL. CD38 expression on circulating CLL cells had been associated with the unmutated IGHV. Earlier, we demonstrated in CLL patients the correlation between expression on PB CD19⁺CD5⁺ lymphocytes of CD38 and the chemokine receptors CCR1 and CCR2. Since mutation analyses are still unavailable to many CLL patients due to the complexity and expenses, we analyzed an association of the IGHV mutation status with the co-expression of the cell-surface markers CD38, CCR1, and CCR2, which can be used in the routine clinical flow cytometry (FC) diagnostic.

Materials and Methods. We determined the IGHV mutation rates in 100 untreated CLL patients using the European Research Initiative on CLL (ERIC) recommendations and protocol. The frequencies of the CD38⁺, CCR1⁺, and CCR2-expressing PB CD19⁺CD5⁺ lymphocytes were measured using multi-parameter flow cytometry. The study was funded by the projects: Lzp No.lzp-2018/1-0156 and RSU Nr.6-ZD-22/14/2022.

Results. The frequency of the CCR1⁺ and CCR2-expressing PB CD19⁺CD5⁺ lymphocytes in untreated CLL patients positively correlated with the frequency of the known negative prognostic marker CD38. Higher frequencies of the CD38-expressing (> 30%) and CCR2-expressing (> 10%) PB CD19⁺CD5⁺ lymphocytes were observed in patients with unmutated IGHV: 33% and 70%, respectively, versus 20% and 52% in patients with mutated IGHV.

Conclusions. Migration of the CCR2-expressing CLL cells into secondary lymphoid organs apparently contribute to disease progression. Along with CD38, detection of CCR1 and CCR2 on circulating leukemic cells can be suggested for the clinical FC diagnostic to assure accurate prognoses of the high-risk progression in CLL.

BLADDER CANCER – DISEASE OF THE ELDERLY?

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Objectives. Introduction. Bladder cancer (BC) is one of the leading causes of mortality with 437 000 new cases and 186 000 deaths diagnosed in 2016 globally. Mostly it affects men and is a disease that presents itself in elderly population. Although 75% of BC patients are older than 65 years, rarely it can be diagnosed in younger adults or even children. From 2010–2019 there were only 10 cases of BC in the age group 20–24 in Latvia. Painless hematuria and voiding problems are the most common symptoms of BC.

Case report. A 20-year-old man presented in an outpatient clinic with a one-year history of progressing incomplete voiding sensation after urination. Patient has a history of orchiopexy due to left cryptorchidism. Patient has no family history of BC, but has been smoking a pack of cigarettes a day for 8 years and electronic cigarettes for the past year. Urologist assigned laboratory tests: complete blood count, urine culture, urine cytology and STD panel. There were no significant findings in these tests. Urine analysis showed leucocyturia. Abdominal ultrasonography showed a small (1.2 cm in diameter), intraluminal, fixed bladder wall mass. An abdominal and pelvic CT scan demonstrated no upper urinary tract involvement and no local or distant metastases. Then a cystoscopy was performed which revealed an exophytic bladder tumor on the left bladder wall close to the left ureter ostia. A transurethral bipolar resection of the bladder was performed with an *En-bloc* technique. Histopathology revealed urothelial, papillary, non-invasive, low grade carcinoma, cTaN0M0. Patient currently has no complaints and is under oncologic surveillance pending 3 month follow-up cystoscopy.

Conclusions. Even though bladder cancer in younger individuals is rare, persistent LUTS in young adults should be taken seriously and carefully examined. and in combination with thorough risk factor evaluation leads to a good prognosis.

CHRONIC LYMPHOCYTIC LEUKAEMIA-ASSOCIATED EXPANSION OF T FOLLICULAR HELPER AND T FOLLICULAR REGULATORY CELLS IS NORMALISED IN PATIENTS RECEIVING CHEMOTHERAPY

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Objectives. Infections are a significant cause of morbidity and mortality in chronic lymphocytic leukaemia (CLL), however, specific mechanisms that underlie dysregulated immunity in CLL remain largely uncharacterized. The quality of B cell response to infection and vaccination is fine-tuned by specialized subsets of T cells that promote (T follicular helper, Tfh) or suppress (T follicular regulatory, Tfr) antibody production. We determined circulating Tfh and Tfr frequencies and absolute numbers in CLL patients that were untreated (Unt-CLL) or received chemotherapy (ChTx-CLL). We further interrogated immunoglobulin (Ig) levels as a surrogate marker for productive B cell responses.

Materials and Methods. In a cross-sectional study peripheral blood was collected from Unt-CLL (n = 19) and ChTx-CLL (n = 7) patients and age-matched healthy controls (HC, n = 14). Flow cytometry was used to determine Tfh (CD3⁺CD4⁺CD45RA-CXCR5⁺) and Tfr (CD3⁺CD4⁺CD45RA-CXCR5⁺FOXP3⁺) frequencies. IgA, IgG, and IgM levels were assessed in serum by immunoturbidimetry. Flow cytometry data were analyzed using FlowJo v10.8 software and nonparametric statistical analysis conducted in GraphPad Prism 9.4.

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Results. While the abundance of both Tfh and Tfr cells was comparable in ChTx-CLL patients and HCs, these T cell subsets were significantly elevated in Unt-CLL compared to HCs. Unexpectedly, in Unt-CLL we also found negative correlations between IgA and both Tfh and Tfr frequencies; this was unique to the IgA antibody class.

Conclusions. CLL patients present with an expansion of Tfh and Tfr cells that is apparently normalised by chemotherapy. The negative correlation between IgA antibody levels and Tfh cells in Unt-CLL patients suggests that, despite their expansion, Tfh cells are dysfunctional. Indeed, it has been postulated that in vivo Tfh-CLL B cell interactions support malignant B cell expansion and impede normal B cell responses; our future work will address the mechanisms by which this occurs.

CLASSIFICATION OF HIGH-GRADE CIN BY KI-67 STATUS – CONSIDERABLE PROGNOSTIC FACTOR IN PERSONALLY TAILORED MANAGEMENT

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Objectives. High-grade cervical intraepithelial neoplasia (CIN2 and CIN3) represent a heterogeneous disease with varying cancer progression risks. In current practice, all CIN3 and the majority of CIN2 lesions are treated in order to prevent progression to cervical cancer. However, spontaneous regression of CIN2 and CIN3 naturally occurs, but if treated according current guidelines this would constitute overtreatment. Biomarker Ki-67 indicative for a cellular proliferation could provide guidance for clinical management in women with high-grade CIN.

Materials and Methods. A cross-sectional study that enrolled a total of 110 women aged 18–65 with abnormal cytology referred for colposcopy to Reference Colposcopy Centre in Riga East Clinical University Hospital in July 2016–July 2017. Histological evaluation of cervical biopsy samples taken under colposcopy control was performed to each patient and all specimens were examined for Ki67 expression through IHC technique. The cumulative score of immunohistochemical expression Ki-67 (score 0–3), referred to as the “immunoscore” (IS), in the corresponding cervical scrape were evaluated.

Results. In the total group of CIN2/3 lesions (79 cases), 5 lesions were classified as IS group 0–2 (6.0%), 24 lesions as IS group 3–4 (30.4%) and 50 lesions as IS group 5–6 (63.6%), confirming heterogeneity within high-grade CIN lesions. Increasing Ki-67 expression was associated with increasing CIN grade ($p < 0.05$).

Conclusions. We have found a significant heterogeneity in the expression of Ki-67 in high-grade CIN lesions. Additional use of Ki-67 biomarker with classical histology interpretation complete each other to reach the higher accuracy on diagnosis of high-grade CIN, might help detect the prognosis and more personalized management so preventing overtreatment, especially in young women.

CLINICAL CHARACTERISTICS OF PATIENTS WITH STAGE II AND STAGE III RECTAL CANCER AND COMPLETE RESPONSE AFTER NEOADJUVANT THERAPY

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Objectives. Standard treatment for stage II and III rectal adenocarcinoma (RA) includes neoadjuvant therapy (NAT) followed by surgery. NAT plays a vital role in reducing the size and spread of RA. In 10–20% of cases, a complete clinical response of the RA is observed after NAT. These cases create an opportunity for an alternative treatment plan – the “watch and wait” strategy.

Materials and Methods. A retrospective study from the year 2015 to 2021 (6 years). Patients with stage II and III RA who received NAT and had a complete clinical (cCR) or pathological response (pCR) after treatment were included.

Results. From 298 patients who received NAT, 26 were selected – 10 had a cCR, and a “watch and wait” strategy was applied, 16 underwent radical surgical treatment and a pCR was found. Mean age – 66.9 years. Gender – 16 female, 10 male. Clinical stages of the RA: stage II – 4, stage III – 22. T stage status: T2–10, T3–15, T4–1. Nodal status: N0–6, N1–13, N2–7. RA differentiation: G1–11, G2–14, carcinoma in situ – 3. Average RA distance from anal verge: 6.7 cm. The longest dimension of the RA: min 1.5 cm, max 10 cm (average 4.9 cm). Radiotherapy dose applied: for RA in 1.8 Gy fractions up to 50.4Gy–52.2 Gy; pelvic lymph nodes 45–46.8 Gy, additional lymph node groups – 30.6–37.8 Gy. Chemotherapy applied: 5-FU–21, other – 4, none – 1. The time from the end of radiotherapy to the control MRI of the small pelvis – min 4 weeks, max 14 weeks (avg. 8.3 weeks). Oncomarkers before NAT were elevated in 4 patients – CEA in 3 cases, CA 19-9 in 1 case.

Conclusions. The rate of complete RA response in our study was 8.7% – cCR 3.3%, 5.4% pCR. RA was mainly located in the distal or middle third of the rectum. Pre-treatment node positivity didn't exclude the possibility of a complete response.

CONTROLATERAL BREAST CANCER AND OVARIAN CANCER RISKS IN CASES WITH PRIMARY BREAST CANCER AND BRCA1 PATHOGENIC VARIANTS C.5266DUP OR C.4039DEL

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Objectives. Women with germ-line pathogenic variant (PV) of *BRCA1* and primary breast cancer (PBC) face significant future risks of contralateral breast cancer (CBC) as well as ovarian cancer (OC).

Data from previous published studies have suggested that individual breast and ovarian cancer risks could be modified by mutation position in the *BRCA1* gene. Founder variant c.5266dup has been associated with higher breast/ovarian cancer risk ratio than variant c.4039del.

In this study we aim to test if there is any difference in CBC and OC risks between two founder *BRCA1* variants in the setting of PBC

Materials and Methods. 373 cases with PBC in stage 1–3 and *BRCA1* pathogenic founder variant c.5266dup or c.4039del were followed up in time frame from year 1986 to year 2023. The follow-up finished when event of CBC or OC occurred and case was censored if no event occurred till the end of follow up, death or prophylactic surgery (risk reducing contralateral mastectomy or bilateral salpingo-oophorectomy), whichever occurred first.

Kaplan-Mier statistics method was used to calculate and compare risks.

Results. A total of 373 cases were enrolled in study, 242 with PV c.5266dup and 131 with PV c.4039del. Mean follow-up time was 8.2 (\pm 1.1, 95% CI) years for CBC and 7.9 (\pm 1.0, 95% CI) years for OC group. There were 41 CBC cases and 26 OC cases observed.

10 and 20 year cumulative risk was 21.4% and 44.2% for CBC, 12.6% and 25.6% for OC. There was no statistically significant difference between PV c.5266dup and c.4039del in risks of CBC (Log-rank p = 0.801) or OC (Log-rank p = 0.224)

Conclusions. In the case of PBC, this study does not support any significant difference in future CBC and OC risks between *BRCA1* PV c.5266dup and c.4039del.

CORRELATION BETWEEN COLLAGEN FIBER MORPHOMETRIC PARAMETERS AND AGGRESSIVENESS OF BREAST CANCER

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Objectives. The extracellular matrix (ECM) plays a key role in tumor progression in breast cancer (BCa). The latest results show the connection between ECM characteristics and an increase of BCa aggressiveness, including the start of the metastasizing process. Hence, there is a lack of statistically significant information about the role of morphometric parameters of collagen matrix and their role in the formation of the aggressive course of BCa.

Materials and Methods. The study was performed on tumor tissue samples: 60 patients with stage I-II BCa who were treated at the Kyiv Clinical Oncology Center during 2013–2015. The identification of collagen in the tissue of breast neoplasms was carried out by histochemical method according to Mallory. Morphometric studies were performed using the software CurveAlign v. 4.0. beta and ImageJ. Statistical analysis of the results was performed using the GraphPad Prism v.8.0 program (GraphPad Software Inc., USA).

Results. It has been demonstrated, that an average fiber length is decreasing in relation to patient nodal metastasis status ($p < 0.0001$), decreasing G-stage ($p < 0.0001$), and increasing patient's age ($p < 0.005$). A tendency with width changes was the same. It has been proved, that patients with higher age ($p < 0.05$), T- ($p < 0.0001$), N- ($p < 0.0001$), and G-stage ($p < 0.005$) had thicker collagen fibers. It has been shown, that fibers were more straight in patients with nodal metastasis ($p < 0.05$). Also, general fiber density has been increasing with the growing of T- ($p < 0.05$), N- ($p < 0.0001$), and G-stage ($p < 0.0001$) of Bca, and decreased in patients older than 45 years ($p < 0.05$).

Conclusions. Demonstrated results proved the role of collagen matrix in the progression of BCa. With the growth of tumor aggressiveness, collagen fibers become shorter, thicker, and straighter. In addition, their general density increased as well. Developing new methods and techniques for ECM structural changes study could assure obtaining of newel informational attributes for the improvement of diagnosis and prognosis of BCa.

CORRELATION BETWEEN EXPRESSION OF OPN AND ON IN TUMOUR TISSUE AND CIRCULATING CYTOKINES IN PATIENTS WITH BREAST CANCER

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Objectives. According to the latest data of experimental and clinical studies, bone tissue remodeling proteins, in particular, osteopontin (OPN) and osteonectin (ON) are considered to be metastatic related. At the same time, the results of clinical observations regarding the importance of these proteins in predicting breast cancer (BC) course are not always unambiguous. In recent years, there have been isolated reports that some cytokines (IL-1, IL-6, IL-8, IL-17), are able to increase the production of bone remodeling markers. At the same time, the mechanisms of these violations are not definitively known. Taking into account the above, the aim of the work was a comparative study between the indicators of OPN and ON in tissue samples of BC patients, considering the level of cytokines in blood serum.

Materials and Methods. The levels of mRNAs in tissue samples were estimated by RT-PCR in real time. Levels of serum IL-6 and -10 were estimated by ELISA immunoassay. The protein expression was evaluated using the immunohistochemical method. The study was conducted on 50 tumor and serum samples from BC patients.

Results. It was found that in patients with high levels of OPN and ON in the breast cancer tissue, IL-6 mRNA levels were 1.69 and 1.44 times higher, respectively, compared to patients with low level of mentioned proteins. Indicators of serum IL-6 at the protein level were in 1.63 and 1.29 times higher in patients with BC with OPN and ON expression > 100 H-Score points. For serum IL-10, we found an association with a high level of OPN (−0.51).

Conclusions. Levels of circulating IL-6 and IL-10 are associated with OPN and ON indicators in the tumor tissue of patients with breast cancer. At the same time, the correlation between the level of these cytokines in the blood of patients and the features of breast cancer course requires further research.

DETECTION OF PROSTATE CANCER RECURRENCE AFTER RADIATION THERAPY – FIRST EXPERIENCE

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Objectives. Radiation therapy is one of the standard radical treatment methods for localised prostate cancer (PCa). Around 20–30% of patients develop a biochemical and subsequently a clinical recurrence. Early detection of local recurrence facilitates additional focal treatment. Our objective is to evaluate detection of early recurrence using MRI and MRI – Fusion guided biopsies when PSA is in the range 1.0–2.0 ng/mL over nadir.

Materials and Methods. We performed a prospective study by re-staging evaluation for patients with a PSA > 1.0 ng/mL over nadir with a multi multiparametric prostate MRI, abdominal CT, and bone scintigraphy. The patients were divided into two groups according to the PSA value: 1.0–2.0 ng/mL and > 2.0 ng/mL. Patients with a positive MRI finding (PIRADS III–V) underwent an MRI – fusion guided transperineal prostate biopsy.

Results. The cohort of 45 patients was analysed. Mean age is 72.8 years, and PSA value from 1.01 to 21.9 ng/mL. We have 17 patients in the first group and 28 patients in the second group.

In the first group MRI was positive in 14 cases (82%). The most common finding was PIRADS 5 lesions in 5 cases, PIRADS 4 in 4 cases, and other were PIRADS 3 lesions. And the MRI-Fusion biopsy was positive in 14 out of 17 cases (82%). 9 out of 14 (64%) cases had ISUP grade 5 or 6.

In the second group all MRI results were suspicious for PCa recurrence. The majority: 16 (57%) had PIRADS 4 or 5 lesions. The following biopsy was positive in 27 (96%) cases and 13 of them (48%) had ISUP grade 3–6.

Conclusions. The first experience shows promising results for early detection of recurrent PCa after radiotherapy using MRI and MRI-Fusion guided biopsies for patients with a PSA rise 1.0–2.0 ng/mL over nadir. Further data collection is needed to stratify the results.

DETECTION RATE OF PROSTATE CANCER IN SYSTEMATIC COMPARED TO TARGETED CORES BY TRANSPERINEAL TARGETED MRI FUSION PROSTATE BIOPSY IN PATIENTS WITH A HISTORY OF NEGATIVE TRANSRECTAL PROSTATE BIOPSY

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Objectives. Nowadays a targeted transperineal MRI Fusion prostate biopsy is a technique of choice in the verification of prostate cancer recommended by the European Association of Urology. There is still a debate about the most accurate biopsy protocol. The objective of the study is to verify if targeted cores (TC) are sufficient enough to precisely diagnose prostate cancer in patients with a history of negative transrectal biopsies.

Materials and Methods. A retrospective study – one center experience. The study included patients who underwent a transperineal soft-ware MRI/US Fusion biopsy from year 2019 to 2022. The patients had a history of negative transrectal prostate biopsy and prior to the transperineal biopsy underwent an mpMRI with a PIRADS 3 score and higher.

Results. A total of 120 patients data were analyzed. A mean age 66 y (range 48–83), PSA 12.72 ng/mL (1.36–82), PSAD 0.26 (0.04–1.6), prior biopsies 1.45 (1–5), time from last biopsy 26.1 mo (2–108). Prostate cancer was detected in 76 patients (65%) of which 54 cases (71.05%) were positive in TC only, 22 (28.95%) in both TC and SC. Comparing ISUP Grade between TC and SC in 22 patients, grade was higher in targeted cores in 13 patients (59.09%), identical grade in 8 patients (36.36%), lower grade in 1 patient (4.55%). In 2 cases (1.7%) prostate cancer was detected only by SC. Mean number of SC were 9.07 (range 3–27).

Conclusions. Our study results show that SC can be omitted during targeted transperineal MRI Fusion biopsy in patients with prior negative transrectal biopsy. It does not affect the overall detection rate of clinically significant prostate cancer.

DIFFERENTIAL EXPRESSION PATTERN OF GENES MRPS18 FAMILY IN PROSTATE CANCER PATIENTS

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Objectives. The evolution of research on the therapy of prostate cancer (PC) depends on a study of molecules that are controlling progression of this disease. Nevertheless, there is a need for additional biomarkers that would help to refine the molecular profile of PC and propose the personalized therapeutic approach.

Materials and Methods. The aim of the present study was to analyse differential expression patterns of the MRPS18 family genes in blood sera and tumor tissue of patients with PC, characterized by a different Gleason score. The total extracellular RNA was isolated from blood sera of 44 PC patients and 4 healthy donors followed by qPCR analysis. Immunohistochemical study of the MRPS18 family proteins performed on deparaffinized sections of tumor tissues. The study was supplemented by a bioinformatic analysis of the publicly available databases and the statistical analysis, using a GraphPad Prism software.

Results. Extracellular mRNA level of *MRPS18-2* was increased in all PC samples compared to the healthy donors but without significant inequality between the groups of PC with the different Gleason score. The highest levels of *MRPS18-1* and *MRPS183* were detected in the samples from PC patients with the Gleason score > 9. From the three genes of the MRPS18 family showed similar pattern of expression assessed either by extracellular mRNA levels in patient sera or the protein in tumor tissues of PC patients.

Conclusions. There is a direct positive correlation between the expression level of *MRPS18 (1-3)* genes determined by qPCR in blood sera and the expression level of S18 (1-3) proteins determined by immunohistochemical examination in tumor tissues of PC patients. Expression levels of MRPS18 family genes in the PC patient sera may be used as an additional criterion for prognosis of tumor progression.

EARLY RECURRENCE AFTER LIVER RESECTION IN PATIENTS WITH COLORECTAL CANCER LIVER METASTASES

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Objectives. Colorectal cancer is the second leading cause for cancer associated deaths worldwide, with 25–30% of those affected developing liver metastases. After curative surgery, 70% will develop recurrence within first two years after resection. The aim of this single center retrospective study was to determine the incidence of metastatic disease-free state one year after curative resection in association with known risk factors for recurrence.

Materials and Methods. There were 34 patients included in the study and divided into two groups regarding one year recurrence of colorectal cancer metastases after liver resection. Known risk factors of colorectal cancer liver metastases recurrence were analyzed between the two groups.

Results. There was 47% recurrence rate one year after the liver resection. In the one year recurrence group 64.7% were male and 35.3% were female, in disease free group 52.9% were male and 47.1% were female ($p = 0.486$). The mean age in recurrence group was 63.6 ± 12.9 and in disease free group 61.5 ± 10.9 , ($p = 0.361$). The mean time from first surgery till first liver metastasis was 5.6 ± 7.5 months in recurrence group and 12.3 ± 15.5 in disease free group ($p = 0.928$). There were 1.8 ± 1.3 metastases in recurrence group and 1.6 ± 0.7 in disease free group ($p = 0.930$), with the mean size being 29.2 ± 14.0 mm vs 29.4 ± 11.4 mm respectively ($p = 0.679$). The Neu/Ly ratio was 3.6 ± 2.5 in recurrence group vs 3.3 ± 4.8 in disease free group ($p = 0.174$). There were 1.2 ± 1.0 positive lymph nodes in the initial colorectal specimen of recurrence group and 0.6 ± 1.3 in disease free group ($p = 0.253$). There was statistically significant difference between CEA levels a year after liver metastasis resection in recurrence group and in disease free group 21.72 vs 12.56 respectively ($p = 0.05$).

Conclusions. Early recurrence remains a major issue in patients after liver resection for colorectal cancer metastases. CEA levels one year after resection were lower in disease free group. A study with a larger patient population is necessary for more relevant results.

EVOLUTION OF B12 VITAMIN BLOOD LEVEL IN PATIENTS WITH MYELOMA, LYMPHOCYTIC LEUKEMIA AND MYELOBLASTIC LEUKEMIA IN LATVIA

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Objectives. B12 blood level in patients with myeloma (C90 - International Classification of Diseases (ICD-10)), lymphocytic leukemia (C91) and myeloblastic leukemia (C92) were studied prior and after the diagnosis.

Materials and Methods. Studies of patient clinical histories yielded few patients with B12 tests. Study of B12 dynamics from clinical histories was deemed resource consuming. There were 7433 patients with diagnosis C90-92 in the clinical test data collected by E. Gulbis laboratory (EGL) over years 2004-2022. From these 7433 patients 1386 had one B12 test, two- 548, three and more- 864 patients. There are on average 107, 189 and 91 confirmed cases of C90, C91 and C92 per annum in Latvia. EGL data set has 30% more C90-92 patients, most probably due to suspected but later unconfirmed diagnosis.

Results. Anonymized patient data for 7451 patients with C90-C92 diagnosis for the period of 10 years before and after the first diagnosis were studied. The strongest time dependency of B12 blood level changes was observed for C92 diagnosis where within approximately 3 years prior to diagnosis there were more patients with high and very high B12 level than those with B12 level within the reference interval. The B12 fluctuation for C92 patients was expected because in myeloblastic leukemia there is overproduction of cells from myeloid hemopoietic progenitor which includes granulocytes, and they produce B12 binding molecules transcobalamins. C90 and C91 patient data also showed B12 level changes around the diagnosis date although the effect was considerably smaller.

Conclusions. In silica analysis of B12 tests of C90, C91 and C92 patients over years 2004-2022 showed very strong B12 blood level change prior to diagnosis date for C92 and considerably smaller but still clearly visible change for C91 and C90 patients. The changes of B12 level after diagnosis were also observed.

EXPRESSION PATTERN OF EXTRACELLULAR MATRIX GENES IN BENIGN AND MALIGNANT NEOPLASMS OF THE PROSTATE GLAND

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Objectives. Prostate cancer (PCa) is the second most common malignancy and the fifth leading cause of cancer-related death among men worldwide. Existing screening studies are carried out using a number of clinical, radiological and laboratory tests, which make it possible to ascertain the presence of PCa already at the stage of its clinical manifestations. Despite, the criteria for early diagnosis and prognosis of benign prostatic hyperplasia (BPH) and PCa have not yet been definitively established. In this direction, it should be considered appropriate to define new markers that, independently or in combination with other known indicators, could reveal additional mechanisms of tumor growth. Thus, the aim of our research was to identify a panel of molecular genetic and epigenetic biomarkers associated with the development of prostate cancer, based on the study of extracellular matrix genes in the tissue of benign and malignant neoplasms.

Materials and Methods. The levels of microRNAs and mRNAs in tissue samples from PCa and BPH patients were estimated by RT-PCR in real time. The study was conducted on 50 tumor samples from PCa patients and 30 BHP patients.

Results. Using bioinformatical approaches, we choose to examine expression of genes, involved in tumor microenvironment formation, namely SPP1, SPARC, MMP-1 and MMP-8, as well as miRNAs, involved in their regulation. We established that the levels of expression of SPARC, MMP-1 and MMP-8 mRNA in the PCa tissue were 77.6, 5.4 – and 2.9-fold higher, respectively, than in BPH tissue. Higher indicators of hsa-mir-146a-5p (1.6-fold) and lower levels of hsa-mir-181a-5p (1.7-fold) were detected in PCa samples. An inverse correlation between the levels of hsa-mir-181a-5p and SPARC mRNA in PCa and BHP samples ($r = -0.55$ and -0.61 , respectively) were established.

Conclusions. Association of SPARC, MMP-1, MMP-8, and hsa-mir-181a-5p, with cancerogenesis in prostate gland was revealed. Involvement of mentioned molecules in tumor formation was established and requires further examination.

EXPRESSION PATTERN OF MRPS18 FAMILY OF GENES IN MEDULLOBLASTOMAS

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Objectives. Medulloblastoma (MB) is the most frequent form of embryonal brain tumors. According to statistical data, up to 70% of cases of MB are reported in children at age under 10 years old. There are several histopathological and molecular subtypes of MB, which are differ in its proliferative potential and metastatic capabilities, that altogether impact on aggressiveness of a clinical course. That is why a search for additional personalized biomarkers is a prominent task. The aim of the present study was to analyse the expression patterns of the MRPS18 family on mRNA levels in blood serum and tumor tissue of patients with MB.

Materials and Methods. The total RNA was isolated from blood serum and tumor tissue samples obtained from 9 patients with MB. Relative mRNA expression levels of target genes were determined, using qPCR analysis. Data were calculated using $2^{-\Delta\Delta C_t}$ method and statistically estimated, using a GraphPad Prism software.

Results. The obtained data revealed differences in mRNA expression pattern of MRPS18 family genes. Relative expression levels of *MRPS18-1* in tissue and sera were quite similar. While expression patterns of *MRPS18-2* and *-3* in tissues and sera were approaching the different directions. In addition, expression levels of *MRPS18-1* and *-3* in tissue were similar, while the *MRPS18-2* expression level was approximately 20% lower. At the same time, such analysis in sera revealed that the realive expression level of *MRPS18-3* was up to 6 folds lower, compared to equal expression levels of *MRPS18-1* and *-2*.

Conclusions. The obtained data on differential patterns of mRNA expression of MRPS18 family genes hints to consider MRPS18 genes as putative tumor markers and indicate feasibility of future studying of protein expression patterns.

FOCAL THERAPY OPTIONS IN TREATMENT OF PRIMARY LOCALISED PROSTATE CANCER: LITERATURE REVIEW

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Objectives. Prostate cancer (PCa) diagnosis and treatment have improved since the end of 1980s, starting with early detection possible through PSA testing leading to multiparametric MRI and transperineal biopsy. Primary localized PCa patients have two main treatment strategies: active surveillance or radical treatment (surgery or external beam radiation). Both options impact patients' compliance, anxiety, quality of life, and carry the risk of complications. Focal therapy offers active treatment with reduced treatment toxicity and acceptable oncological outcomes.

Materials and Methods. We reviewed the literature on two focal therapy methods – cryoablation and high-intensity focused ultrasound (HIFU), including their descriptions, outcomes, and complications.

Results. Over the last two decades, focal therapy treatment has been continuously reviewed.

At this point, HIFU studies show two treatment strategies: full gland ablation and focal ablation. Full gland ablation with HIFU in patients with low- to medium-risk cancer has a long-term effect and a survival rate of 10–15 years. Focal HIFU has promising results for localized PCa in the medium term. Cryotherapy studies of low- to intermediate-risk localized PCa also show promising results for both whole gland and focal ablation in the medium term. Some studies have evaluated functional indicators in addition to oncological indicators. Complications after HIFU therapy are often minor and insignificant, with 93–95% of patients being continent 12 months after focal HIFU therapy. Cryotherapy has a similar rate of continence, with 90.5% of patients being continent during the 12-month follow-up period. Erectile function is preserved in over half of cases (69–80%) after focal therapy.

Conclusions. Focal therapy aims to preserve healthy tissue and treat the tumor, while maintaining good functional and oncological outcomes. HIFU is a viable option for focal therapy, offering a range of treatment strategies from focal to complete gland ablation. Focal therapy will have an important role in the treatment of localized PCa in next few years.

GENE EXPRESSION PATTERNS AS USEFUL BIOMARKERS FOR TNBC PATIENTS

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Objectives. Triple negative breast cancer (TNBC) is a breast cancer subtype characterised by lack of estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor (HER2) with considerably worse prognosis than other cancer types. TNBC accounts for 10–15% of all breast cancer cases with aggressive clinical behaviour such as high relapse rates and increased metastatic potential. Due to lack of molecular targets these patients don't respond to hormonal or HER2 therapies and chemotherapy remains the only treatment option for those patients.

Considering development of innovative new treatment options there is a need to identify new biomarkers stratification of different TNBC subtypes to recruit patients for the best treatment option available based on their biomarker profile. The aim of this study was to identify TNBC specific tumour gene expression profiles, which would serve as biomarkers.

Materials and Methods. 19 breast cancer transcriptomes were sequenced using Illumina platform. Based on gene expression results the TNBC subgroup of 5 was identified and compared to non-TNBC group, to identify differentially expressed genes (DEGs). Gene ontology (GO) enrichment analysis was conducted using ToppGene tool. Afterwards STRING online database was used for protein-protein interaction (PPI) network construction. Cytohubba and MCODE plug-in was used to screen functional modules and hub genes.

Results. In total 229 DEGs were identified by differential gene expression analysis in the TNBC group compared to non-TNBC type. Eight hub genes – *FOXA1*, *ESR1*, *TFF1*, *GATA3*, *TFF3*, *AR*, *SLC39A6*, *COL9A1* were screened out from the PPI network.

Conclusions. This study suggests that gene expression patterns for TNBC subtype provide useful information for targeted, biomarker driven therapy options. *AR* gene expression pattern (up- or downregulated) would be promising biomarker to identify patients legible for anti-androgen therapy. Other 7 identified gene expression patterns may provide useful information in combination with conventional immunohistological markers, genomic and epigenomic markers.

GERMLINE MUTATIONS AND COPY NUMBER VARIATIONS IN BRCA1/2 OF OVARIAN CANCER PATIENTS

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Objectives. Preferred treatment and prognosis differ for patients with sporadic or hereditary ovarian cancer. Genetic testing is of most importance and is usually done for patients that fit specific criteria. Methods include sequencing of founder variants or next generation sequencing of BRCA1 and BRCA2 exonic regions.

Materials and Methods. DNA was extracted from 192 ovarian cancer patient blood samples using column based DNA extraction method. BRCA1 and BRCA2 gene exonic regions were sequenced using NGS AmpliSeq for Illumina using BRCA Panel. 93 Samples underwent CNV analysis, positive findings were confirmed using MRC-Holland MLPA with BRCA1 un BRCA2 probemixes.

Results. NGS was performed for 192 samples. 93 samples underwent CNV analysis. Pathogenic/likely pathogenic variants in BRCA1 were detected in 31 sample (16.3%) and 7 samples (3.7%) in BRCA2 gene. 55.3% of detected variants were among 6 most prevalent founder mutations in Latvian population. Type of alteration was determined. CNVs were detected in 2 cases – 1 in BRCA1 and 1 and 1 in BRCA2 gene.

Conclusions. Next generation sequencing might prove to be more cost-effective for pathogenic BRCA1/2 variant detection in ovarian cancer patients. Point mutations are more common although additional CNV analysis should be done to determine larger deletions.

HPV 16 E6 BASED DNA IMMUNISATION HINDERS GROWTH AND METASTATIC ACTIVITY OF E6/E7 EXPRESSING CANCER CELLS BY INDUCING SPECIFIC CD4+ T CELL RESPONSE AND REDUCING THE INFLAMMATORY BACKGROUND

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Objectives. Human papillomaviruses are responsible for > 95% of cervical cancer (CC) cases, major risk factor is infection with HPV genotype 16 (HPV16). While HPV infections and associated cancers are preventable by prophylactic HPV vaccines, there is a need for therapeutic vaccine(s) to treat chronic HPV infections and associated CC. Promising vaccine components are viral oncoproteins E6/E7. Our aim was to evaluate immunogenicity in mice of DNA-immunogens encoding consensus HPV16 E6 and E7 and evaluate their potential to protect mice against E6/E7-expressing tumors.

Materials and Methods. Consensus sequence of E6/E7 genes of HPV16 was obtained after sequencing viral isolates from CC patients. DNA-immunogens were constructed by cloning E6- and E7-encoding DNA into eukaryotic expression vector pVax. Groups of BALB/c (n = 5) mice were immunized with pVax1, or pVaxE6, or pVaxE7, or both administered as separate injections, and challenged by subcutaneous injections of murine adenocarcinoma 4T1luc2 cells made to express E6/E7. Assessment of immune response and tumor challenge were performed as described earlier (<https://pubmed.ncbi.nlm.nih.gov/36612231/>).

Results. We detected CD4+ T-cell response against E6 with potential immune escape mutation R17G, but no E7-specific T-cell responses. Also, non-stimulated splenocytes of E6-immunized mice secreted IFN- γ and IL-2, whereas E7-immunized mice, only TNF- α indicating immune activation versus inflammation. E6-immunization caused reduction in tumor size and weight. Both E6- and E7-immunizations reduced the number of liver metastases. E6 also reduced organ infiltration by tumor cells, specifically, infiltration into lungs, the main site of metastatic activity in CC. Interestingly, E6-immunization restricted growth and metastatic activity of both E6/E7-expressing and parental adenocarcinoma cells.

Conclusions. The effect of E6 DNA-immunization may result from combination of innate and adaptive T-cell response to E6. The latter would explain therapeutic effect of E6-vaccination in the absence of detectable specific immune response observed in clinical trials. Our results are important for the design of therapeutic HPV vaccines. Supported by FLPP project lzp-2021/1-0484.

IDENTIFYING GENETIC FACTORS ASSOCIATED WITH BREAST OR OVARIAN CANCER RISK IN BRCA1 PATHOGENIC VARIANT CARRIERS

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Objectives. Breast and/or ovarian cancer risk for germline *BRCA1* pathogenic variant carriers differ by individual and is affected by genetic factors. The aim of this study is to explore genetic factors that might modulate breast and/or ovarian cancer risk in *BRCA1* pathogenic variant carriers.

Materials and Methods. We selected 406 carriers of one of the most common *BRCA1* pathogenic variants (c.4035del or c.5266dup) in the clinical cohort of Latvia. This cohort consisted of 171 breast and 121 ovarian cancer patients, respectively, and 114 controls. We performed a genome-wide association analysis in these individuals, followed by functional annotations of the most significantly associated single nucleotide variants (SNVs).

Results. In breast cancer patients, the most significantly associated SNV was rs2609813 ($P = 2.33 \times 10^{-7}$, OR = 0.28). The variant is intronic in the *FAM107B* protein coding gene. The second most significant breast cancer associated SNV was rs4688094 ($P = 7.76 \times 10^{-7}$, OR = 0.38) and the most significant ovarian cancer SNV was rs79732499 ($P = 1.38 \times 10^{-7}$, OR = 0.00031), and both are located in the non-coding genome.

Conclusions. The results of this study can be used as preliminary data for a more comprehensive study and might contribute to customized polygenic risk score development for *BRCA1* pathogenic variant carriers.

MELANOMA AND NON-MELANOMA SKIN CANCER LOCALISED ON THE FACE

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Objectives. During the period of COVID-19, it is mandatory in all medical establishments in Latvia to put on medical face masks. The part of the face covered by medical mask is the localization of regular insolation and UV damage. The aim of this work is to prove the significance of proper clinical examination of skin at every visit to a dermatologist. If an elderly patient visits a dermatologist in an out-patients clinic, due to a fungal infection of toenails, or psoriasis with lesions localized on the palms and soles, not always the patient is asked to take the facial mask off, at risk of COVID-19 infection, to examine the face as well. Development of pigmented spots is characteristic of elderly patients, usually neglecting them.

Materials and Methods. In the Clinical Centre of Skin and STD, Rīga 1st hospital 10 dermatologists were interviewed concerning 3-year period of mandatory wearing of face masks due to COVID-19 restrictions.

Results. In total 4 cases of superficially spreading melanoma, 2 cases of lentigo maligna melanoma, 19 – BCCs, and 12 – squamous cell skin cancers were diagnosed by dermatologists on the facial skin of nasal areas, cheeks, and chin, also mucous membranes of oral cavity, mandatory covered by face mask during the visit. In the period of active COVID 19 infection dermatologists, specialty residents and students are at increased risk in work with patients. Clinical signs of viral, bacterial, and fungal infections, lichen, pemphigus were spotted, confirmed by lab methods, and treated according to the guidelines. Every patient with diagnosed melanoma or non-melanoma skin cancer was referred to an oncologist via “green corridor”.

Conclusions. Correct clinical examination of the covered by medical mask patient’s skin and mucous membranes in oral cavity are crucial in timely diagnostics of skin cancer in prone to UV-caused damage facial skin.

MIR-125B-2, -155, -221, AND -320A AS PREDICTIVE MARKERS OF TAMOXIFEN RESISTANCE IN BREAST CANCER PATIENTS

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Objectives. According to the latest data of experimental and clinical studies, bone tissue remodeling proteins, in particular, osteopontin (OPN) and osteonectin (ON) are considered to be metastatic related. At the same time, the results of clinical observations regarding the importance of these proteins in predicting breast cancer course are not always unambiguous. In recent years, there have been isolated reports that some cytokines (IL-1, IL-6, IL-8, IL-17), are able to increase the production of bone remodeling markers. At the same time, the mechanisms of these violations are not definitively known. Taking into account the above, the aim of the work was a comparative study between the indicators of osteopontin (OPN) and osteonectin (ON) in tissue samples of patients with breast cancer, considering the level of cytokines in blood serum

Materials and Methods. We analyzed the expression levels of miR-125b-2, -155, -221, -320a in biopsy samples of 35 breast cancer patients using real-time polymerase chain reaction depending on their response to tamoxifen treatment.

Results. We estimated miR-125b-2, -155, -221, and -320a expression in BC biopsy samples before treatment and compared them with the results of NHT tamoxifen therapy. Sensitive tumors exposed higher levels of miR-125b-2 and miR-320a. Also, we observed strong correlation of mir-221 with RECIST percentage ($r = 0.57$), however, reliable differences between sensitive and resistant sample were not established.

Conclusions. Thus, obtained results prove that levels of miR-125b-2, -221, -320a in BC tissue are associated with tamoxifen sensitivity and have potential to become predictive biomarkers of breast cancer course

MODULATION OF MICRORNAS AND TRNA-DERIVED NCRNAS EXPRESSION LEVELS AFTER ASBESTIFORM FIBERS EXPOSURE IN MESOTHELIAL AND MESOTHELIOMA CELL LINES

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Objectives. Fluoro-edenite (FE) is a silicate mineral identified in the lavic products of Monte Calvario from stone quarries located in the southeast of Biancavilla (Sicily, Italy). The FE fibers have been classified as carcinogenic to humans by the IARC. Inhalation of FE fibers has been associated with a higher incidence of Malignant Mesothelioma (MM) cancer. An early diagnosis of MM, and a comprehensive health monitoring of the patients exposed to FE fibers are two clinical issues that may be solved by the identification of specific biomarkers. The aim of the study was to report microRNA (miRNA) and transfer RNA-derived non coding RNA (tRNA-derived ncRNA) transcriptome in human normal mesothelial (MeT-5A) and malignant mesothelioma (JU77) cell lines exposed or not exposed to several concentration of FE fibers.

Materials and Methods. After FE exposure of MeT-5A and JU77, pellet have been collected for RNA-Seq transcriptome profiling. The raw counts obtained from the miRNA and tRNA-derived ncRNAs analyses were all harmonized together to have a single raw count matrix that can be used for the differential expression analysis. The impact of differentially expressed miRNAs on biological pathways was evaluated by using MITHrIL.

Results. Results seem to suggest that although differences in small ncRNA expression between treated and untreated MeT-5A were detected, major effects were observed in the JU77 cell line. The common population of differentially expressed miRNAs and tRNA-derived ncRNAs between the two cell lines increased with the exposure to FE fibers. When we compared miRNAs and tRNA-derived ncRNAs expression between unexposed vs. exposed MeT-5A the results showed several differentially expressed molecules. The results demonstrated clear patterns of negative and positive perturbation scores involving 39 different pathways.

Conclusions. Besides this amount of data, further studies will be designed for the selection of the most significant miRNAs and tRNA-derived ncRNAs to test and validate their diagnostic potential in high-risk individuals.

MUTATIONS WITHIN THE CHEMOKINE RECEPTOR CCR2 GENE CODING REGION IN PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA

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Objectives. Chronic lymphocytic leukemia (CLL) is a heterogeneous disease being aggressive or indolent. Earlier, applying multi-parameter flow cytometry analysis of peripheral blood (PB) CLL cells, we determined a correlation between the cell-surface expression of chemokine receptors *CCR1*, *CCR2* and the negative CLL prognostic marker CD38. Aim of this study was to identify mutations within the *CCR1* and *CCR2* genes in patients with different CD38 expression levels on leukemic cells.

Materials and Methods. PBMC DNAs of CLL patients were amplified (*CCR1*, 32 patients; *CCR2*, 76 patients). PCR products were cloned in *E.coli*, using pJET1.2 vector. Extracted plasmid DNAs were sequenced using Sanger sequencing. Sequences were analyzed against the reference sequences in NCBI database: *CCR1* RefSeq:NM_001295.2, *CCR2* RefSeq:NM_001123396.2. The study was funded by the projects: Lzp No.lzp-2018/1-0156 and RSU No.6-ZD- 22/14/2022.

Results. Within *CCR1*, we detected 93 variants, each of them was found once among 368 clones.

One mutation (303 T > del) in *CCR1* has been detected in 5 clones of 4 patients, two SNVs were detected in 9 clones of 3 patients. SNV rs146268408 was detected in 7 out of 11 clones of one patient (CD38-moderate), SNV rs943670629 was detected in 2 patients (CD38-moderate and CD38-positive), one clone for each patient.

In *CCR2*, 95 variants were detected once among 865 clones. 49% of *CCR2* clones (425/865 in 55 patients) contained at least one of eight identified repetitive SNVs.

Conclusions. Gene analyses depicted 2.3-fold higher random mutation rate in *CCR1* compared to *CCR2* (25.3 random variants within *CCR1* in 100 clones and 11.0 random variants within *CCR2* in 100 clones). Eight SNVs have been identified repeatedly within *CCR2*, one of the most frequent ones is classified as benign in the ClinVar database.

Further association of the identified *CCR2* repeated SNVs with the patient clinical course of the CLL disease will allow to assess the diagnostic significance of each variant.

REACTIVE STROMA AS A PROGNOSTIC MARKER FOR POOR CLINICAL OUTCOMES IN PROSTATE CANCER

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Objectives. Prostate cancer is the most common cancer detected among men and the second leading cause of male cancer death worldwide. The stromal microenvironment has emerged as a key player in the growth and development of cancer. **The aim:** to investigate the expression of cancer associated fibroblast markers (α -smooth muscle actin (α -SMA) and vimentin (Vim)) and to determine the correlation between reactive stroma and clinicopathologic characteristics in patients with PCa

Materials and Methods. We studied 50 tissue samples of patients with prostate cancer (PCa), who were treated at the National Cancer Institute (Kyiv, Ukraine) in 2015–2021. Morphological and immunohistochemical studies of the expression of α -SMA and Vim were performed according to standard protocols. Masson's trichrome staining was used for the identification collagen fibers. A morphometric study was performed using the ImageJ and CurveAlign 4.0 beta programs. Statistical analysis of the results was carried out using the methods of variation statistics using the program GraphPad Prism 8.

Results. Using the median value of Vim (Me = 9.5%) and α -SMA (Me = 18.6%) expression, the sample population was divided into high- and low-expression groups. We found that higher level of Vim and α -SMA expression in tumor tissue are associated with a high risk of progression PCa. Analysis of the morphometric study results showed that collagen fiber density was lower in tumor tissue with a high α -SMA and Vim expression. Moreover, high α -SMA and Vim expression in tumor stroma was associated with worse patient outcome.

Conclusions. Our study revealed that high expression of the reactive stroma markers was associated with poor prognosis in patients with PCa.

SOMATIC MUTATIONAL LANDSCAPE IN PATIENTS WITH PRIMARY MYELOFIBROSIS

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Objectives. Primary myelofibrosis (PMF) is the most aggressive subtype of the BCR-ABL-negative myeloproliferative neoplasms (MPN). Mutations in *JAK2*, *CALR* and *MPL* genes are defined as phenotype driver mutations and are included in WHO 2016 diagnostic criteria. Patients with PMF frequently have multiple additional oncogenic mutations. Routine molecular testing for MPN in Latvia is limited to *JAK2* and *CALR* testing and is only done at Rīga Stradiņš University Scientific Laboratory of Molecular Genetics (RSU SLMG). The aim of this study was to introduce and appraise new genetical testing method at RSU SLMG and to study the clonal status of patients with PMF.

Materials and Methods. 18 individuals (12 females and 6 males) with suggestive PMF diagnosis were selected from internal database. Custom next generation sequencing (NGS) panel was created allowing to detect genetic variations in 41 genes important for diagnosis, personalized treatment or risk stratification in PMF and related disorders. Sequencing was performed on iSeq (Illumina, USA). Identified variant interpretation was done following ClinGen, CGC and VISS guidelines.

Results. Median age of patients at sample acquisition was 61 (ranging 30–72) years. 14 patients had a common driver variant in *JAK2* and *CALR* and one patient had a driver mutation in other gene (*KRAS*) likely confirming PMF diagnosis in 15 of 18 patients. In three patients, no somatic mutations were detected. 11 of 15 patients had additional oncogenic mutations where most frequently mutated were DNA methylation regulators (*DNMT3A* – four cases) and histone methylation regulators (*ASXL1* and *EZH2*, 3 and 2 respectively).

Conclusions.

1. We successfully introduced new genetical testing method, for simultaneous somatic mutation analysis in multiple genes, for RSU SLMG, that could further be used in scientific research and as a routine diagnostic testing for patients with MPN.

2. We identified particularly large proportion of mutation-negative PMF samples, further clinical, laboratory and pathological reevaluation is needed.

SPECTRUM AND FREQUENCY OF CHEK2 VARIANTS IN BREAST CANCER IN LATVIA: INITIAL RESULTS AND LITERATURE REVIEW

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Objectives. While *BRCA1/2* gene mutational spectrum and clinical features are widely studied, there is limited data on breast cancer-predisposing non-*BRCA* pathogenic/likely pathogenic variants (PV/LPVs) in Latvia. According to previous studies, *CHEK2* is the most frequent moderate-risk breast cancer predisposition gene. The study aimed to analyse the frequency and mutational spectrum of *CHEK2* PV/LPVs in Latvia and perform a literature review on the subject data in neighbouring countries.

Materials and Methods. *CHEK2*, *BRCA1*, *BRCA2*, *PALB2* testing with next-generation sequencing (NGS) was carried out in 105 selected breast cancer cases.

Results. In breast cancer affected cohort from Latvia 6 *CHEK2* variants classified as PV/LPVs were observed (6/105; 5.7%), including recurrent ones c.470T > C (1.9%) and del5395(ex9–10del) (1.9%), as well as single ones – c.1100delC (1%) and c.444+1G > A (1%). For the literature review altogether, 49 PubMed articles were found, 23 of which were relevant, representing *CHEK2* PV/LPVs in the population of interest. Ten publications are from Poland, eight from Russia, three from Latvia and two from Belarus.

Conclusions. This study is the first report on complete *CHEK2* PV/LPVs screening in selected breast cancer affected cases in Latvia. The initial results are in line with other studies that *CHEK2* PV/LPVs frequency is around 5 to 6% of selected breast cancer cases. This is also the first report on c.1100delC and c.444+1G > A pathogenic variants from the Baltic States. High 8.6% population frequency of c.470T > C continues to question the variant's pathogenicity in particular populations. Other findings are concordant with previous reports from Latvia and neighbouring populations.

ULTRASOUND GUIDED NEEDLE BIOPSY TO EVALUATE NODAL METASTASIS AFTER PREOPERATIVE SYSTEMIC THERAPY IN DIFFERENT BREAST CANCER SUBTYPE GROUPS

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Objectives. Aim of the study is to evaluate the role of ultrasound guided fine needle aspiration cytology (FNAC) in the restaging of node positive breast cancer after preoperative systemic therapy (PST) in different breast cancer subtype groups.

Materials and Methods. From January 2016 – October 2020 158 node positive stage IIA–IIIC breast cancer cases undergoing PST were included in the study. After PST restaging of axilla was performed with ultrasound and FNAC of the marked and/or the most suspicious axillary node.

Study cases were divided into following breast cancer subtype groups– HER2+, Triple negative, Luminal A (Ki67 < 10%) and Luminal B (Ki67 > 10%)

Results. The overall false positive rate (FPR) and false negative rate (FNR) of FNAC after PST in whole cohort was 43 and 18%, respectively. Overall sensitivity – 55%, specificity – 93%, accuracy 70%.

In HER2+ group we include 37 cases (FNR 20%, FPR 0%). In Triple negative group include 19 cases (FNR 44%, FPR 0%), In Luminal A group we include 24 cases (FNR 14%, FPR 0%), Luminal B group 78 cases (FNR 43%, FPR 23%).

Conclusions.

1. FNAC after PST has low FPR and is useful to predict residual axillary disease and to streamline surgical decision making regarding ALND.

2. FNR is high in overall cohort and FNAC alone are not able to predict complete pathological remission after PST and omission of further axillary surgery.

3. However, FNAC in breast cancer HER2+ and Luminal A subgroup is more promising and further research with larger number of cases is necessary to confirm the results.

This study/research/work/publication has been developed with financing from the European Social Fund and Latvian state budget within the project no. 8.2.2.0/20/I/004 “Support for involving doctoral students in scientific research and studies” at Rīga Stradiņš University.

URINARY EXOSOMAL MIRNA PROFILES AS MARKERS OF BLADDER CANCER DEVELOPMENT

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Objectives. The aim of this study is to find and to develop noninvasive molecular marker of the bladder cancer (BC) using urinary exosomal miRNAs. To understand the bladder cancer-related exosomal miRNAs we compared BC patients' urinary exosomal miRNAs to healthy control.

Materials and Methods. The study analyzed urine samples from 11 BC (6 pTa or pT1 low-grade and 6 pT2 high-grade) and 7 healthy control patients, which were collected at Pauls Stradiņš Clinical University Hospital between 2018 and 2020. The urinary exosomal miRNAs in all groups were analyzed on the RT-PCR based QIAGEN human miRNA panels (752 miRNAs). Subsequently, target genes of urinary exosomal miRNAs from low (LG) and high grade (HG) BC patients and their network analysis were predicted using miRTarget, STING, CytoNCA, and Cytoscape.

Results. Among the 752 miRNAs analyzed, we found 96 and 78 differentially present urinary exosomal miRNAs altered with at least a 2.0-fold change in LG and HG group, respectively. 1425 genes were predicted as target genes of those miRNAs in LG group with 91 up-regulated miRNAs and 805 target genes with 71 up-regulated miRNAs in the HG group. Using these target genes, gene interaction networks with 20 key hub genes in each group were created. The interaction network predicted that TP53 is the strongest hub gene in both the LG and HG exosomal miRNA networks.

Conclusions. Identified exosomal miRNAs profiles cover many miRNAs which have been reported in bladder cancer tissues, plasma exosomes from BC patients, and BC patients urine. The miRNA profiles in this study are potentially used for the non-invasive molecular markers of BC.

YANG-MONTI TECHNIQUE AS PART OF TREATMENT FOR TESTICULAR CANCER PATIENT

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Objectives. 34 th years old patient admitted urologist because chronic flank pain from the left side, hydroureters and hydronephrosis stage II was found by ultrasonoscopy. Elevated creatinine level (159 mkmol/L) and reduced kidney filtration rate was detected (55 ml/min). During CT examination only 10 cm retroperitoneal lymph node from left side with compression of ureter was detected. 1.5 cm unpalpable tumor of left testis was found by scrotum ultrasound. After surgical treatment, patient underwent 4 courses of chemotherapy as seminoma (T2N3M0S0) stage IIC patient. Ureteral stent was placed to remove urine obstruction. Later patient underwent radiation therapy for lymph node, because the size of 4 cm after chemotherapy, lymph node dissection was not performed by high risk to damage kidney vessels. During 2 years follow-up ureteral stent was changed regularly each 4 months and no disease recurrence or progression was detected. Upper part of the ureter was damaged for 8 cm by MTS lymph node invasion and radiation therapy. To remove ureteral stent, witch cause symptoms, Yang-Monti ileal ureter reconstruction was performed. A 10 cm segment of distal ileum was isolated on it vessels, and divided into 4 equal parts. Segments was spatulated at the antimesenteric border and was sutured end to end by shortest length and tabularized over a stent. The proximal anastomosis of neoureter was sutured with pyelouretral junction level, but distal end anastomosed to bladder. No postoperative complications was detected. 4 month later stent was removed and no urine extravasation or obstruction was founded. Kidney scintigraphy show little left kidney excretion delay after 6 month, but generally function is safe. Patient fills good, no any discomforts are marked. This clinical case demonstrate that transverse tabularized bowel tube is an effective and efficient substitution of severe long segment ureter damage with sustained good long term results.

FACTORS THAT AFFECT METASTATIC LOCATION IN PATIENTS WITH BREAST CANCER

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Keywords. Breast cancer; Age; Metastasis

Objectives. Nowadays breast cancer is one of the most common invasive cancers in the world. There are many physiological changes in the human body as age grow older. This study was aimed to study the association between two metastatic locations of breast cancer and relationship between patients' age and metastatic locations of breast cancer.

Materials and Methods. This is a retrospective study conducted through analysis of the medical records of 70 patients, who were first time diagnosed with stage IV breast cancer from 2020 to 2021 at Pauls Stradiņš Clinical University Hospital. 32 patients of these patients were diagnosed with breast cancer in 2020, 38 patients in 2021. Valid patient data was collected and arranged with Microsoft Excel. Data analysis was done with IBM SPSS Statistics.

Results. In this study, metastatic locations of breast cancer included the lymph node, skin, lung, bone, liver, spleen, thoracic wall, abdominal cavity, subcutaneous tissues, pleura, adrenal gland, brain, mediastinum and paratracheal area. The range of patients' age was from 39 to 91 years old. The distribution of patients' age is not the same across categories of breast cancer metastasis in the liver (Independent-Samples Mann-Whitney U test, $P < 0.001$). Patients aged 50–59 had the highest number of liver metastases of any age group. There was a moderate statistically positive association between breast cancer metastasis between lymph node and pleura (Chi-Square test, $P = 0.007$; Phi coefficient = 0.376). There was a strong statistically positive association between breast cancer metastasis in skin and thoracic wall (Chi-Square test, $P = 0.002$; Phi coefficient = 0.697). There was a weak statistically negative association between breast cancer metastasis in lung and liver (Chi-Square test, $P = 0.027$; Phi coefficient = -0.268). There was a strong statistically positive association between breast cancer metastasis in abdominal cavity and pleura (Chi-Square test, $P = 0.014$; Phi coefficient = 0.470).

Conclusions. Patients' age is the risk factor that can affect metastasis of breast cancer to the liver. There were associations between metastatic locations of breast cancer.

EPIDEMIOLOGY OF TESTICULAR MALIGNANCY IN LATVIA FROM 1997 TO 2017

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Keywords. Testicular malignancy; Epidemiology; Survival; Young men

Objectives. Testicular malignancy accounts for 1.0–1.5% of all malignant tumors in men. Aim is to analyze data on the epidemiology of testicular malignancy in Latvia (1997 – 2017). Objectives include assessment of incidence, morphological and age groups, stages at the time of diagnosis, place of residence, overall and cancer specific survival.

Materials and Methods. Retrospective study that used SPKC (Latvian Centers for Disease Prevention and Control) medical records containing diagnosis code C62. This study did not use identifiable patient data. No direct contact was made with patients, no specific persons with a C62 diagnosis were identified, but morbidity parameters available at SPKC were analyzed in a generalized manner. The permission of the Data State Inspectorate was also received. Data processing and statistical analysis were performed using Microsoft Excel (2021) and SPSS version 20.0.

Results. Total number of patients is 785. Incidence is 4.43 per 100 000. Most common is stage I and age groups 25–34 and 35–44. There are 386 (49%) cases in stage I (131 in Riga, 60 in big cities, 195 in other residencies; 110 and 105 (56%) cases in age groups 25–34 and 35–44 respectively). 5 and 10 year overall survival is 0.71 and 0.65 respectively (95% CI 0.67–0.74 and 0.62–0.69), but cancer specific 0.76 and 0.74 respectively (95% CI 0.73–0.80 and 0.71–0.77).

Conclusions. Epidemiological data meets global trends. Younger age groups are more affected and diagnosis is most often established at stage I. Seminoma is most common morphological type in stage I and II, but nonseminoma in stage III. There are more cases in other residencies than in Riga and big cities. Survival is lower in age group above 64, in other residencies and in cases of nonseminoma.

MONTMORILLONITE-CYTOCHROME C COMPOSITE NANOPARTICLES WITH SELECTIVE ANTICANCER EFFECT FOR TREATMENT OF NEOPLASMS WITH SUPERFICIAL LOCATION

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Keywords. Cytochrome C; Nanoparticles; Cancer, Apoptosis; Cytotoxicity

Objectives. To study the cytotoxicity of cytC-MM nanoparticles and their physicochemical properties as a function of cytC concentration in the suspension. Cytochrome C (cytC) is mitochondrial haemoprotein, which has a key role in the intrinsic pathway of apoptosis. This genetically programmed cell death is intracellular cascade of irreversible biochemical reactions, which causes minimal damage to surrounding tissues (unlike necrosis). However, in tumor cells, apoptosis is blocked due to the inability of their mitochondria to release cytC. Therefore, the apoptosis can be initiated by the introduction of exogenous cytC, using the capability of cancer cells to phagocytize extracellular colloid particles with submicron size in contrast to normal cells (apart from these of immune system). We use the mineral montmorillonite (MM) which is permitted in the human medicine and is suitable as drug carrier because of its large adsorption capacity determined by the half-micrometer size and 1-nanometer thickness of its monolayers.

Materials and Methods. We used microelectrophoresis, static and electric light scattering to determine the electrophoretic mobility, mass increment of MM monolayers at cytC adsorption, adsorbed/free ratio, number of adsorbed cytC globules per one MM monolayer, concentration of cytC-MM composite particles. In addition, the cytotoxic effect of cytC-MM was tested on colon cancer cell culture.

Results. CytC solution and MM suspension had no effect on the cancer cells, whereas the composite cytC-MM nanoparticles killed 97% of the cells after 96 h treatment. An interesting finding was that the cytotoxicity depends nonlinearly on the concentration of cytC in the cytC-MM suspension, but linearly on the logarithm of this concentration.

Conclusions. The in vitro experiments demonstrate that cytC-MM composite nanoparticles have potential application in anticancer treatment of superficial neoplasms of the skin and the gastrointestinal system (oral cavity, esophagus, stomach and colon).

CORRELATION OF COLORECTAL CANCER RISK FACTORS WITH THE RISK OF POSTOPERATIVE WOUND INFECTION

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Keywords. Colorectal cancer; Oncology; Gastroenterology

Objectives. Colorectal cancer is one of the most common types of cancer in Latvia and one of the main causes of death in the world. The main purpose of work is evaluate the correlation of colorectal cancer risk factors with the risk of postoperative wound infection.

Materials and Methods. The total number of respondents is 168 patients. Data analysis includes information on colorectal cancer patients who underwent elective surgical treatment and complication counts, as well as information on patient modifiable and non-modifiable risk factors. Using the obtained data, the correlation between colorectal cancer risk factors and the risk of developing a wound infection after surgery was evaluated using the chi-square test.

Results. Postoperative wound infection was found in 15.4% (N = 26) of all patients. Summarizing the obtained results, it can be concluded that such risk factors as active and passive smoking, alcohol consumption, physically inactive lifestyle, increased body mass index, obesity, cholecystectomy, colon polyps, male sex, age > 65 years and oncological diseases in 1st degree relatives does not increase the risk of wound infection after surgery ($p > 0.10$). On the other hand patients with diabetes have a higher risk of developing wound infection after surgery ($p = 0.05$). Significance level 0.05.

Conclusions. Based on the obtained data, it can be concluded that there are no statistically significant correlations between most of the colorectal cancer risk factors and the risk of wound infection after surgery, with the exception of diabetes. Despite the fact that a statistically significant relationship was found, it should be noted that due to the lack of data no conclusions can be drawn about the true relationship. It is necessary to involve a larger number of patients to clarify the results.

SEASONALITY OF THE HOSPITALIZATIONS IN MELANOMA PATIENTS

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Keywords. Melanoma; Seasonality of Hospitalizations

Objectives. This study aims to determine the seasonality of hospitalizations in melanoma patients. A lot of research suggests that the incidence of cutaneous melanoma has been reported to be at peak in summer and low in winter. Seasonality of melanoma is well described, and it is influenced by a number of variables, such as sun exposure, individual and health service factors.

Materials and Methods. The retrospective study was conducted at the Latvian Oncology Center. 134 patients with histologically confirmed melanoma in the 2015, were involved in the study. Patient data: age, sex, stage, histological parameters, disease progression, date and duration of hospitalization were collected. The seasonality of hospitalization was shown as Barplot diagram in R-studio program. We calculate Pearson's chi-squared test to find out the difference between actual data and the theoretical/uniform distribution.

Results. A barplot hospitalization diagram shows hospitalization by month. Minimal hospitalizations were observed in May (N = 5) and June (N = 6), and peaks were observed in April (N = 14) and October (N = 15), which contradicts previous observations. The significance given by Chi-Squared test is $P = 0.09$, which is not enough to reject the uniform distribution by month.

Conclusions. In order to reject the uniform distribution of hospitalizations by month and to note some other differences, larger data sets over multiple years would be needed. We suppose that our findings can be explained with the fact that dermatologists recommend checking birthmarks mainly in spring and autumn, as active tanning process can interfere with the dermatoscopy. Some other reasons may include summer vacations for both doctors and patients and irregular overload of hospital units. It is also a well-known fact that the time between the diagnostic biopsy and primary surgical excision can be significantly extended.

MACHINE LEARNING-BASED PREDICTION OF GENES INVOLVED IN THE PROGRESSION OF BREAST CANCER

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Keywords. Breast cancer; Random Forest; KMeans Clustering; Machine Learning; Cancer progression

Objectives. Even though the cancer treatment approaches have developed tremendously over time, breast cancer (BC) remains the second leading cause of death among women worldwide and the first in Ukraine. Data analysis and machine learning algorithms can predict noteworthy patterns and make meaningful conclusions that are not visible to the human eye. Thus, we want to build a machine-learning model and investigate prognostic genes that decrease BC's overall state and potential survival.

Materials and Methods. Clinical and genes expression data was taken from cBioPortal data base. K-Means method was used for dividing patients into proper classes based on their survival. Other clinical markers (tumor size, lesion of the lymph nodes and metastasis) were chosen according to the TNM cancer staging system. Classification was done by Random forest algorithm. All analyses were done in Python using external libraries (numpy, pandas, sklearn, etc.)

Results. The obtained database consisted of molecular and clinical data (including expression scores of 19737 genes) in 1082 patients. The Random-Forest-based computational model signified a pool of 200 genes being able to act as cancer prognostic factors. Among others, they enter into Wnt, VEGF, PI3K/Akt and many other cancer-related pathways, thereby facilitating cell proliferation and growth, tumouri- and angiogenesis, cancerous tissue extension etc. Some of the chosen genes are already studied regarding their prognostic effects, while others were not yet discussed in such context.

Conclusions. By and long, BC development is a complicated process that involves dozens of internal and external factors. Even at its initial version, the developed model is a great tool to extract the most prominent cancer biomarkers and, therefore, bring new comprehensive insights into cancer diagnostics and treatment strategies. Currently, we are working on improving the model's efficacy and involving additional dry and wet methods to test our findings.

KNOCKOUT OF LNCRNA-CCAT1 WITH THE USE OF CRISPR-CA9 SYSTEM AND G7PAMAM DENDRIMERS INFLUENCES APOPTOSIS AND PROLIFERATIONS OF NSCLC CELLS

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Keywords. NSCLC cells; Apoptosis; Proliferation

Objectives. Colon cancer-associated transcript 1 (CCAT-1) is an oncogenic lncRNA that has been emerged as a vital biomarker for diagnosis, prognosis and therapeutic interventions in multiple malignancies. The previous studies showed that lncRNA-CCAT1 was upregulated in NSCLC cells and its expression was related to tumor growth and reduced survival rate. The aim of our study was to evaluate influence of the knockout of lncRNA-CCAT1 with the use of CRISPR-Cas9 system and G7 PAMAM dendrimers on apoptosis and proliferations of NSCLC cells.

Materials and Methods. We used two human lung adenocarcinoma cell lines: A549, H1975 and H1703 squamous cell carcinoma cell line. The knockout of the lncCCAT expression was performed using the CRISPR-Cas9 system and G7 PAMAM dendrimers. We used 4 combinations of gRNAs. The apoptosis of NSCLC after lncRNA-CCAT1 knockout was estimated with the use of flow cytometry and Annexin V staining, evaluation of caspase-3/7 and measurement of mitochondrial membrane potential changes. Expression of Ki67 was measured by flow cytometry to evaluate NSCLC cells proliferation. All mentioned above parameters were evaluated 24, 48 and 72 hours after transfection. Nonparametric ANOVA tests was used for statistical analysis.

Results. We found that transfection with conjugates of G7 PAMAM dendrimers and px459 v2.0, the appropriate gRNAs (for lncCDH5-3:3 knockout), and pcDNA3.1 plasmid are downregulating expression of lncRNA-CCAT1. We confirmed that apoptosis of NSCLC was increased after transfection and cells proliferation was reduced. We also found differences in timing and intensity of biological effects when different combination of gRNAs are used in particular NSCLC cell lines.

Conclusions. The conjugates of G7 PAMAM dendrimers and px459 v2.0, the appropriate gRNAs (for lncCDH5-3:3 knockout), and pcDNA3.1 plasmid can be used for knockout of the expression of lncRNA-CCAT1. On the other hand the gRNAs shall be individually chosen for particular NSCLC cells according to their genetic mutation status.

ASSOCIATION OF CIRCULATING IL-6 LEVELS WITH EXPRESSION OF BONE TISSUE REMODELING MARKERS IN TUMOR TISSUE OF PROSTATE CANCER

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Keywords. Prostate cancer; Interleukins; Osteopontin; Osteonectin

Objectives. The system of interleukins (IL), as well as other cytokines, plays an important role in many physiological and pathological processes, including malignant neoplasms. IL-6 is the main inducer of inflammation and angiogenesis. The level of this cytokine affects osteoblastogenesis, thus, affects the expression of bone tissue remodeling proteins, such as OPN and ON. It has been shown that an increase in the expression of IL-6 in tumor cells is associated with an increase in the invasive properties of prostate cancer. In addition, according to the data of individual observations, an increase in levels of IL-6 in the blood of patients indicates the aggressiveness of PCa. Nevertheless, the association of circulating IL-6 levels and tumor OPN and ON expression is not studied.

Materials and Methods. For the quantitative measurement of IL-6 in the blood serum of patients with PCa the method of enzyme immunoassay (ELISA) was used. The expression of OPN and ON in the tissue of prostate cancer was evaluated using the immunohistochemical method.

Results. We studied the correlation between levels of bone tissue remodeling markers in tumors and IL-6 levels in the blood serum of patients with PCa. Patients with OPN expression above 100 H-Score points had serum IL-6 levels 2.86 times higher and amounted to 211.5 ± 27.3 pg/mL, compared to patients with low osteopontin expression. At the same time, IL-6 levels were 1.93 times higher in patients with high expression of osteonectin and amounted to 187.5 ± 19.1 pg/mL.

Conclusions. Thus, we have shown the correlation between the levels of circulating IL-6 and OPN and ON indicators in the tumor tissue of patients with PCa. A direct correlation of IL-6 expression with osteopontin and osteonectin indicators in patients with breast cancer and prostate cancer was revealed.

HEREDITARY OVARIAN CANCER-APPROACH TO THERAPY AND PREVENTION

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Keywords. Ovarian cancer; Hereditary; BRCA1

Introduction. Genetic testing is an essential aspect of oncology, integrated into clinical practice over the years. The developed target therapy allows the clinician to provide different types of medication for diverse patients and facilitates a multidisciplinary approach in the management of individuals at increased risk for hereditary cancer.

Case Description. A 53-year-old female (mother) was diagnosed with ovarian cancer stage IIIB (2010), operated and received seven lines of chemotherapy due to recurrences. According to available medications and guidelines at the time. In 2015 germline mutation in the BRCA1 gene was found, and therapy with olaparib was initiated in 2016 but stopped after three months due to severe complications. In 2017 the patient died. After discovering a germline BRCA1 mutation a 36-year-old female (daughter, living in the UK) underwent genetic testing, which revealed that she was also a carrier. Even before the testing, she had regular MRIs, CT scans, and gynaecologist visits from 2011 to monitor possible changes and actively inquired about risk reduction surgeries. Despite knowing she was a risk group patient, none of the possible preventative measures were offered. In 2022 a 43-year-old woman was diagnosed with high-grade serous carcinoma in the left fallopian tube. CT showed pulmonary metastasis – stage IV; she underwent an operation and is receiving chemotherapy.

Summary. Presenting two cases of inherited BRCA1 gene mutation and the development of ovarian cancer. Both underline the importance of early genetical testing, and the second case shows the lack of risk-reducing measures in the specific patient group.

Conclusions. Early genetic mutation assessment is crucial for managing patients and their families. Genetic counselling, discussions of risk-reducing procedures, and attention to quality-of-life and psychological issues should all be included in patient care.

MULTIFOCAL UPPER TRACT UROTHELIAL CARCINOMA AND BLADDER TUMOR COMPLICATED MANAGEMENT AFTER DISEASE PROGRESSION

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Keywords. Multifocal papillary urothelial carcinoma; Complicated urinary tract infection; Orchiepididymitis; Liver abscess; Hypercalcaemia

Introduction. Urothelial carcinomas are distinguished by their ability to develop multiple foci in a synchronous or sequential fashion throughout the urinary tract. Upper tract urothelial carcinoma and bladder tumour often co-exist. After radical nephroureterectomy during the first 2 years 22 – 47% of patients experience intravesical recurrence.

Case Description. A 60-year-old male was diagnosed with multifocal upper urothelial tract carcinoma (pyelo-ureteral region) and bladder: high grade papillary urothelial carcinoma T₃N₀M₀G₃, October 2021. Right side nephroureterectomy, paracaval, parailiac lymph node and right urethral ostium dissection was performed. Medical history included smoking, type 2 diabetes, and coronary artery disease. Eight months later he experienced urinal retention and nycturia. Computed tomography (CT) scan showed disease progression – lung, liver, peritoneal, retroperitoneal metastasis, multifocal loci in bladder (cytology revealed urothelial carcinoma cells in urine). Overall condition deteriorated rapidly – cognitive difficulties due to hypercalcaemia (Grade 2, treated with zoledronic acid) and onset of a complicated urinary tract infection (treated with antibiotics). When patient improved, he received chemotherapy with gemcitabine. Two weeks later patient was hospitalised with severe dehydration, polyuria and left sided orchialgia. Ultrasonography showed orchiepididymitis and abscess. Orchiectomy was performed, he received antibiotics and zoledronic acid (recurrent hypercalcaemia). Two weeks later he received first dose of second course of gemcitabine, during the next week he developed 40°C fever. He was hospitalised, ultrasonography showed large liver metastasis and abscess. Treatment included abscess drainage and antibiotics. Two weeks later, due to recurring complaints, the same treatment was repeated. CT scan showed rapid disease progression. Further treatment included best supportive care. Patient died in November 2022.

Summary. Case report highlights a rare urothelial malignancy with rapid progression, infectious complications and hypercalcaemia.

Conclusions. Treatment of metastatic disease had major obstacles imposed by rapid progression and other patient's acute conditions.

POPLITEAL MASS IN AN ADOLESCENT GIRL

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Keywords. Baker's Cyst; Poplitea; Tenosynovial Giant Cell Tumor; Children

Introduction. An abnormal mass in the popliteal fossa can be caused by multiple pathologies, eg., a benign synovial cyst (Baker's cyst), tenosynovial giant cell tumor (TGCT), or an extremely rare pigmented villonodular synovitis (PVNS). The goal of this case report is to present an observed popliteal mass and overview its impact on the patient's health.

Case Description. We report a 16-year-old girl presenting with right knee swelling, pain, limited joint movement. It started seven months ago, and worsened after visiting a sauna. The examination revealed swelling of the knee joint and a hard palpable structure in the poplitea, red vertical skin striae were visible around the mass. An ultrasound of the joints showed severe effusion in the suprapatellar bursa, synovial hypertrophy, a massive Baker's Cyst in the poplitea with multiple visible septa. MRI examination identified an increased fluid in the knee joint, significantly thickened synovium and Baker's cyst measuring approximately 10x5.8x3.2 cm. The patient underwent arthroscopy of the right knee. A cytological examination of synovial fluid showed groups of synovial cells, average amount of leukocytes, lymphocytes (70%), neutrophils (30%), macrophages. Histologically – a tumor was found, formed by monomorphic cells with oval nuclei, eosinophilic cytoplasm, osteoclast-type multinucleated giant cells, hemosiderophages, in line with the diagnosis of tenosynovial giant cell tumor.

Summary. A female patient, diagnosed with a rare and benign TGCT, involving the synovium, bursae and tendon sheath. TGCT leads to joint pain, swelling and limitation of movement. The tumor was removed during an arthroscopy.

Conclusions. We detected a non-malignant TGCT involving the joint synovium, bursae and tendon sheaths. Our patient underwent surgery – the most effective treatment for giant cell tumors.

KERATOACANTHOMA WITH A GIGANTIC CUTANEOUS HORN

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Keywords. Keratoacanthoma; Cutaneous Horn; Rare Disease

Introduction. Keratoacanthoma (KA) is a well-differentiated benign tumour of the skin affecting between 100 and 150 out of every 100 000 people worldwide. A rare complication of KA is the cutaneous horn (CH) and squamous cell carcinoma (SCC). Key predisposing factors for KA, CH and SCC are UV radiation, fair skin phenotype and older age.

Case Description. A 91-year-old female patient presented to the Department of Plastic and Reconstructive Surgery of Republican Vilnius university (DPRS) hospital with a skin tumour – a horn on the right hand, which first time occurred 3 years ago. The patient's case history shows that she is from a nursing home and the CH had been removed 3 times. The patient underwent the last surgery 1 year ago, but the CH recurred. On examination, the patient was observed to have a CH 10 cm length on the dorsal surface of the right hand. Under regional anaesthesia, surgery for tumour removal with full-thickness skin grafting was performed. Postoperatively, the patient was treated with anticoagulants and analgesics. The final pathological conclusion was horn formed by keratinous masses with hyperkeratosis and an infiltratively growing SCC. The patient was brought for postoperative follow-up, the skin was healed and only a slight scar was observed.

Summary. A 91-year-old female patient had had her CH removed 3 times due to KA. This time, not only was the CH found to be extremely large, but also the SCC. The CH was surgically removed. CH and SCC were not only due to a genetic predisposition but also due to a lack of care.

Conclusions. If left untreated, KA can be complicated by CH and SCC, which can spread to other parts of your body, causing serious complications. Such patients are likely to have a genetic predisposition and require constant care and monitoring.

CAN LIFE-SAVING TREATMENT FOR A YOUNG WOMAN BE LIFE-THREATENING? CHEMOTHERAPY-INDUCED CARDIOMYOPATHY

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Keywords. Anthracyclines; Trastuzumab; Cardiomyopathy; Heart failure

Introduction. Worldwide, breast cancer (BC) is the most common cancer in women. The survival rates increasingly rise, but the patients experience numerous adverse events as induced by anticancer treatment. Cardiovascular disease (CVD) is now the main cause of death in the group of BC survivors. Among chemotherapeutics, anthracyclines and trastuzumab are the most associated with cardiotoxicity – type I and type II respectively. The risk of myocardial damage significantly increases with trastuzumab and anthracycline's combination.

Case Description. 8-year-old female presented at the Cardiology Department with rest dyspnea. She was treated with chemotherapy scheme including doxorubicin, cyclophosphamide, paclitaxel and trastuzumab (total doxorubicin dose = 240 mg/m²) 4 months ago, due to BC. Control echocardiography performed prior to chemotherapy did not reveal any abnormalities. On admission the echocardiography revealed hypokinesis with left ventricular ejection fraction (LVEF) 15%, BNP was 757 pg/mL. The diagnose of the subacute type of anthracyclin cardiotoxicity with subsequent heart failure (HF) NYHA IV was established. Response was obtained after levosimendan treatment, patient additionally received Tritace, Vivacor, Diuver and Bixebra with the daily dosages of 5, 12.5; 5 and 10 mg respectively. A follow-up echocardiography revealed LVEF 35% and patient was discharged in general good condition. Patient was then twice readmitted to the hospital with HF exacerbation and improvement was observed after combined treatment with Levosimendan and Dobutamine. Patient underwent implantation of the Left Ventricular Assist Device (LVAD) and simultaneous left atrial appendage closure surgery complicated by cardiac tamponade. After 3 years follow-up, the patient remains in general good condition and is qualified for LVAD deactivation.

Summary. The treatment including both anthracyclines and trastuzumab increases the risk of cardiac adverse events incidence.

Conclusions. The crucial role of cardiological monitoring during and after oncological treatment with subsequent appropriate prophylaxis implement should be emphasized due to preventing life-threatening complications.

PRIMARY HEPATIC LEIOMYOMA: UNUSUAL CAUSE OF INTRAHEPATIC DUCTS OBSTRUCTION

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Keywords. Hepatic leiomyoma; Laparoscopic segmentectomy; Isolated bile duct dilatation

Introduction. Primary hepatic leiomyoma (PHL) is a very rare pathology, arising within the smooth muscle cells from the lining of either the blood vessels or biliary tree within the liver parenchyma. It more commonly occurs in immunosuppressed patients, while only a few cases among immunocompetent individuals have been described in medical literature.

Case Description. 51-year-old female was admitted to Hepato-Pancreatico-Biliary Surgery Department because of abdominal pain, jaundice and suspected bile duct obstruction. It was known that patient underwent a cholecystectomy a month ago. Further examination and endoscopic retrograde cholangiopancreatography (ERCP) was performed – no bile duct stones were found. Two weeks later, abdominal pain recurred, isolated dilatation of the liver S2 intrahepatic ducts was detected, leading to suspicion of cholangiocarcinoma. Three additional MRI and MRCP, performed during next 6 months, revealed persistent dilatation of intrahepatic bile ducts and progressively growing mass (1.3×1.1 cm) in S2. PET/CT imaging indicated minimal metabolic activity in S2. Finally, laparoscopic liver segmentectomy II was performed. Surprisingly, postoperative histopathological examination of resected specimen denied cholangiocarcinoma and a rare diagnosis of PHL was confirmed. At more than a year follow up, the patient is in good condition with no evidence of tumor recurrence.

Summary. In this clinical case we presented a rare case of primary hepatic leiomyoma mimicking cholangiocarcinoma. According to findings of multiple radiological examinations, it was believed that progressively growing mass in the liver was malignant and only a histopathological analysis of resected specimen revealed actual diagnosis. Patient had no history of immunosuppression.

Conclusions. Primary hepatic leiomyoma is a rare tumor with a difficult radiological diagnosis. Due to the non-specific radiological findings and uncertain biological behavior, it usually leads to surgical resection. Although rare, the possibility of PHL should be borne in mind.

DIFFUSE LARGE B-CELL LYMPHOMA OF THE ENTIRE COLON

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Keywords. Diffuse large B-cell lymphoma; Multiple myeloma; Colonoscopy

Introduction. Through colorectal malignancies, primary colonic lymphoma accounts for 0.5% of cases. In that location, most frequently occurring subtype is Non-Hodgkin's lymphoma (NHL) to which diffuse large B-cell lymphoma (DLBCL) belongs. The lesions caused by DLBCL are typically found as single tumors of distinct parts of the colon. DLBCL and multiple myeloma (MM) originate from B-cell line, however co-occurring of these two disorders is a rarity. In the group of patients with MM, genetic predisposition and exposure to environmental co-risk factors may provide higher risk of a secondary hematologic malignancies.

Case Description. 72-years-old female suffering from alteration of bowel habits, weight loss and unilateral leg ache, was presented at the Department of Gastroenterology. Laboratory tests performed on admission, were remarkable for anaemia. During colonoscopy, non-specific polypoid lesions were observed throughout entire colon and the biopsy was performed. Pathomorphological examination showed infiltration of large and medium-sized lymphoid cells with Ki67 value estimated at 60%, with CD20, BCL2 and BCL6 expression as well as partial expression of cyclin D1. Diffuse large B-cell lymphoma activated B-cell type (ABC-DLBCL) was revealed. Nevertheless, CT and PET-CT showed lesions typical for MM. Woman was transferred to the Department of Haematology where diagnosis of ABC-DLBCL comorbid with MM was confirmed. After 6 months of pharmacologic treatment, patient underwent a colonoscopy. Regression of the lesions in colon accompanied by clinical improvement was observed.

Summary. The study describes a case of female with DLBCL lesions in the entire colon. Detailed histopathological and imaging examinations revealed co-occurrence of ABC-DLBCL and MM. After 6 months of haematological treatment, remission of lesions in colon was achieved.

Conclusions. Lesions occurring in the colon could be manifestation of a haematological malignancy. Therefore, a laboratory, endoscopic and immunohistochemical diagnostic should be performed in patients who report alarming signs related to the lower gastrointestinal tract.

A RARE CASE OF ADVANCED ALVEOLAR SOFT-PART SARCOMA OF THE RIGHT GLUTEAL REGION IN A PREGNANT 23 YEAR-OLD FEMALE

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Keywords. Alveolar soft-part sarcoma; Pregnancy

Introduction. Alveolar soft-part sarcoma (ASPS) is an extremely rare sarcoma subtype. ASPS affects adolescents and young adults, more commonly women. The tumor presents as slow-growing, painless soft tissue mass that originates primarily from muscles of the lower extremities. Patients with locally advanced, unresectable, or metastatic ASPS have poor prognosis.

Case Description. A 23-year-old pregnant female presented with lower back and right hip joint pain, and edema in the right gluteal region. Symptoms had progressively worsened during the past 4 months. MRI showed a mass spreading along the *m.ileopsoas dextra*, localized in the small pelvis, destroying the iliac bone and compromising L4-L5, L5-S1 neural foramina. A biopsy was performed, confirming the diagnosis of ASPS, cT4N0M0, stage IIIB. At the time of diagnosis fetal USG showed progressing pregnancy at 26 weeks of gestation. The spread of the tumor was determined locally advanced and unresectable. Chemotherapy during pregnancy was indicated. After the course of induction therapy of doxorubicin and ifosfamide, progression of the tumor was observed. OncoDNA test revealed targeted therapy not compatible with pregnancy, therefore fetal maturation was initiated followed by C-section at 30⁺⁰ weeks of gestation. Neonate was born with complications due to prematurity. Targeted therapy was initiated with PD1-inhibitor pembrolizumab. Despite several lines of palliative therapy, the tumor continued to aggressively spread, causing debilitating symptoms and metastasis in lungs. Patient died 14 months after initial diagnosis.

Summary. 23-year-old pregnant female presented with edema in the right gluteal region and was diagnosed with ASPS. Patient received chemotherapy during pregnancy and gave birth to a premature baby. Despite multiple lines of cancer therapy, patient died within 14 months.

Conclusions. This clinical case shows that starting palliative chemotherapy during pregnancy not only prolonged patients survival, but also was proven to be safe for the fetus and allowed it to reach a higher gestational age.

A RARE CASE OF EMBRYONAL RHABDOMYOSARCOMA IN THE HAND IN A YOUNG ADULT

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Keywords. Embryonal; Rhabdomyosarcoma; Young adult; Hand

Introduction. Rhabdomyosarcoma is a type of a cancer who forms of rhabdomyoblasts, and it is much more common in children. Approximately 350 new cases of rhabdomyosarcoma are diagnosed in the United States each year, and the annual incidence under the age of 20 is 4.3 cases per one million. There are four types of rhabdomyosarcoma: embryonal, alveolar, pleomorphic, and spindle/sclerosing. Embryonal rhabdomyosarcoma usually presents in the head, neck, and genitourinary sites. Rhabdomyosarcoma of the extremities tend to have a worse prognosis compared to other sites.

Case Description. In June 2021, an 18-year-old woman found a growing mass on the dorsal surface of her right hand, between the I and II metacarpal bones, which gradually increased in size. US, MRI and a biopsy of the hand were performed, where an embryonal rhabdomyosarcoma was detected. A CT scan of the chest was performed, where metastases were found in the right axillary lymph nodes, a lymph node near the aortic arch and two metastases in the subcutaneous tissue. Chemotherapy according to the IVA-CEV-IVE-IVA-CEV-IVE-IVA-CEV-IVE scheme, radiation therapy and primary tumor resection was performed. Positive dynamics were observed in control examinations. Maintenance therapy with TRO+IDA alternating with TRO+ETO was started, during which cancer progression was detected in the lymph nodes, mammary glands, subcutaneous tissue, and pancreas. 2nd line palliative chemotherapy was started. On August 25, 2022, the patient was hospitalized with febrile neutropenia, pancytopenia and sepsis. The patient died on August 26.

Summary. The patient's tumor developed in young adulthood, in an atypical location and metastasized to unusual locations such as subcutaneous tissue, mammary glands, pancreas.

Conclusions. Embryonal rhabdomyosarcoma is a rare tumor that chemotherapy and radiotherapy are still based on the 2009 guidelines and surgical therapy on the 2018 guidelines. Overall survival of metastatic rhabdomyosarcoma patients is low and typically does not exceed 25%.

RARE PLEURAL TUMOR MISTAKEN FOR POST-COVID-19 SYNDROME

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Keywords. Solitary fibrous tumor; COVID-19; Thorax surgery; Mediastinal pleura

Introduction. Solitary fibrous tumors of the pleura (SFTPs) represent only 5% of pleural tumors. SFTPs can occur at any age; however, they typically present in the sixth and seventh decades of life with equal representation in both sexes. Here we present a patient with a giant malignant solitary fibrous tumor of the pleura successfully treated surgically, whose diagnosis was delayed due to symptoms similar to long COVID.

Case Description. A 60-year-old female was referred to the Department of Thoracic Surgery to treat a large tumor filling the right half of the chest cavity. The patient presented with dyspnea requiring oxygen therapy, chest pain, peripheral edema, and nail clubbing. Moreover, since COVID-19, she has been experiencing progressing weakness, shortness of breath, and sporadic productive cough for over a year classified as a post-COVID syndrome. Computed tomography (CT) of the chest showed a mass in the right hemithorax with complete lung atelectasis and mediastinal shift to the left. A 7 kg tumor with 32.0x24.0x11.5 cm dimensions was resected via a right antero-latero-posterior thoracotomy. The final histopathological examination reported the malignant form of a solitary fibrous tumor of the pleura. During the hospitalization, we observed significant clinical improvement, and the patient remains disease-free to this day.

Summary. SFTPs are usually asymptomatic in the early stage. However, large tumors can cause symptoms like cough, chest pain, chest tightness, and dyspnea due to the compression of surrounding tissues. Surgical resection remains a treatment of choice since there is insufficient evidence of chemo- or radiotherapy effectiveness.

Conclusions. The COVID-19 pandemic caused limited access to health care for patients, in many cases delaying diagnosis and treatment. Fortunately, it caused a spike in the number of radiological examinations of the chest, giving us a unique opportunity to treat many incidental findings at an early stage.

THREE SIMULTANEOUS PRIMARY TUMOURS OVER TWO YEARS IN A SINGLE PATIENT

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Keywords. Pulmonary pleomorphic carcinoma; Palliative immunotherapy; High-grade urothelial carcinoma; High-grade prostate carcinoma

Introduction. Multiple primary malignancies are present when a patient is diagnosed with more than one primary malignancy and when each tumour is histologically unrelated to the others. Here, we report about three primary tumours over two years in a single patient.

Case Description. A 69-year-old man was diagnosed with pulmonary pleomorphic carcinoma (PPC) corresponding to clinical stage IIB (pT2aN1M0) and high-grade prostate carcinoma (cT3aN0M0, Gleason 5+4 = 9) in 2020. He underwent lobectomy and lymphadenectomy surgery the same year. The adjuvant chemotherapy (carboplatin, vinorelbine) was prescribed for PPC and hormone therapy (triptorelin) for treating prostate carcinoma. His image findings showed bilateral adrenal metastasis, the right and the left adrenalectomy were performed in 2021. Multidisciplinary consilium prescribed palliative immunotherapy with Pembrolizumab every 3 weeks. Control CT showed multiple bone metastases, and the patient was diagnosed with high grade urinary bladder carcinoma in 2022. According to clinical presentation transurethral resection of the bladder tumour and epicystostomy were made. After 4 cycles of gemcitabine, his bone metastases were not active. Patient was undergoing radiotherapy for prostate and bladder cancer, keeps taking pembrolizumab and zoledronate.

Conclusions. The incidence of multiple primary malignancies is increasing in daily practice. In this case we should have high clinical suspicion for the possibility of recurrent malignancy. There might be crucial differences in treatment options.

BASAL CELL CARCINOMA

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Keywords. Basal cell carcinoma; BCC; Skin cancer; Non-melanoma

Introduction. Basal cell cancer (BCC) is a type of skin cancer that forms in the basal cell layer, accounting for nearly 80% of all skin cancers and mostly occurs in men and individuals over the age of 50. Most common risk factors are ultraviolet radiation (UVR), light-coloured skin, eyes and hair, immunodeficiency, personal and family history of skin cancer. We present this clinical case of BCC due to its atypical clinical presentation.

Case Description. A 33-year-old woman presented with complaints of an itchy 0.8 cm light red patch on her left upper back. The patient noted that the patch has been growing gradually for the past six months. After visually inspecting the affected area, a digital dermoscopy was performed to inspect the skin lesion which was similar to nonspecific dermatitis: brownish, salmon-coloured, scaly patch with regular borders. Additionally, the patient has ulcerative colitis (UC), which is being treated with Mesalazine 2g/d. Based on the medical examination and patient's anamnesis, a clinical diagnosis of dermatitis was made and treatment was initiated. After several months of ineffective treatment, a 3.5 mm tissue biopsy was performed in local anaesthesia for histological clarification. Histopathological analysis demonstrated a Superficial Multifocal BCC and the patient underwent surgical tumor resection.

Summary. BCC is uncommon in young adults – only 1.86% of all cases are people under 35 y/o. In our case, due to the atypical clinical presentation and lack of risk factors, the diagnosis of BCC wasn't considered at first glance. Nevertheless, ulcerative colitis might be an important factor and shouldn't be overlooked, since people with UC are more likely to have BCC.

Conclusions. The importance of differentiation and clear medical history are crucial in making the right diagnosis. If the damaged skin area expands and the origin is not clear, histological clarification is necessary.

HISTOLOGIC TRANSFORMATION OF MANTLE ZONE LYMPHOMA TO DIFFUSE LARGE B-CELL LYMPHOMA: A CASE REPORT OF DISEASE RELAPSE AFTER COVID-19 INFECTION

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Keywords. Mantle cell; Diffuse large B-cell lymphoma; COVID-19; Chemotherapy

Introduction. Mantle cell lymphoma is a rare subtype of non-Hodgkin's lymphoma, which may develop into subtypes, like diffuse large B-cell lymphoma, which is the most common among non-Hodgkin's lymphomas. Clinical features of diffuse large B-cell lymphoma include quickly growing, non-painful mass, enlarged neck, groin and/or abdomen lymph nodes, fever, night sweats, weight loss. Current data of COVID-19 infection risk, outcome in patients with non-Hodgkin's lymphoma, receiving chemotherapy, immunosuppression treatment, is variable and insufficient. We report a case of histologically confirmed transformation of mantle zone lymphoma to diffuse large B-cell lymphoma, disease relapse after COVID-19 infection.

Case Description. We present a 58-year-old female patient with history of abdominal pain episodes associated with fever, diarrhoea, nausea in 2017. Biopsy of colon revealed mantle cell lymphoma. Patient received polychemotherapy courses with Rituximab, Cyclophosphamide, Vincristine, high dose Cytarabine, Cisplatin. In 2020 disease relapsed. Therapy with Rituximab, Bendamustine was continued. In 2021 disease relapsed, lymphoma's transformation to diffuse large B-cell lymphoma was histologically confirmed. After high dose chemotherapy (Rituximab, Cytarabine, Cisplatin), autologous stem cell transplantation was performed. Positron emission tomography post-transplantation showed complete metabolic remission. The Moderna mRNA vaccine against COVID-19 was received twice. 9 months prior to case presentation diffuse large B-cell lymphoma relapsed after complicated COVID-19 infection, which was diagnosed in February 2022. Patient received Remdesivir antiviral therapy, followed by specific therapy courses with Rituximab, Bendamustine, Polatuzumab. COVID-19 infection returned in July 2022. Lymphoma dynamic was negative. Chemotherapy was changed to Vinblastine, Cyclophosphamide, Bleomycin – with positive overall effect. Tests for COVID-19 infection regularly remain positive.

Summary. Current study demonstrates a case of multiple lymphoma relapses with following chemotherapy courses, COVID-19 infection setbacks after vaccine due to intense immunosuppression.

Conclusions. In this report, we show a patient with diffuse large B-cell lymphoma setback after COVID-19 infection. Even after antiviral therapy COVID-19 patients with hematologic malignancies may have prolonged active infection with impaired viral excretion.

TWO FACES OF IMMUNOTHERAPY: SEVERE HEPATOTOXICITY AND LONG-TERM RESPONSE IN PATIENTS WITH ADVANCED MELANOMA

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Keywords. Immunotherapy; Oncology; Melanoma; Autoimmune hepatitis

Introduction. Immunotherapy (IT), by triggering an anti-tumor immune system response, can improve survivability of cancer patients. Unfortunately, its use can cause a variety of side effects, including immune-mediated hepatitis, also with a severe course.

Case Description. A 46-year-old man was diagnosed with cutaneous melanoma in 2019. After surgical treatment (excision of the lesion and surrounding lymph nodes), the stage was set at pT4bpN1acM0. Complementary IT with pembrolizumab was administered. Seven months after its completion, PET/CT scan showed focal lesions in the lungs and pancreas. EUS with pancreatic biopsy was performed and the presence of melanoma metastases confirmed. IT nivolumab+ipilimumab was implemented. After 3 doses, CTC grade G2 hyperthyroidism was noted, requiring pharmacotherapy. After the 4th dose, an increase in aminotransferases > 500U/L (grade G3) was seen. A thick-needle biopsy of the liver revealed lesions consistent with autoimmune hepatitis. High-dose steroid therapy was implemented, with no improvement after 4 days. Mycophenolate mofetil was used as a second-line treatment with normalization of liver parameters after 4 weeks. IT was definitively terminated. Follow-up imaging studies showed a complete response, sustained for about a year now.

Summary. We report a 46-year-old-man who presented with cutaneous melanoma. After anti-PD1 monoclonal antibody therapy, he failed to achieve full therapeutic success. The implementation of combination anti-PD1 and anti-CTLA4 immunotherapy, despite causing severe autoimmune hepatitis, resulted in long-term remission, highlighting the potential of this innovative treatment for cancer patients.

Conclusions. IT is an innovative treatment, but it can cause life-threatening complications. Early recognition of side effects and prompt implementation of appropriate management is crucial. Even after treatment is discontinued, the patient may benefit in the long term, underscoring the value of IT in the treatment of cancer patients.

METABOLISM AND CARDIOVASCULAR DISEASES

A NOVEL APPROACH TO INCREASE OMEGA-3 POLYUNSATURATED FATTY ACIDS FOR CARDIOMETABOLIC DISEASE MANAGEMENT

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Objectives. The health benefits of omega-3 polyunsaturated fatty acids (PUFAs) are widely recognized in cardiometabolic disease management. Replacement of dietary saturated fatty acids (FA) with PUFAs reduces risks of cardiovascular diseases and type 2 diabetes. The aim of this study was to investigate a novel approach to increase PUFA levels for cardiometabolic disease management and measure PUFA and respective acylcarnitine (PUFAC) concentrations in experimental models of obesity using the LC-MS/MS method.

Materials and Methods. Plasma samples were collected from low-density lipoprotein receptor knock-out mice fed for 16 weeks of PUFA-rich high-fat diet (HFD) and standard HFD-treated control mice. Additional experiments to determine plasma PUFA concentrations were performed in Zucker rats, which were given daily oral doses of water or 10 mg/kg acylcarnitine level-lowering compound methyl-GBB for 12 weeks. A simple protein precipitation extraction (PPE) with ACN/MeOH (3:1, v/v) was used to extract plasma samples and the resulting extracts were analyzed using reversed-phase UPLC–MS/MS. The mobile phase consisted of gradient elution of 0.1% formic acid in water and ACN. Separation was achieved on an Acquity UPLC BEH C18 column.

Results. PUFA-rich diet prevented the development of atherosclerosis in mice and increased DHA and EPA concentrations 5 and 38 times, respectively, while corresponding PUFAC levels increased 12 and 23 times, respectively. Methyl-GBB treatment inhibited fatty acid oxidation and increased EPA and DHA concentrations 2-fold in the Zucker fa/fa rat plasma compared to control groups.

Conclusions. In conclusion, PUFA intake induces a similar increase in blood plasma concentrations of PUFAs and respective acylcarnitines. The developed analytical method could be used in clinical studies to validate PUFA and PUFAC plasma levels as markers of PUFA intake. The combination of omega-3 PUFA intake and inhibition of their metabolism is a very promising approach to increase omega-3 PUFA content and reach cardioprotective levels.

ADDITIONAL VALUE OF REPEATED ASSESSMENT OF LEFT VENTRICULAR FUNCTION AFTER ST-ELEVATION MYOCARDIAL INFARCTION

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Objectives. ST-elevation myocardial infarction (STEMI) remains a healthcare burden even though patient outcomes have significantly improved in recent years. Transthoracic echocardiography (TTE) is a cornerstone of establishing prognosis post STEMI. Current guidelines recommend follow-up imaging only in patients with left ventricular ejection fraction (LV EF) < 40%. However, global longitudinal strain (LV GLS) is recognized as a more sensitive tool to evaluate LV function and may therefore better risk-stratify patients. Aim of this study was to explore changes in LV GLS one year after STEMI and their potential prognostic value.

Materials and Methods. Data were analysed retrospectively from an ongoing STEMI registry. Patients with previous myocardial infarction, heart failure history, suboptimal image quality or missing follow-up were excluded. TTE was performed during index hospitalization and one year after STEMI. Relative LV GLS (Δ GLS) change was calculated. The endpoint was all-cause mortality.

Results. The study population consisted of 1409 patients (mean age 60 ± 11 years; 1059 (75%) men). Of all patients surviving at least one year after STEMI, a total of 87 patients died after a median follow-up of 69 (IQR 38–103) months. At one year follow-up LV EF improved from $50 \pm 8\%$ to $53 \pm 8\%$ ($p < 0.001$) and LV GLS improved from $14 \pm 4\%$ to $16 \pm 3\%$ ($p < 0.001$). Median Δ GLS was 14 (IQR 0.5–32)%. Optimal cut-off for Δ GLS was established on penalized spline curve as -7% . Cumulative 10-year survival was 91% in patients with Δ GLS $> -7\%$ versus 85% in patients with Δ GLS $\leq -7\%$ ($p = 0.001$). On multivariate Cox regression analysis Δ GLS $\leq -7\%$ remained independently associated with the endpoint after adjustment for age, troponin T, kidney function, chronic obstructive pulmonary disease, wide QRS complex, TAPSE and baseline LV GLS (HR 2.5 (95% CI 1.5–4.1); $p < 0.001$).

Conclusions. Significant improvement in LV GLS one year after STEMI has additional prognostic value on top of established clinical and echocardiographic risk factors.

CLINICAL SIGNS AND RISK FACTOR ANALYSIS OF WOMEN PATIENTS WITH INOCA – DATA FROM LATVIAN CARDIAC SPECT REGISTRY

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Objectives. A large proportion of symptomatic women referred to coronary angiography (CAG) have absence of coronary artery disease (CAD). Ischemia with non-obstructive CAD (INOCA) has been associated with cardiovascular risk (CVR) factors, although the prevalence of them remains unknown. Also, the INOCA endotypes are rarely correctly diagnosed and, therefore, no tailored therapy is prescribed. The aim of the study was to find the prevalence of women patients with INOCA referred to cardiac single photon emission computed tomography (SPECT) and to define the clinical characteristics of particular patient group.

Materials and Methods. Cardiac SPECT for women patients were performed from 2018 till 2022. Criteria for diagnosis of INOCA were symptoms of myocardial ischemia, absence of obstructive CAD, objective evidence of myocardial ischemia and / or impaired microvascular function. The diagnosis of suspected INOCA was defined if 3 out of 4 diagnostic criteria were present. The patients were analysed by clinical characteristics and CVR factors.

Results. 787 SPECT data were analyzed. True myocardial perfusion defect was detected in 140 patients (17.8%). For 120 (85.7%) of them the CAG was performed, of which 71 (59.2%) patients had non-obstructive CAD. Totally 66 women met 3 diagnostic criteria for INOCA. The mean age of them was 56.5 ± 9.4 years. 34 (51.5%) patients were overweight ($BMI > 25.0 \text{ kg/m}^2$) and 12 (18.2%) were current or ex-smokers. The most common presented CVR factors were dyslipidemia in 59 (90.8%) and arterial hypertension in 33 (50.0%) patients.

Conclusions. Women with high CVR and clinical suspicion of INOCA should be referred for cardiac SPECT to investigate myocardial ischemia. In these patients the further invasive testing of microvascular physiology performing intravascular measurements is planned to define INOCA endotypes.

DETECTION OF HIGH-RISK CORONARY PLAQUES USING INVASIVE AND NON-INVASIVE IMAGING MODALITIES

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Objectives. Both near-infrared spectroscopy imaging (NIRS) and non-invasive positron emission tomography/computed tomography (PET/CT) can identify active inflammation in coronary vessel plaques and help to choose the best treatment option. NIRS generated chemograms allow us to evaluate plaque lipid content, detect lipid-rich coronary plaques, and therefore determine the future prognosis. PET/CT can diagnose the active metabolism process within the coronary artery and indicate the potential inflammation in coronary plaque. Our study provides an example of comparing PET/CT with NIRS as a diagnostic tool for coronary artery disease.

Materials and Methods. Our study combined a literature review regarding [18F] FDG PET/CT and NIRS in the context of vulnerable coronary plaques and the case report series that included 4 males with early progressive atherosclerosis and stable coronary artery disease. All patients previously were on lipid-lowering therapy. After successful coronary angiography, IVUS/NIRS were performed in the target lesion vessel. The tip of the IVUS/NIRS catheter was positioned at least 10 mm distal to the target lesion. After identifying lipid-rich coronary plaque, patients were assigned to PET/CT within 2 weeks.

Results. From the site of meta-analysis, PET/CT's unique features make it a promising non-invasive tool to diagnose unstable coronary plaques and possibly to guide medical interventions in cardiovascular disease. In our study, NIRS imaging mean LCBI was 300.75 showing the vulnerable plaque. The patients' mean LDL-C level is 1.98 mmol/L. The average plaque burden index is 42.9%. After performing a PET/CT scan two patients showed possible inflammation in coronary plaque similar to NIRS imaging and the mean SUVmax was 3.206.

Conclusions. Our research demonstrates PET/CT and NIRS as different modalities for the detection of atherosclerotic process activity and disagreement in the findings between them. The correlation between PET/CT and NIRS in the detection of vulnerable plaques and TBR threshold value for exposure to plaque inflammation is a matter of further research.

DIAGNOSTIC AND PREDICTIVE SIGNIFICANCE OF IMPEDANCE CARDIOGRAPHY IN PATIENTS HOSPITALISED DUE TO DECOMPENSATED CHRONIC HEART FAILURE

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Objectives. To evaluate the role of transthoracic impedance cardiography (ICG) in the diagnosis and outcome prediction of patients who were admitted to the hospital due to chronic heart failure (CHF) decompensation and to compare ICG diagnostic and outcome prediction significance with other non-invasive CHF diagnostic tests.

Materials and Methods. The study sample consisted of 301 consecutive patients with a previous CHF diagnosis (166 men, 135 women) hospitalized due to decompensated CHF. CHF diagnosis was confirmed according to the most recent European Society of Cardiology guidelines. The patients underwent all recommended tests, additionally all patients underwent ICG, and selected patients underwent a 6-minute walk test (6MWT). ICG and 6MWT data were compared to other tests. Data about patient outcomes after discharge from the hospital were gathered from the Lithuanian Medical Record Database.

Results. There was weak to moderate correlation of 6MWT distance with main ICG data. There was weak correlation between left ventricular ejection fraction (LVEF) with thoracic fluid content index (TFCI) ($r = -0.163$, $p = 0.005$), systolic index ($r = -0.137$, $p = 0.017$), and systolic time ratio ($r = 0.236$, $p < 0.001$). There was weak correlation of amino-terminal pro-brain natriuretic peptide (NT-proBNP) with thoracic fluid content (TFC) and TFCI ($r = 0.204$, $p < 0.001$ and $r = 0.207$, $p < 0.001$, respectively). By multivariate Cox proportional analysis, the following parameters were independently associated with cardiac death (all $p < 0.001$): TFC ≥ 36.9 1/kOhm (hazard ratio [HR], 4.6, 95% confidence interval [CI] 2.7–7.8), LVEF $\leq 40\%$ (HR, 4.9, 95% CI 2.8–8.6), NT-proBNP ≥ 3598.45 pg/mL (HR 5.1, 95% CI 3.3–7.8).

Conclusions. The combination of non-invasively measured TFC, LVEF, and NT-proBNP showed great prognostic value for predicting cardiac death in patients with CHF.

DIAGNOSTIC VALUE OF APOLIPOPROTEINS IN TYPE 2 DIABETES MELLITUS

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Objectives. Research data revealed the importance of apolipoproteins (ApoA-I, ApoB, apoC-II, apoC-III, ApoD, ApoE) in the pathogenesis of dislipidemia in diabetes mellitus. The aim of the study was to establish the value of apoB/apoA-I ratio, serum apoB and apoC concentration as markers of cardiovascular disease (CVD) in patients with type 2 diabetes mellitus (T2DM).

Materials and Methods. A bibliographic study of the scientific literature (2018–2022, PubMed, Google Scholar) regarding the diagnostic role of apolipoproteins and changes in the content and spectrum of apolipoproteins in T2DM was done.

Results. The apoB/apoA-I ratio and serum apoB concentration were found to be higher in patients with T2DM and CVD compared to those with T2DM without CVD, suggesting that the apoB/apoA-I ratio may be an indicator of CVD. Significant correlations were also identified between apoB48 and carotid intima-media thickness, indicating that apoB48 levels may help predict arterial stiffness in middle-aged T2DM patients. Fasting apoB48 may be an independent marker of peripheral arterial disease in T2DM patients. ApoC-II levels are higher in patients with T2DM and CVD compared to patients without CVD. Plasma apoC-III concentration can strongly and independently predict coronary events in T2DM. Combined assessment of TRL (triglyceride rich lipoproteins)-related markers and LDL-C/apoB ratio may be of increasing importance in risk stratification in BAC patients with DM. In patients with acute coronary disease and DM undergoing emergency or elective coronary angiography, elevated apoB levels were an independent predictor of more frequent adverse clinical outcomes.

Conclusions. Serum levels of apoA, apoB, and apoC and ratios involving these apolipoproteins are informative markers of CVD risk in T2DM patients. Achieving metabolic control in diabetes is crucial in pulling back apolipoprotein levels to a desired level, mitigating CVD risk factors and also preventing CVD.

DIRECT ORAL ANTICOAGULANT USE: COMPLICATIONS FOR HIGH-RISK ATRIAL FIBRILLATION PATIENTS

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Objectives. Direct oral anticoagulants (DOACs) have become an alternatives to the long-standing standard of care in anti-coagulation, vitamin K antagonist. Anticoagulation is associated with clinical benefit in atrial fibrillation (AF) patients despite their elevated bleeding risk. With the expanding role of DOACs, clinicians are faced with increasingly complex decisions relating to appropriate agent and use in special clinical situations. The aim of this study was to analyze the DOACs use in patients with specific comorbidities and major drug interactions to promote effective DOAC prescribing.

Materials and Methods. Quantitative, analytic, cross-sectional clinical study during the period from December 2016 to January 2019, was performed at Pauls Stradins Clinical University Hospital, Center of Cardiology, Latvia. There were collected data about patients with AF under anticoagulative therapy ≥ 3 months, risk scores calculated by CHA₂DS₂-VASc and HAS-BLED. For quantitative measure anti-factor Xa and direct thrombin inhibitors tests were used. Data were analyzed using SPSS.

Results. In total, 31 patients were included; 61.3% were male; the mean age was 70.68 (SD \pm 8.34) years. The mean CHA₂DS₂-VASc and HAS-BLED scores was 3.9 (SD \pm 1.99) and 1.8 (SD \pm 0.96). The most common comorbidities were arterial hypertension (77.4%; 24), coronary artery disease (54.8%; 17) and diabetes mellitus (29.0%; 9). The mean body mass index (BMI) was 28.7 kg/m² (SD \pm 5.70); more than 30 kg/m² was 8 patients, so DOAC use must be considered. 77.4% used rivaroxaban, most frequently at increased dose 20 mg (41.9%; 13). Risk of significant drug-drug interactions was evaluated with statins (61.3%; 19), proton pump inhibitors (35.48%; 11) and anti-inflammatory drugs (22.58%; 7). There were correlation between BMI and C_{max} identified, higher for patients with lower BMI and vice versa ($p = 0.005$).

Conclusions. DOACs have revolutionized anticoagulant management and are becoming the cornerstone treatment for stroke prevention in AF treatment. Patient comorbidities must be considered when selecting most appropriate anti-coagulant and monitored routinely.

ENHANCED APOPTOSIS IN 3D ENDOTHELIAL CELL CULTURES EXPOSED TO HYPERGLYCAEMIA AND MICROGRAVITY

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Objectives. The space environment has specific stressors that are not found on Earth, including cosmic radiation and microgravity (μg). Astronauts, after long-term spaceflight, return with various health-related problems, including increased plasma glucose and induced diabetogenic state. It is unknown how these health-related alterations occur, and the interactions between μg and hyperglycaemia are not fully understood. In this study, we aimed to gain some insights by investigating endothelial cell changes in different gravity conditions and glucose concentrations.

Materials and Methods. We cultured EA.hy926 endothelial cells in simulated μg (s- μg) using a 3D clinostat and static normogravity (1g) conditions exposed to physiological and hyperglycaemic glucose levels. After two weeks, the samples were collected, and the expression of various ECM, inflammation and apoptosis-related genes were analyzed by qPCR and protein expression by the Western blot method. In addition, immunofluorescence and confocal microscopy techniques were used to investigate samples' morphological differences and protein distribution. Apoptosis was assessed by TUNEL staining.

Results. Our results indicate that hyperglycaemia did not affect the gene and protein expression in 1g conditions. In μg -conditions, which resulted in detached multicellular structures, hyperglycaemia increased the size and the number of spheroids, decreased fibronectin, transglutaminase-2, and increased NOX4, NF- κB , and caspase-3.

Conclusions. These results suggest hyperglycaemia activates programmed cell death. The findings bring new knowledge into the possible molecular pathways involved in diabetogenic vascular effects in μg .

FACTORS ASSOCIATED WITH INTENTIONAL DISCONTINUATION OF INSULIN THERAPY IN ADULT TYPE 1 DIABETIC PATIENTS HOSPITALISED FOR DIABETIC KETOACIDOSIS

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Objectives. Diabetic ketoacidosis (DKA) is a life-threatening complication of diabetes mellitus (DM) and is commonly seen in patients with DM type 1 (T1DM). This acute complication of T1DM is associated with high morbidity and mortality rates. Many patients experience repeated hospitalizations due to DKA. The condition of DKA usually requires a long period of hospitalization with high treatment costs. The aim of the work is to study the factors associated with intentional discontinuation of conventional intensified insulin therapy in adult with T1DM type patients hospitalized due to DKA.

Materials and Methods. In a retrospective study, medical history data of 120 adult patients were analyzed – demographic factors, number of hospitalizations due to DKA, severity of DKA and treatment outcomes, comorbidities, late complications of DM, and possible reasons for intentional discontinuation of insulin therapy. The study took place at the Riga Eastern Clinical University Hospital and the Paula Stradiņš Clinical University Hospital in the period from January 2019 to May 2022.

Results. The analysis of the research data shows that young, married, and employed men are most often hospitalized due to intentional discontinuation of conventional intensified insulin therapy with following development of DKA. More than a third of patients had repeated hospitalizations within one year. Most patients are diagnosed with severe DKA at the time of hospitalization. The mortality rate in the study patient population was 4.2%. The majority of patients had more than four comorbidities and at least one late complication of DM. The most common possible reasons for intentional discontinuation of insulin therapy were poor DM metabolic compensation and alcohol consumption.

Conclusions. Several factors are associated with intentional discontinuation of conventional intensive insulin therapy with following development of DKA in T1DM patients. Prospective clinical studies are needed to clarify the causal relationship between these factors for more effective prevention of DKA.

FATTY ACID ENERGY METABOLITES ACYLCARNITINES: HOW MUCH IS TOO MUCH?

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Objectives. Acylcarnitines are fatty acid and L-carnitine esters that are synthesized and metabolized in fatty acid metabolism pathways. Taking into account the size of the acyl group, as well as the enzyme and transporter preferences of different acylcarnitines, they can be classified as short-chain (acyl groups with two to five carbons), medium-chain (acyl groups with six to twelve carbons), long-chain (acyl groups with thirteen to twenty carbons) and very-long-chain (acyl groups with twenty-one and more carbons) species. Increased use of mass spectrometry approaches for biological sample analysis provides new opportunities for acylcarnitines as biomarkers, but the physiological roles of different chain-length acylcarnitines in some cases remain to be better understood. Thus far, multiple metabolomic profiling studies have found associations of changes in acylcarnitine concentrations with metabolic disorders, diabetes and insulin resistance, cardiovascular diseases, neurological disorders and certain types of cancer. More information is needed to define normal levels of acylcarnitines in comparison to concentrations characteristic of disease states. Increased long-chain acylcarnitine concentrations interfere with insulin signalling and induce detrimental effects on mitochondria, which can be reversed after lowering acylcarnitine levels. In contrast, a short-chain acylcarnitine (two carbon acyl-group), acetyl-carnitine, is used as a food supplement or experimental treatment for neurological conditions. Interestingly, several drugs, food supplements and dietary interventions induce changes in acylcarnitine profiles. Regulation of acylcarnitine synthesis or metabolism pathways might provide new therapeutic approaches in the future.

GENDER CHARACTERISTICS OF FACTORS OF RISK FOR MYOCARDIAL INFARCTION COMPLICATED BY ACUTE HEART FAILURE OF DIFFERENT CLASSES

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Objectives. To evaluate the differences in factors of risk of acute Q-myocardial infarction (MI) depending on the gender of the patients

Materials and Methods. The prospective study analyzed the data of 308 middle-aged (62.9 ± 0.6) MI patients, of whom 215 were men (69.8%) and 93 were women (30.2%). All patients were treated in the cardiology department

Results. It was established that among all the examined patients, 161 (52.3%) persons had acute heart failure (AHF) Killip I, 44 (14.3%) – AHF Killip II, 55 (17.8%) – AHF Killip III and 48 (15.6%) of patients – AHF Killip IV. Women were significantly older (68.3 ± 1.3) compared to (60.7 ± 0.6) men ($p = 0.0001$). Women had hypertension in the anamnesis more often – 96.7%, while in men the frequency of hypertension was 82.7% ($p = 0.0008$). Women had hypertension of the 3rd degree – 63.4% against 44, 2% among men ($p = 0.0006$). Among male patients, persons with hypertension lasting up to 5 years predominated, (37.1%), and among women – only 21.5% ($p = 0.006$), had hypertension more than 10 years (48.4%) at the same time 22.8% ($p = 0.0002$) of men. Patients with MI did not differentiate significantly in body mass index (BMI) ($p = 0.29$), but 64.2% of men had a BMI below 29.9 kg/m^2 , while only 49.5% of women had the same issue ($p = 0.015$). Type 2 diabetes was more often diagnosed among women – 27.9 (12.1% of men), respectively ($p = 0.0006$). It was determined that there are comparatively more men in the younger and middle age groups. In the age group of 60–69 years, the percentage correlation doesn't differ, and in the age group over 70 years, the part of women increases – 51.6%, ($p = 0.0001$)

Conclusions. Among the gender differences in MI risk factors, older age of women, a longer history of hypertension among women, and a higher percentage of women with type 2 diabetes compared to men were identified

HIGH-RISK CORONARY PLAQUE FEATURES – FROM STRUCTURAL TO MOLECULAR IMAGING

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Objectives. Cardiovascular disease remains the leading cause of death globally. For more individualized preventive therapy strategy there is a need to use the best imaging to better assess diagnosis and for risk stratification. There is still no dedicated and precise test that could predict plaque rupture that is the most frequent cause of myocardial infarction. There is a need to optimize diagnostic and risk stratification pathways for best patient outcome.

Materials and Methods. Our study combines the latest literature review about noninvasive plaque imaging methods and our first patient results. We evaluated coronary arteries for 13 patients randomly who were undergoing an oncological body [18F] FDG PET/CT exam. [18F]FDG injection was 2.1–2.2 MBq per kg, scanned 60–90 min after injection, 3 min per bed. Anatomy was determined by low dose CT image without breathhold. Further these two patients were evaluated in cardiologist consultation, underwent IVUS/NIRS exam.

Results. From our 13 patients 6.5% (n=2) showed only faint focal uptake (SUVmax 3.2; liver SUVmax 3.0) in the coronary artery wall in PET attenuation corrected image. For both patients IVUS/NIRS were performed in the target lesion vessel. No correlation was found in two patient exams between non-invasive advanced molecular [18F] FDG PET/CT images and intravascular ultrasound.

Conclusions. Our small study sample showed that hot plaques may not be seen too often in oncology patients. No correlation could be explained by too faint metabolic activity that may not have significance and different processes seen in images. IVUs shows fibrous tissue, necrotic core, fibro-fatty tissue and dense calcium while macrophages as an inducer of the inflammation are believed to be a major contributor to [18F]FDG uptake in atherosclerosis. Larger studies with different tracers in conjunction with anatomic imaging (CTA) are needed to show a more realistic picture and hopefully help to noninvasively find culprit lesions before major cardiovascular events.

IDENTIFICATION PROGRAMME FOR POTENTIAL CARDIOVASCULAR RISK FACTORS FOR MASTER ATHLETES

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Objectives. Master athletes are defined as sportsmen over 35 years of age who either trains for or takes part in athletic competitions designed for older participants, for example road running, cross country running, basketball, ice hockey and many more. This population presents a higher risk for sudden cardiac death or life-threatening clinical events compared to leisure sportsmen. Although this is a non-homogenous group of different age groups, physical exertion levels and demands in each sports disciplines some similarities arise as potential risk factors. There have been studies that propose potential pathophysiological mechanisms that could tribute to sudden cardiac death, the most common reason being coronary artery disease. Till now not much targeted research has been done in this field of master athletes and their cardiovascular health screening. Keeping in mind that this is and will be a growing population as our society is getting older and physical activities are encouraged in older age more research would benefit this population with the potential to prevent sudden cardiac death. A deeper understanding of this population would help to develop identification program for potential cardiovascular risk factor among master athletes and develop recommendations for their cardiovascular health screening. This lecture focuses on brief introduction in research done till now, how this population is different from general population or leisure sportsman, potential pathophysiological mechanisms that can lead to sudden cardiac death and the potential for further research that would benefit this population.

LIPOPROTEIN (A) AS ADDITIONAL MARKER FOR CARDIOVASCULAR RISK ASSESSMENT

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Objectives. Lipoprotein(a) (Lp(a)) is macromolecular complex of low-density lipoprotein and protein apolipoprotein (a), which can be used as an indicator of increased risk of early atherosclerosis. Lp(a) level is genetically determined and this complex doesn't excreted by the liver. Lp(a) level is not affected by diet or physical activity. Lp(a) alone increases the risk of CVDs by 1.2 times, but Lp(a) and smoking – 3.6 times. High Lp(a) with high LDL-cholesterol increase risk of CVDs by 12 times, but together with elevated homocysteine – 30 times. Therefore, it would be useful to measure Lp(a) in all patients with a complicated anamnesis, even with a normal lipidogram. Aim of the research is to understand how many Lp(a) were determined annually and how many and how many of them were with and without lipidogram changes.

Materials and Methods. Analyzer: Roche, Cobas Pro (c503). Detection methods are: Lp(a) – Particle enhanced immunoturbidimetric assay. Total cholesterol – Enzymatic, colorimetric assay. LDL and HDL cholesterol: Homogeneous enzymatic colorimetric assay.

Results.

- 398 Lp(a) were analyzed in period of 01.12.2021-01.12.2022.
- High Lp(a) level was detected in 95 (23,87%) cases.
- From 95 cases: 45.26% were with no changes in the lipidogram, 44,21% were with high LDL-cholesterol and total cholesterol, but in 10,53% lipidogram wasn't determined.
- In 303 (76,13%) cases with normal Lp(a) level : 48,84% were with no changes in the lipidogram, 47,52% were with high LDL-cholesterol and total cholesterol, but in 3,64% lipidogram wasn't determined.
- In period of 01.12.2021-01.12.2022 325342 tests of total cholesterol were analyzed and only in 0.12% cases Lp(a) was also determined.
- 44,38% from these tests were with total Cholesterol level < 5.0 mmol/L, Of that number, 57,750 patients might have elevated Lp(a) provisionally.

Conclusions. The Lp(a) test is not widely used, despite its importance. Using Lp(a) determination together with a routine lipidogram could detect patients at high risk of CVDs more quickly.

MELDONIUM INCREASES FUNCTIONAL CAPACITY OF PATIENTS WITH CHRONIC RIGHT VENTRICULAR FAILURE

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Objectives. Right ventricular (RV) failure is the main cause of death in patients with pulmonary arterial hypertension (PAH). The cardioprotective drug, meldonium, induces cardioprotective effects by decreasing synthesis of long-chain acylcarnitines and their accumulation in heart tissues. A recent study showed that meldonium attenuated the development of RV failure in a preclinical PAH model (Vilskersts et al., 2021).

This study was conducted to assess the effects of meldonium on the functional capacity and plasma biochemical profile of PAH patients with RV failure.

Materials and Methods. This study was carried out in RV failure patients who received etiological treatment for PAH for at least 3 months and the same period did not have documented exacerbations of the disease. Meldonium was administered twice a day at a dose of 500 mg for 30 days. Before and after the treatment at week 4, the 6-minute walk test (6MWT) was performed and blood samples were collected to characterize the plasma biochemical profile.

Results. Twenty PAH patients with chronic RV failure were included in the study. Among all patients, 75.0% were female. The mean age of the patients was 70.4 ± 13.2 years. The 6MWT before and just after meldonium treatment was 356.6 ± 115.4 m and 402.8 ± 129.9 m ($p = 0.022$), respectively. Treatment with meldonium decreased Borg dyspnea scale after activity compared to examination before the treatment ($p = 0.003$). The concentration of B-type natriuretic peptide in the plasma before and after meldonium treatment was 159.0 ± 133.9 pg/mL and 165.3 ± 135.9 pg/mL, respectively. There were no differences in the vital parameters in patients before and after meldonium treatment.

Conclusions. Meldonium treatment increases functional capacity and decreases dyspnea in patients with chronic RV failure. Our results suggest that meldonium might be a novel drug for the treatment of RV failure.

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MITOCHONDRIAL GENOME VARIATION DEMONSTRATES ASSOCIATIONS WITH CORONARY ARTERY DISEASE AND A PLETHORA OF WELL-ESTABLISHED DISEASE RISK FACTORS AND DIETARY PREFERENCES

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Objectives. Coronary artery disease (CAD) is a complex disease, driven by genetic and lifestyle factors. Currently identified single-nucleotide variants (SNVs) associated with CAD explain < 20% of the disease heritability, whereas the contribution of lifestyle factors, such as dietary preferences, has remained less investigated. Here, we hypothesized that mitochondrial (MT)-SNVs might present one potential source of this ‘missing heritability’ and could be related to additional traits, further modulating disease risk.

Materials and Methods. We selected 20,405 CAD cases from the UK Biobank, using a stringent definition of myocardial infarction and/or revascularisation vs. controls. After quality control and imputation, 201 common/low-frequency (MAF > 1%) MT-SNVs were subjected to association analyses with CAD, as well as 109 additional traits, including 24 well-established risk factors (age, hypertension, high cholesterol levels, smoking) and 85 dietary preferences from food frequency questionnaires.

Results. We identified 3 study-wide significant ($P < 2.26 \times 10^{-6}$) MT-SNVs conferring increased CAD and type 2 diabetes risk: m.10400C > T (ND3), m.14783T > C and m.15043G > A (CYB). m.10400C > T and m.14783T > C were also found more frequently in individuals displaying high triglycerides and less frequently in those being physically active. The same MT-SNVs were associations with several dietary habits related to alcohol (any type from red wine to spirits), coffee/tee, water, sugar, egg and dairy consumption, the daily amount of fruit (fresh/dried) and vegetables (raw/cooked), as well as preferences related to type/amount of milk (full cream vs. skimmed), spread (flora/benecol vs. butter/margarine), cereal (muesli vs other) and bread (wholemeal vs. other).

Conclusions. Overall, our results suggest that MT-SNVs demonstrate associations with CAD and a plethora of well-established disease risk factors and dietary preferences. Further studies are needed to conclusively determine the role of MT-SNVs in modulating susceptibility to CAD.

MODERN THERAPY POSSIBILITIES FOR SEVERE METABOLIC LACTACIDOSIS

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Objectives. Background. Metformin-associated lactic acidosis is a rare but a high mortality metabolic state for people with type 2 diabetes mellitus (DM2) and present kidney damage. Blood pH lower than 6.8 is not compatible with life, however, with modern treatment possibilities like continuous hemofiltration (CVVH) there is a possibility to treat the patient and partially restore their kidney function resulting in a positive prognosis.

Objective: The objective is to determine how acute CVVH can change the outcome in severe metformin-associated lactic acidosis compared to conservative therapy.

Case presentation. A 71-year woman was admitted to Riga East Clinical University Hospital. The patient had been physically weak for about a month, had reduced appetite and has slimmed 18 kg. She was dizzy, couldn't speak properly and had hallucinations. Patient had repeated bouts of vomiting and diarrhea the day before after which her condition worsened. Previous recorded illnesses – CKD IIIA (GFR 53.12 mL/min july 2020.), DM2, non-insulin dependant, coronary heart disease, PAH with TODs.

Objectively her condition is very serious. BP 110/60 mmHg; Cor 78x/min, rhythmic. Oliguria. The patient is responsive but disoriented, confused. Mucous membranes are dry. Blood pH is < 6.8 and hyperkalemia which indicates severe metabolic acidosis (GFR 7.24 mL/min, Creatinine 537 μmol/L, potassium 8.01 mmol/L) due to hypovolemic state. No changes are noted in radiology finds. Based upon vital indications – hyperkalemia and severe lactacidosis – acute CVVH was started. After CCVH treatment kidney function is partially restored (GFR 34.17 mL/min, Creatinine 140 μmol/L, K 2.81 mmol/L) with normal diuresis.

Conclusion. CVVH has proven to be a more effective therapy than conservative therapy in the case of metformin-associated lactic acidosis. An early treatment with CVVH shows a positive dynamic with partially restored kidney function in the span of approximately 48 hours for a metabolic state that otherwise would cause patients *excitus letalis*.

MODIFIABLE CARDIOVASCULAR RISK FACTOR PREVALENCE AMONG MASTER ATHLETES IN LATVIA

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Objectives. Master athletes is growing population in Latvia and around the world. Compared to younger athletes this group have more medical conditions which untreated could lead to sudden cardiac death or life-threatening clinical events. The aim of the study is to screen master athletes population to identify modifiable cardiovascular (CV) risk factors (RF).

Materials and Methods. Prospective study (May 2022 to January 2022) enrolling master athletes in competition level basketball. Questionnaire about CV RF, demographic data and anthropometric measurements were made. Data were collected, descriptive analysis was made using IBM SPSS Statistics 26.0.

Results. Altogether 54 participants: 83.3% (45) – male (M), 16.7% (9) – female (F); average age – 64 years (SD 9.3). Arterial hypertension (AH) for 33.3% (18) participants in anamnesis, during blood pressure (BP) measurements at rest elevated BP for 48.1% (26) of participants of which 65% (17) had AH in anamneses. Diabetes anamnesis for 3.7%

(2) participants. Current smokers – 13.2% (7); 53.8% (29) have smoked at some point. Dyslipidemia in anamneses – 22.2% (12), of which 41.7% (5) participants said using cholesterol lowering drugs. Altogether cholesterol lowering drugs were used by 17% (9). Normal Body Mass Index (BMI) – 31.5% (17); 16.7% – obese (obesity class 1 – 13% (7); class 2 – 1.9% (1); class 3 – 1.9% (1)); overweight – 51.9% (28). Normal waist size for 22.2% (12) (M 78–94 cm, F 64–80 cm) of athletes, 35.2% (19) overweight (male 94–102 cm, F 80–88cm), 42.2% (23) obese (M \geq 102 cm, F \geq 88 cm).

Conclusions. Master athletes is a group where multiple CV risk factors, most commonly obesity (42.2%), can be seen. It emphasizes the necessity for closer cardiovascular screening and RF modification for this group of patients.

NOVEL GENETIC LOCI IN PATHOGENESIS OF AUTOIMMUNE THYROID DISEASES AND THEIR RELATIONSHIP WITH SELENIUM STATUS

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Objectives. Genetic, immune, and environmental factors strongly contribute to the development of autoimmune thyroid disease (AITD) such as Graves' disease (GD) and Hashimoto thyroiditis HT). Selenium is one of the most discussed exogenous factors in the pathogenesis of AITD. The aim was to assess the association of genetic factors with selenium levels and blood immuno-molecules in an adult cohort with HT and GD, and healthy controls.

Materials and Methods. A total of 2692 subjects were included in a cross-sectional study. They were divided into 3 groups: GD (N = 148), HT (N = 102), and a control group (N = 2442). Diagnosis of AITD was based on laboratory. In addition, serum cytokine concentrations were measured and selenium status was evaluated by measuring serum selenium, selenoprotein (SePP) levels, and glutathione peroxidase-3 (GPx3) activity. The genotypes were determined using genome wide genotyping, imputation was carried out using TOPMed r2 imputation panel and association analysis was performed with PLINK2.9.

Results. Out of 2692 participants 1684 were female (62.6%), 1008 – male (37.4%). Mean age was 54.3 years (SD 14.0) in the Control Group, 48.4 (SD 15.6) in GD, and 48.3 (SD 15.6) in HT patients. Mean selenium level was 84.4 µg/L (SD 31.3), 69.3 µg/L (SD 17.1), and 83.4 µg/L (SD 27.0) in the respective groups. The overall cohort selenium level was below the reference levels (80–125 µg/L) for 62% of the participants with GD patients having significantly lower levels. We did not observe any significant association of genetic loci with SePP levels, or 18 different cytokine levels measured. Nevertheless, the obtained results demonstrate four novel loci associated with higher plasma selenium levels (WDR49, RTN4IP1, MYL6P4, LINC02338), one with increased GPx3 activity (TPCN2), three with GD (LSAMP, HNRNPA3P5, NTN1) and one with HT (VAT1L).

Conclusions. The novel loci associations could be attributed to population-specific effects or unknown stratification in our cohort, and further assessment of these hits are required to explain the relation of genetic traits with studied AITD and other.

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ORAL ANTICOAGULANT USAGE AMONG HIGH-RISK ATRIAL FIBRILLATION PATIENTS AND THEIR BENEFITS

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Objectives. Oral anticoagulants (OAC) can be divided in two groups: K vitamin antagonists, most commonly warfarin used in Latvia and direct oral anticoagulants, such as rivaroxaban, edoxaban, apixaban and dabigatran. This diverse group of medication should be prescribed for high risk (CHA₂DS₂-VASc equal or more than 2 points for male patients and 3 or more points for female) atrial fibrillation patients who does not have moderate to severe mitral valve stenosis or prosthetic mechanical valve replacements in medical history. OAC by acting on different steps of coagulation cascade prevents patient from thrombus development in left atrial appendage and therefor further risk for thromboembolism in cerebral arteries causing cerebral infarction. The cerebral infarction prevention by using oral anticoagulants lets patients with high-risk atrial fibrillation live a healthier and longer life, preserving both physical health as well as health-related quality of life in the long term. Both oral anticoagulant types have their pros and cons and a deeper understanding of their mechanism of work should be understood to choose the most appropriate treatment for the patient. This lecture focuses on reveling how different oral anticoagulants can affect our physical and mental health in long run through different mechanisms and gives a deeper understanding of this drug class.

OREGON SUDDEN UNEXPECTED DEATH STUDY (SUDS) ELECTROCARDIOGRAPHIC RISK ASSESSMENT OF SUDDEN CARDIAC DEATH FOR MASTER ATHLETES IN LATVIA

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Objectives. Oregon Sudden Unexpected Death Study (SUDS) is an ongoing study that has distinguished electrocardiographic parameters that correlate with increased risk for sudden cardiac death (SCD) in population. The objective is to evaluate electrocardiograms (ECG) of basketball master athletes for markers of increased risk for SCD. In the Oregon SUDS the patients who had SCD 16% of them had ≥ 4 markers, which was associated with 21.2% risk of SCD, while the control group around 3%.

Materials and Methods. Prospective cross-sectional study (January 2022 – December 2022) was made including competition level basketball master athletes. During their training session a questionnaire about demographic data, lifestyle was conducted, ECGs were made. Data was collected and analyzed using descriptive and inferential statistics (Spearman's One-Tailed correlation) using IMB SPSS Statistics 26.0.

Results. Altogether 54 participants: 83.3% (45) – male (M), 16.7% (9) – female (F); average age – 64 years (SD 9.3). ECG findings: resting heart rate > 75 bpm – 42.6% (23) of participants; left ventricular hypertrophy according to Sokolow-Lyon criteria – 11.1% (6); prolonged QTc interval (> 450 ms in men, > 460 ms in women) – 20.4% (11); QRS-T angle > 90 degrees – 7.4% (4); delayed QRS transition zone (in at least lead v5) – 14.8% (8), prolonged Tpeak-to-Tend (> 89 ms) – 27.8% (15). Of all participants 35.2% (19) had 1 marker; 24.1% (13) – 2 markers; 27.8% (15) – 3 markers; 9.3% (5) – 4 markers; 1.9% (1) – 5 markers; 1.9% (1) – 6 markers. The sum of the markers did not have correlation with the age ($p = 0.202$), gender ($p = 0.401$) or smoking status ($p = 0.418$).

Conclusions. Of all the research participants among competition level basketball master athletes 13.0% (7) had ≥ 4 markers on ECG that correlate with increased risk of sudden cardiac death; the sum of markers did not have correlation with age, gender, or smoking status.

PSEUDOANEURYSM OF THE DESCENDING THORACIC AORTA AND AORTO-OESOPHAGEAL FISTULA

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Objectives. Aorto-esophageal fistula (AEF) is a rare but life-threatening cause of upper gastrointestinal bleeding associated with highly fatal conditions, regardless of the chosen treatment technique.

A 74-year-old male on the 27th of July was admitted to the Riga East Clinical University Hospital (RAKUS) with increasing weakness and anemia. A patient refused further treatment and diagnosis and left the hospital. As the complaints progressed, the patient arrived at the Jurmala hospital, where anemia persisted. Upper Gastrointestinal endoscopy (EGD) was performed. An EGD showed no clinically significant pathology and the patient was discharged for ambulatory treatment. On the 31 of August patient was admitted to the RAKUS with hematemesis and melena. He presented with hypotension (62/30 mmHg). Laboratory results revealed a hemoglobin of 6.7 g/dL, erythrocytes $2.51 \times 10^6/\mu\text{L}$, and reactive C protein of 114.0 mg/L. After therapy of norepinephrine and fluid resuscitation (S. Ringeri-Lac 500 mL), the patient recovered from the hemorrhagic shock. Based on symptoms, and previous results of the EGD a CT angiography of the chest and abdomen was performed. Conclusion – Descendent aortic pseudoaneurysm with a fistula to the esophagus. The council of doctors decided to start conservative therapy. The patient received transfusions of two red blood components, two FFP transfusions, vasopressor support (Norepinephrine), continuous IV infusions of tranexamic acid 2 mg/kg/h, and Octaplex 1000 IU. On the 11th of September laboratory results revealed a Hb 9.8 g/dL and other results within a normal value. The patient was discharged from the hospital.

Conclusion. This case reports a successful strategy for the conservative treatment due to statistically adverse data of this treatment method. This indicates that there are no exact criteria for choosing a treatment strategy and it must be chosen individually for each patient.

SPIRONOLACTONE FOR ATRIAL FIBRILLATION RECURRENCE REDUCTION AFTER SUCCESSFUL ELECTRICAL CARDIOVERSION

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Objectives. Pleiotropic effects of non-antiarrhythmic medications have gained increased attention. Indirect antiarrhythmic action of mineralocorticoid receptor antagonists could help attenuate atrial fibrillation (AF) recurrence after sinus rhythm restoration. Aim of this study was to evaluate the effect of spironolactone on AF recurrence prevention after electrical cardioversion (ECV).

Materials and Methods. Observational study enrolled patients admitted for elective ECV in whom sinus rhythm was successfully restored. ECV procedure was performed according to protocol accepted in the hospital. Informed consent was signed, confirming participation in the study, and baseline demographic and clinical data were acquired based on available medical documentation. Afterwards, 1-, 3-, 6-, 9- and 12-month follow-up was conducted. Data of sinus rhythm maintenance within 12 months was analyzed regarding medication intake until the point of arrhythmia recurrence. Statistical analysis was performed using IBM SPSS Statistics software. Significance level was defined for $P < 0.05$.

Results. Data on 100 patients was analyzed. 53 study participants experienced AF recurrence within 12 months since successful ECV. Comparing patient groups remaining in sinus rhythm and having experienced AF relapse, there was no significant difference in proportions of antiarrhythmic medication intake, including beta-blockers ($P = 0.692$), amiodarone ($P = 0.256$), ethacizine ($P = 0.714$), propafenone ($P = 0.652$) and sotalol ($P = 0.169$). Statistical significance was established for patients receiving spironolactone ($P < 0.001$). Add-on spironolactone significantly reduced risk for one-year arrhythmia recurrence by 66.2% (OR 0.338, 95%CI 0.120-0.956, $P = 0.041$).

Conclusions. Results of the study demonstrated that presence of spironolactone in pharmacotherapy after ECV significantly improves one-year outcomes, reducing odds for AF recurrence. These findings suggest addition of spironolactone as a promising approach with clinical benefits for post-cardioversion arrhythmia-free survival.

STATIN-INDUCED ADVERSE EFFECTS IN MITOCHONDRIA: EVIDENCE FROM HMGCN KNOCK-OUT MICE

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Objectives. Treatment with statins, competitive HMG-CoA reductase (*Hmgcr*) inhibitors, result in adverse effects on mitochondria functionality in some patients (1–20%). However, molecular mechanisms of statin-induced mitochondrial dysfunction are not fully understood. Currently suggested causes for this phenomenon are coenzyme Q10 deficiency, inhibition of respiratory chain complexes and protein prenylation as well as induction of the mitochondrial apoptosis pathway.

Materials and Methods. We used the tamoxifen-inducible *Hmgcr* knock-out (KO) mice model, multi-omics strategy, and mitochondrial functionality assessment to study whether the deficiency of the *Hmgcr* enzyme induces detrimental changes in energy metabolism pathways.

Results. The development of severe phenotype was observed in female and male mice shortly after tamoxifen-induced *Hmgcr* gene KO. Liver damage was demonstrated by histology findings and highly elevated ALAT concentration in blood plasma. Measurements in plasma and liver samples showed marked changes in fatty acid and glucose metabolism, including elevated fatty acid and triglyceride levels in the liver in concert with hypoglycemic measures in plasma. Metabolome and transcriptome analysis indicated on substantial changes in peroxisomal and mitochondrial metabolism pathways. A reduced number and disturbed functionality of mitochondria and peroxisomes were found in functional assays, immunohistochemical staining, and metabolite analysis of the *Hmgcr* gene KO mice samples. The accumulation of long-chain acylcarnitines and hydroxyl-acylcarnitines at high levels revealed a deficiency in fatty acid beta-oxidation were characteristic for the model animals.

Conclusions. In conclusion, decreased mitochondrial beta-oxidation in the liver of *Hmgcr* KO mice is the first biochemical change that leads to the accumulation of long-chain acylcarnitines at harmful levels. At a later stage, peroxisomal dysfunction determines the progression of liver failure. HMG-CoA reductase is a mandatory enzyme for undisturbed mitochondrial beta-oxidation and its complete inhibition might result in adverse reactions.

TENDENCIES IN ORAL ANTICOAGULANT USAGE FOR HIGH-RISK ATRIAL FIBRILLATION PATIENTS OVER PERIOD OF 5 YEARS AND CORRELATION WITH SURVIVABILITY

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Objectives. Anticoagulant usage for high-risk non-valvular atrial fibrillation patients is the cornerstone for stroke prevention. A choice between K vitamin antagonists (mainly warfarin) and direct oral anticoagulants (DOAC) can be done. Aim of this study is to observe the tendencies of oral anticoagulant usage among high-risk atrial fibrillation patients over period of five years and its correlation with survivability.

Materials and Methods. A prospective longitudinal study was carried out from November 2016 to January 2022, including patients who were hospitalized in Pauls Stradins Clinical University Hospital or Riga East University Hospital. Questionnaire about demographic data, medical history, used medication was made at the enrollment and on follow-up after five years. All data were collected, statistical analysis (T-test, Spearman Correlation) was made using IBM SPSS Statistics 26.0.

Results. Altogether 328 patients included, 5-year follow-up with 210 patients. On follow-up: males 58.1% (122), females 41.9% (88), average age at inclusion 71.0 years (SD 9.1). At enrollment (2016 – 2018), warfarin used 38.8% (81), DOAC – 35.4% (74) of which 23.0% (48) rivaroxaban and 12.4% (26) – dabigatran. Patients who did not use OAC for any reason (non-users) – 25.8% (54). At 5-year follow-up alive were 78.1% (164) of patients. At follow-up the DOAC used 75.4% (107) (rivaroxaban 50% (71), dabigatran 17.6% (25), apixaban 7.7% (11)), warfarin used 13.4% (19) and non-users – 11.3% (16). The average age for non-users was 72.6 years (SD 8.5 years), for OAC users – 70.4 (SD 9.17), Homogeneity of both groups were tested using T-test ($p = 0.14$). At 5-year follow-up a statistically significant difference (Spearman Correlation, $p = 0.002$) was between survival rate for non-users (63.0% (34)) and OAC users (83.2% (129)), favoring OAC users. No statistical difference between survivability was found comparing warfarin users to DOAC users ($p = 0.14$).

Conclusions. A statistically significant difference ($p = 0.002$) was found between the 5-year survivability comparing OAC users and non-users, favoring OAC users.

TO PACE OR TO DEFIBRILLATE – CLINICAL PRESENTATION OF SCN5A OVERLAP SYNDROME

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Objectives. A 33 years old woman presented to cardiology clinic with a history of a syncope after waking up. On clinical investigation she had asymptomatic sinus bradycardia during day-time and intermittent type II second degree atrioventricular block during night-time. Echocardiography and cardiac magnetic resonance imaging did not show any structural or functional abnormalities. Common bradycardia causes (medication, metabolic, systemic and neurologic diseases) were excluded and whole exome sequencing was performed – patient was positive for heterozygous likely pathogenic variant *SCN5A* NM_000335.4:c.3820G > A, p.Asp1274Asn. This particular variant is known to be associated with progressive cardiac conduction disease, sick sinus node disease, Brugada syndrome and dilated cardiomyopathy. Ajmaline test was negative, therefore Brugada syndrome was excluded and decision to implant a pacemaker was made. The mother (67 years old) of an index case had long-standing complains about palpitations, light-headness and she also experienced two syncopes previously. On previous clinical investigation she had only few ventricular premature beats (PMB) and no structural or functional abnormalities of the heart. Genetic testing was also performed – mother had same *SCN5A* heterozygous variant. Patient was admitted to cardiology ward to undergo ajmaline testing and new Holter monitoring. During recording there were multiple sinus arrest and complete atrioventricular block episodes, 33 000 monotypic ventricular PMB and spontaneous transient type 1 Brugada pattern. Therefore, a diagnosis of overlap syndrome (PCCD and Brugada syndrome) was made in mother with no need for ajmaline test. Due to high risk of sudden cardiac death in Brugada syndrome patients a cardioverter-defibrillator (ICD) was implanted. Cascade screening is ongoing in this family. This clinical case highlights the importance of genetic testing in diagnosis, treatment of cardiovascular disease and decision on which device to implant in particular.

TRIGLYCERIDE-ASSOCIATED CORONARY LUMEN AREA INCREASE IN PATIENTS RECEIVING INCLISIRAN AS ADD-ON LIPID-LOWERING TREATMENT

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Objectives. Triglycerides are an established risk factor for adverse cardiovascular events, though less emphasized for novel PCSK-9 gene-silencing hypolipidaemic medication inclisiran. Aim of this study was to evaluate the effect of inclisiran on plasma triglyceride levels and coronary artery lumen area in intravascular imaging.

Materials and Methods. Study was conducted among stable coronary artery disease patients admitted for elective percutaneous coronary intervention and having non-haemodynamically significant plaque 20–50% in proximal/middle third of coronary artery, corresponding to segment of interest. Intravascular ultrasound (IVUS) was performed at baseline and after 15 months, evaluating mean lumen area. All participants received statin to maximum tolerated dose and/or ezetimibe for at least one month prior to inclusion. In patients having low-density lipoprotein (LDL-C) levels > 1.8 mmol/L, add-on inclisiran was started. Plasma lipid profile changes were also evaluated. For data analysis SPSS Statistics software was used with defined significance level of 0.05.

Results. In 25 eligible patients IVUS investigation was performed, among which 15 were assigned to receive inclisiran. Baseline triglyceride levels were 1.71 (\pm 0.89) mmol/L and 1.52 (\pm 0.45) mmol/L in inclisiran and statin/ezetimibe groups, respectively (P = 0.164). In inclisiran group, data demonstrated significant reduction of triglyceride levels by 32.7% (-0.56 , 95%CI -0.89 to -0.22 , P = 0.003) for 15-month pooled data, as well as significant increase of mean lumen area by 8.41% (0.74 , 95%CI 0.26 to 1.22 , P = 0.003). Among statin/ezetimibe users difference of triglyceride levels (-0.10 , 95%CI 0.71 to 0.51 , P = 0.703) and mean lumen area (2.08 , 95%CI -0.09 to 4.24 , P = 0.058) was nonsignificant. Achieved LDL-C levels were similar in both groups – 1.70 (\pm 0.65) mmol/L in patients receiving inclisiran and 1.59 (\pm 0.56) mmol/L in statin/ezetimibe group (P = 0.242).

Conclusions. Inclisiran add-on therapy resulted in plasma triglyceride reduction with clinical benefit observed in increase of coronary artery lumen area, when compared to statin and/or ezetimibe alone, in presence of achieved LDL-C target, possibly lowering residual risk.

TRIMETHYLAMINE N-OXIDE – CARDIOMETABOLIC DISEASE RISK FACTOR OR AN OSMOLYTE?

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Objectives. Trimethylamine *N*-oxide (TMAO) is a small molecule generated from intestinal microbiota metabolism of choline and carnitine, therefore plasma levels of TMAO are highly dependent on dietary factors and intestinal microbiota composition. Previously, TMAO was described as an osmolyte that protects cells from osmotic and hydrostatic pressure in deep-sea organisms; however, since 2011 it has been considered a risk factor for cardiometabolic diseases. Despite growing evidence in various patient populations, it is still debated whether TMAO itself exerts detrimental effects or is merely a bystander. The strongest evidence base covers the atherogenic effects of TMAO, namely, aggravated inflammation, stimulation of foam cell formation, and suppression of reverse cholesterol transport. However, the results of preclinical studies are not unanimous, and our data from *ex vivo* models do not reveal any differences in endothelial function, cardiac function, and infarction size upon acute administration of TMAO. Furthermore, concentration differences in TMAO levels in target tissues must be considered, as we have evidence that TMAO accumulates in the kidneys, resulting in 4- to 10-fold higher concentrations compared to other tissue in rodents after supplementation with TMAO. Subsequently, the kidney mitochondria are also most affected by TMAO, as we observe impaired pyruvate metabolism, leading to increased ROS production. In contrast, in the heart, where TMAO tissue content was lower, we observed preserved mitochondrial energy metabolism and cardiac functionality in experimental model of heart failure. Moreover, data from patients with diabetes indicate that plasma TMAO levels strongly correlate with a marker of kidney tubular damage, which should be an additional exclusion criterion when addressing the validity question of TMAO as a cardiometabolic risk marker. Overall, it seems that the effects of TMAO could depend on the duration of exposure, the composition of the diet, and the disease model; furthermore, the effects can be tissue-specific.

VARIATIONS OF TESTOSTERONE LEVEL BY AGE, TIME AND SEASON IN LARGE MALE COHORT

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Objectives. Testosterone is an essential hormonal parameter, but data on its level in general population and seasonal and diurnal dynamics are scarce. Though age differences in children have been reported, adults are regarded as a homogenous cohort (Mulhall, 2018), complicating differentiation between age-related decrease from late hypogonadism.

The aim of the study was to analyze testosterone age, seasonal and diurnal variability in male outpatients.

Materials and Methods. 10945 anonymized ambulatory male total testosterone tests performed in 2015–2021 at SIA “Centrālā laboratorija” (ARCHITECT i4000SR) were analyzed by IBM SPCC v.25.

Results. Testosterone was near zero till age 10 (mean 0.15 ng/mL, 5th–95th percentile 0.02–0.25 ng/mL); transition was observed at age 11–14 (2.48, 0.12–7.11 ng/mL), increase at 15–17 (5.23, 1.63–9.54), peak at 18–40 (7.45, 2.04–16.50), decrease at 41–55 (5.69, 1.44–10.70) and plateau after 55 (3.39, 0.13–8.82).

At age 0–10, 95th percentile was increased between 7:00 and 11:00 (Kruskal-Wallis $p = 0.011$) and in January–April ($p = 0.039$). At age 18–40, 95th percentile was lower in the morning ($p < 0.01$) and dropped in September–December ($p < 0.01$). Variation in other age groups were insignificant.

Applying manufacturer reference range 2.3–10.2 ng/mL, 27.70% adult tests were abnormal: 6% low and 9% high at age 18–40, 11% and 6% at 41–55, 41% and 2% at > 55 .

Conclusions. Though the studied population was not healthy, the cohort is sufficient for preliminary assumptions.

Adult testosterone norms are not applicable to children. The obtained 5th–95th pediatric percentiles coincide with published series (Cohen, 2020; Baum, 2020) and could be tentatively used as reference.

Testosterone decreases with age; at least 3 adult age groups should be separated: 18v40 (peak), 41–55 (decrease of upper norm) and > 55 (lower norm drops). This approach reduces the unreasonable 41% low results in elders and reclassifies half of the elevated results at 18–40.

Daytime and seasonal variations may be important for testing regimen and interpretation.

MENTAL HEALTH AND NEUROSCIENCE

ADMINISTRATION OF INTRAVENOUS IMMUNOGLOBULINS IN DEPARTMENT OF NEUROLOGY AT PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL IN 2021–2022

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Objectives. Intravenous immunoglobulin (IvIg) is a type of immunomodulating therapy used in various disease treatment, including autoimmune, infectious, and inflammatory conditions. The aim of this study was to analyse indications, efficacy, and side effects of IvIg therapy in Department of Neurology at Pauls Stradiņš Clinical University Hospital (PSCUH) in a period 2021–2022.

Materials and Methods. Retrospective analysis of patients who received IvIg in Department of Neurology at PSCUH from 01.01.2021.–31.12.2022. We analysed patient files and daily recordings, evaluating indications for IvIg treatment, clinical outcome, and experienced side-effects.

Results. Our study included 37 patients – 17 men (45.9%) and 20 women (54%). The mean age of patient was 57 ± 16 years. 29 patients (78%) received IvIg during acute hospitalization, 8 patients (21.6%) – during planned hospitalization. 10 patients (27%) received IvIg because of CNS disorders (autoimmune encephalitis (16.2%), myelitis (5.4%), acute disseminated encephalomyelitis 1 (2.7%), autoimmune encephalomyelitis (2.7%)), 3 patients (8.1%) received IvIg because of combined CNS and PNS disease (tick borne virus induced meningoradiculoneuritis (5.4%), subacute myelopolyradiculoneuritis (2.7%)), but 24 patients (64.8%) received IvIg for PNS disease (Myasthenia gravis (16.2%), Lambert-Eaton myasthenic syndrome (2.7%), Guillain – Barre syndrome (18.9%), chronic inflammatory demyelinating polyneuropathy (2.7%), multifocal motor neuropathy (2.7%), rapidly progressive demyelinating polyneuropathy (10.8%), myopathy (10.8%)). 2 patients received IvIg course repeatedly during 2021–2022, both had PNS diseases. Neurological symptoms improved in 28 patients (75.6%) after the IvIg therapy. 7 patients (19.0%) had no improvement, but 2 patients (5.4%) deteriorated despite IvIg therapy. Only 2 patients experienced IvIg-related side effects – headache (1) and fever (1).

Conclusions. IvIg proved to be effective for both CNS and PNS pathology – improvement of neurological symptoms was observed in 75.6% of patients. Nevertheless, 5.4% of patients had progression of disease despite IvIg therapy. Our experience showed good safety profile of IvIg with therapy-related complications in only 5.4% of patients.

ALCOHOL USE AMONG PATIENTS WITH OPIOID MAINTENANCE THERAPY

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Objectives. Aim of this study was to examine alcohol use among patients with opioid maintenance therapy. Clinical studies indicate that about a third of patients show increased alcohol consumption. One of the methods for screening unhealthy alcohol intake, defined as risky or hazardous consumption or any alcohol use disorder was AUDIT (Alcohol Use Disorders Identification Test).

Materials and Methods. The study was cross-sectional, quantitative and was conducted in Rīga Psychiatry and Narcology Centre Outpatient clinic. The study group was patients in methadone maintenance therapy. The patients were assessed with AUDIT, with a score below 8 suggesting low-risk consumption, from 8 to 14 as harmful alcohol consumption and a score above 15 indicating the likelihood of alcohol dependence. Socio-demographic data, medical and substance use characteristics, and data about concomitant infectious diseases was also collected.

Results. A total of 160 patients were assessed – 126 men (78.8%) and 34 women (21.2%) with median age 42.4 years. 38 patients were latvians (23.8%), 122 others (76.2%). First patient in therapy was from 1996. Average dose of methadone was 89.96 mg/day. 82.5% of patients had at least one of infectious diseases and from them 27.5% were both HIV and hepatitis C positive. 24.4% of patients were diagnosed with alcohol use disorder during program. After AUDIT 78.1% of patients had low-risk consumption, 11.9% – harmful use and 10% had risk of alcohol dependence.

Conclusions. The results of the study seem to indicate that alcohol use is lower than it was mentioned in clinical studies. In Outpatient clinic AUDIT is given only once a year and then they have a brief intervention to lower alcohol use problems if the score is above 8. Therefore AUDIT as a component of clinical policy should be incorporated with brief interventions to lower alcohol use among those patients on each visit.

ANXIETY AND DEPRESSION IN ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS (T1DM) AND THEIR PARENTS, AND ITS IMPACT ON METABOLIC COMPENSATION OF DIABETES

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Objectives.

1. To determine the symptoms of anxiety and depression in adolescents with type 1 diabetes mellitus and their parents;
2. To evaluate the relationship between parental anxiety, depression and metabolic control of their adolescents with T1DM.

Materials and Methods. In the quantitative cross-sectional study we determined the prevalence of anxiety and depression in adolescents with T1D and their parents (N = 502). The results were compared with the control group consisting of somatic healthy adolescents and their parents (N = 310). Anxiety symptoms were evaluated applying the Generalized Anxiety Disorder 7-item (GAD 7) scale. Depression symptoms were evaluated using the Patient Health Questionnaire 9 (PHQ 9) scale. 812 respondents were eligible for screening. Glycaemic control of patients was assessed using the last glycated haemoglobin (HbA1c) values. GLM mediation analysis was performed to determine the potential mediating effect of parents' anxiety and depression on the relationship between anxiety and depression of child on the level of HbA1c.

Results. Anxiety and depression symptoms were seen significantly more frequently ($p < 0.001$) in the study group than in the control group, both in the child and in the parent subgroups. A strong statistically significant positive correlation ($P < 0.001$) was observed between anxiety and depression severity and HbA1c – the main criterion for diabetes compensation, and it is fully mediated by parent GAD-7.

Conclusions.

1. Adolescents with Type 1 diabetes and their parents are more predisposed to anxiety and depression symptoms than somatic healthy children and their parents;
2. Anxiety and depression impair the metabolic control and prognosis of diabetes;
3. Glycated haemoglobin in adolescents with Type 1 diabetes is related to adolescents' mental health via parents' anxiety;
4. Further multiprofessional research and care is necessary for children with T1D and their families, in order to avoid the development of stress-related mental health disorders.

ANXIETY AND USE OF COPING STRATEGIES IN LATVIAN MEDICAL RESIDENTS DURING COVID-19 PANDEMIC

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Objectives. During the COVID-19 pandemic level of psychological stress has increased in general population, as well as in student and medical doctor population. Anxiety disorders are ranked as the sixth largest contributor to non-fatal health loss globally. The aim of study was to investigate anxiety symptoms and coping strategies in residents in Latvia and to evaluate connection to COVID-19 related factors.

Materials and Methods. Residents in Latvia were asked to complete self-reported online questionnaire, including questions about demographics, residency and COVID-19 pandemic, Generalized Anxiety Disorder 7-items and The Coping Orientation of Problem Experience inventory. Data was collected April through November 2022 and analysed using Mann-Whitney U-test and Spearman's Rank Correlation Coefficient.

Results. In study participated 142 medical residents, mean age 29.4 (SD = 4.5), 80.3% where female. Significant anxiety symptoms (GAD-7 ≥ 10) were reported by 28.2%. We found statistically significant connection between significant anxiety symptoms and active coping ($U = 1467.0$ $p = 0.008$), planning ($U = 1454.5$ $p = 0.007$), positive reinterpretation and growth ($U = 1323.5$ $p = 0.001$), focus on and venting of emotions ($U = 1294.0$ $p = 0.001$), behavioural disengagement ($U = 1128.0$ $p = 0.000$), mental disengagement ($U = 1480.5$ $p = 0.010$) and alcohol-drug disengagement ($U = 1606.5$ $p = 0.031$). Correlation with anxiety score was statistically significant and negative for positive reinterpretation and growth ($r = -0.322$, $p = 0.000$), active coping ($r = -0.256$, $p = 0.002$) and planning ($r = -0.241$, $p = 0.004$). Correlation with anxiety score was statistically significant and positive for behavioural disengagement ($r = 0.429$, $p = 0.000$), focus on and venting of emotions ($r = 0.401$, $p = 0.000$), alcohol-drug disengagement ($r = 0.300$, $p = 0.000$) and mental disengagement ($r = 0.195$, $p = 0.020$). Data shows that most of participants as a coping strategy preferred (COPE ≥ 8) planning (11.79, SD = 2.62), active coping (11.71, SD = 2.26), positive reinterpretation and growth (11.67, SD = 2.21) and mental disengagement (10.16 SD = 1.86).

Conclusions. Results show, that third of participants reported significant anxiety symptoms. Most of coping strategies were connected with significant anxiety symptoms and some showed medium correlation with anxiety score. Residents mostly prefer to use coping strategies that negatively correlated with anxiety.

ARTERIAL ISCHEMIC STROKE IN CHILDHOOD: CLINICAL EXPERIENCE IN LATVIA

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Objectives. Arterial ischemic stroke (AIS) is an important cause of disability and mortality during childhood with reported incidence of 1-2 cases per 100 000 children a year. Our objectives were to assess occurrence, diagnostics, clinical features, possible etiologies and used treatment of arterial ischemic stroke among Latvian children in the age group from 28 days to 18 years.

Materials and Methods. Retrospective study was conducted by analyzing medical record data from patients who were treated in Children's Clinical University Hospital (CCUH) of Latvia in a time period from January 2012 to December 2022 with diagnosed AIS. Data was analyzed using IBM SPSS.

Results. In total, 39 cases were included (3.5 ± 1.7 SD cases per year), from whom 23.1% (N = 9) were intrahospital events, 64.1% (N = 25) were primarily admitted to CCUH, while 33.3% (N = 13) were transferred to CCUH from regional hospitals, but 1 patient from abroad. The mean patient age at onset of stroke was 97.6 ± 58.2 SD months, 56.4% (N = 22) were men and 43.6% (N = 17) women. The most frequent first symptoms were hemiparesis 48.7% (N = 19) or seizure 20.5% (N = 8). Among cases occurring outside the hospital (76.9%, N = 30), the majority (73.3%, N = 22) of patients were admitted to hospital on the same day of symptom onset. Brain magnetic resonance imagining was the most used first imaging method (53.8%, N = 21). Only 2 patients (5.1%) have been treated with intravenous thrombolysis and no thrombectomies have been performed. Most frequent presumed etiologies were congenital heart disease 28.2% (N = 11) and cerebral arteriopathies 23.1% (N = 9). Median length of hospital stay was 17(IQR = 16) days.

Conclusions. AIS has a regular occurrence among the Latvian children population, but only few patients have received acute treatment. Although childhood stroke has age-specific etiologies and clinical features, however, like for adults, it demands proper and fast diagnostics and treatment to mitigate long term sequelae. Development of a nationwide algorithm for diagnostics and treatment of arterial ischemic stroke in childhood could possibly help to reach this goal.

ASSOCIATION BETWEEN PATIENT WITH CHRONIC DISEASES AND DEPRESSION AND ANXIETY IN GENERAL PRACTICE

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Objectives. Some research show that chronic diseases and depression and anxiety comorbidity have higher mortality risk. The aim of the study was to evaluate the depression and anxiety level in patients with chronic disease. As well as to find out a correlation between number of medications and depression and anxiety level.

Materials and Methods. This was a prospective study, carried out in a general practice and involved 116 adult respondents. Respondents were invited to complete a Generalized Anxiety Disorder Assessment (GAD-7), Patient Depression Questionnaire (PHQ-9) followed by a questions about medications and chronic diseases. Statistical analysis was performed with SPSS 22.0. We used The Shapiro-Wilk test, the Mann-Whitney test, Chi-square and Cramer's v test.

Results. In total we included 116 respondents, 20.7% men and 79.3% women. The mean age of the group was 40.1, age group 23-72 years. Of all respondents 37.9% have chronic disease – group1 and others were in group 2. From group 1, 72.7% took medication daily. Between all participants depression level were: no depression 49.1%, mild 25%, moderate 18.1%, moderately severe 5.2%, severe 2.6%. Anxiety levels were: no anxiety 55.2%, mild 28.4%, moderate 12.9%, severe 3.4%. There was not significant difference in depression ($p = 0.5$) and anxiety level ($p = 0.7$) between both groups. Also, there was not significant difference in depression ($p = 0.5$) and anxiety level ($p = 0.3$) between respondents who take medication daily and not. Correlation coefficient between number of medications and depression and anxiety score were $r = 0.06$ and $r = 0.03$ correspondingly.

Conclusions. in our research we found that patients with chronic disease have no higher depression and anxiety level compared with patient without chronic disease, and number of medications does not affect depression and anxiety level.

ASSOCIATION OF BRAIN MRI VOLUMETRY RESULTS WITH CHANGES IN EDSS AMONG PATIENTS WITH MULTIPLE SCLEROSIS DURING A 5-YEAR FOLLOW-UP

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Objectives. To investigate the relation between brain volumetry results and EDSS among patients with multiple sclerosis in relation to provided treatment during a 5-year period.

Materials and Methods. In total, 66 consecutive patients with confirmed MS were enrolled in a retrospective cohort study, predominantly females, 62.1% (n = 41); 92.4% (n = 61) relapsing-remitting MS, 7.6% (n = 5) secondary-progressive (SP) MS patients. The median age was 45 (interquartile range (IQR) 37–49). All patients were evaluated clinically using EDSS and radiologically using FreeSurfer© 7.2.0 during a 5-year follow-up.

Results. Baseline EDSS ranged between 1 and 6 with a median of 1.5 (IQR 1.5–2.0), after 5 years EDSS went between 1 and 7, median of 3.0 (IQR 2.4–3.6), $p < 0.05$. During a 5-year period, EDSS increased in 86.4% (n = 47) patients with a significant increase among SPMS patients (median 7.0; IQR 5.0–7.0), compared with RRMS patients (median 2.5; IQR 2.0–3.3), $p < 0.001$. Significantly lower volumetry results were obtained in different brain areas including cortical and total grey and white matter, $p < 0.05$, with the most significant decrease in the left thalamus ($p = 0.001$) and right thalamus, $p < 0.001$. Most patients received specific therapy 97.0% (n = 64). All patient EDSS increased, the most significant rise noted in patients receiving 1st and 2nd line therapy, $p < 0.001$. In our study population, provided treatment did not influence volumetry results during a 5-year follow-up, $p > 0.05$.

Conclusions. Brain magnetic resonance volumetry results are significantly associated with disability progression. In our study, the most significant decrease was noted in the left and right thalamus. Therapy did not influence volumetry changes. Further studies with larger patient groups are warranted to determine the association between brain volume changes and MS patient disability progression in relation to the provided treatment.

ASSOCIATION OF DEPRESSIVE AND ANXIETY SYMPTOMS WITH SKIN PICKING BEHAVIOUR IN PATIENTS WITH ACNE VULGARIS AND ROSACEA

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Objectives. Skin picking disorder is triggered by negative emotions or skin conditions like acne. The aim of the study was to determine the prevalence of skin picking behavior in an outpatient population of acne and rosacea patients and associated symptoms of depression and anxiety.

Materials and Methods. A study was conducted during the period from October 2022 to January 2023 in Clinical Centre of Skin and Sexually Transmitted Diseases, Riga 1st Hospital outpatient department. All respondents at the onset of study were adults and had acne vulgaris or papulopustular form of rosacea. Evaluations included self-report questionnaires for skin picking (Skin picking scale – revised (SPC-R)), depression (Patient Health Questionnaire–9 (PHQ-9)), anxiety (General Anxiety Disorder–7 (GAD-7)) and social demographic data.

Results. The final study sample included 30 respondents: 10 males (33.3%) and 20 females (66.7%), mean age was 31.6 (SD 11.03). The point prevalence of skin picking among the patients was 50.0% (95% CI 31.3–68.7). Clinically significant depressive symptoms were diagnosed in 23.3% (n = 7) respondents (95% CI 9.9–42.3), but without significant difference among respondents with and without skin picking (p = 0.19). In 56.7% (n = 17) of respondents (CI 37.4–74.5%) at least mild clinically relevant anxiety were found, and 13.3% (n = 4) suffered from the severe anxiety. Among all skin picking sufferers 66.7% (n = 10/15) had an anxiety, but without significant difference among respondents with and without skin picking (p = 0.23). Negligible degree of positive correlation (r = +0.06) was found between the SPS-R and GAD-7 score (p = 0.76); and between SPS-R and PHQ-9 results (r = +0.09).

Conclusions. Study indicates that skin picking behavior occurs in 15 (50%) of acne and rosacea patients and two thirds of them suffers from anxiety. It may worsen underlying skin condition, cause scars and impact mental health. The further research is needed that includes larger sample sizes to obtain more reliable results with greater precision and power.

ATYPICAL PRESENTATION OF GUILLAIN–BARRE SYNDROME

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Objectives. Guillain–Barre syndrome (GBS) is an acute immune-mediated inflammatory demyelinating polyneuropathy characterized by symmetrical limb weakness and areflexia. GBS can have different clinical manifestations; hence, the initial symptoms can vary. Here, we describe a case of GBS with severe autonomic dysfunction.

A 13-year-old boy had complaints about worsening leg weakness and pain in lower limbs. He fell riding a bicycle and after that was admitted to hospital. The neurological exam revealed asymmetric tetraparesis, areflexia, bilateral peripheral facial palsy, bilateral ophthalmoplegia. Based on the findings from a neurological examination, MRI, cerebrospinal fluid analysis, and nerve conduction study, a diagnosis of GBS was made. Patient was started on intravenous immunoglobulin (0.4 g/kg, 5 days). Suddenly his condition worsened, on his skin we saw red macules that would appear and disappear in few minutes, as well as hypertension and tachycardia. At first it was thought to be an allergic reaction to IVIG. But after dermatologists' consultation and repeated episodes after the stop of therapy, it was concluded to be autonomic dysfunction, later bladder dysfunction manifested. He received multidisciplinary care during the stay in the pediatric neurology department.

After treatment with IVIG patients neurological condition improved. He now continues rehabilitation.

In patients with slow progression of symptoms, the diagnosis of GBS can be delayed. Some features of GBS can mimic other diagnosis that should be considered to not discontinue treatment.

BANNWARTH SYNDROME – RARE LYME DISEASE MANIFESTATION IN CHILDREN

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Objectives. Lyme disease is a tick-borne illness primarily caused by *B.Burgdorferi*. In Europe, neuroborreliosis occurs in up to 15% of infected patients. Bannwarth syndrome is a clinical manifestation of neuroborreliosis with painful radiculopathy, facial nerve palsy and lymphocytic pleocytosis in cerebrospinal fluid(CSF). It is very rare among children with only a few described cases published in literature.

A 12 years old male patient was admitted to the hospital with lower back pain with radiation to the right groin. Symptomatic treatment with analgesics was administered for three days, after clinical improvement, the patient was discharged from hospital. After 12 days, facial asymmetry appeared and the patient returned back to the hospital.

On examination, the patient had subfebrile body temperature, facial nerve palsy(FNP) on the right side, weakened deep tendon reflexes in both legs and lower back pain with radiation to L1-L2 spinal root distribution on the right side.

CSF analysis showed pleocytosis(376 cells/uL) with lymphocytic predominance and protein level of 3.1 g/L. *B.burgdorferi* IgG antibodies(Ab) were found in CSF and serum, but *B.burgdorferi* DNA was detected in CSF. Ab index of CSF:serum was not performed due to lack of CSF sample. Magnetic resonance imaging showed contrast enhancement of the right facial nerve and polyradiculoneuritis at the level of cauda equina.

Treatment with intravenous ceftriaxone was initiated. On the second day of treatment, FNP appeared on the left side. After 21 days of treatment, gradual muscle strength improvement in face was seen, lower back pain was absent and body temperature was normal.

We presented a pediatric patient with Bannwarth syndrome. Case showed that rather nonspecific onset of symptoms led to delayed diagnostics. It may be possible that because of that Bannwarth syndrome is underdiagnosed among children worldwide. In our case, even after delayed diagnostics, appropriate treatment led to a favorable outcome.

BELIEF IN CONSPIRACY THEORIES AMONG LATVIAN STUDENT GROUPS DEPENDING ON THEIR STUDIES DURING THE COVID-19 STATE OF EMERGENCY

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Objectives. There is an evidence that among students rates in beliefs in conspiracy are high, which has a significant impact on behaviour related to depression and anxiety. However, there is limited data about student beliefs in Latvia. This study aims to investigate the difference in beliefs in conspiracy theories among different study groups of Latvian students during the second COVID-19 outbreak.

Materials and Methods. This was a cross-sectional international study where university and college students were asked to fill the self-report online questionnaire developed as a part of an international study during the COVID-19 state of emergency. Data were analyzed using Chi-square test.

Results. The study included 1047 students. Students were classified into three groups depending on their studies. Group A 36.90% (N = 386) included health and biological sciences, group B 31.30% (N = 328) included technical sciences and group C 31.80% (N = 333) – arts, literature, education, and related sciences. Out of all respondents who believed very much or much that COVID-19 appeared accidentally from human contact with animals, and it was something that generally happens 51.80% (N = 177) was group A. Meanwhile, 41.20% (N = 98) of all who believed very much or much that COVID-19 has much lower mortality rate but there is misinformation and terror-inducing propaganda was group C. Almost half of the respondents who believed very much or much that vaccines in general are dangerous and should be avoided were from group C (48.60%, N = 35). Additionally, 39.50% (N = 102) was group C who believed much or very much that many important pieces of information are deliberately hidden from the public for reasons of interest.

Conclusions. The study showed that overall group C students believe much often in conspiracy theories. This study could help to evolve a plan in future for dealing with psychological support for students population.

BELIEFS IN CONSPIRACY THEORIES AND SELF-REPORTED CHANGES IN ANXIETY AND DEPRESSION IN THE SAMPLE OF LATVIAN STUDENTS DURING THE COVID-19 STATE OF EMERGENCY

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Objectives. The aim of the study was to determine the association of believes in conspiracy theories and changes in anxiety and depressive symptoms in Latvian students during the COVID-19 emergency state.

Materials and Methods. A study was a part of a large international project. During the second COVID-19 outbreak students from Latvia were asked to fill out the self-reported online questionnaire. Anxiety was assessed by the State-Trait Anxiety Inventory-Y1 and depression was assessed using Center for Epidemiologic Studies Depression Scale. Data were analyzed using SPSS Statistics (Pearson's chi-square test and binomial logistic regression).

Results. The survey completed 1047 Latvian students. Certain believes were associated with self-reported worsening in relation to the appearance of depression: believe that the recommended COVID-19 safety measures are an attempt to restrict human rights and lead to some kind of dictatorship a little (OR = 2.41); believe that COVID-19 has much lower mortality rate but there is misinformation and terror-inducing propaganda (OR = 1.85); believe that COVID-19 outbreak is a deliberate creation of the world's powerful leaders (OR = 2.17); and a believe that a small, secret group of people is responsible for taking all the important decisions, such as starting wars (OR = 2.15). Believe that the recommended COVID-19 safety measures are an attempt to restrict human rights and lead to some kind of dictatorship increased odds to worsening of depression and anxiety (OR = 1.72 and OR = 2.41, respectively). Respondents who tend to believe that earth is flat rather than spherical a little bit or maybe had 2.30 increased odds of having worse or much worse anxiety.

Conclusions. Believes in conspiracy theories are associated to the increase of anxiety and depressive symptoms. The study's findings can help to develop future strategies to management of psychological support for different groups in Latvian population.

BURNOUT AND SYMPTOMS OF DEPRESSION DURING COVID-19 PANDEMIC IN LATVIAN MEDICAL RESIDENTS

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Objectives. Burnout and depression are major reasons why medical specialists are leaving their jobs. Medical residents are one of the most vulnerable groups, due to the lack of experience and insufficient supporting systems. Aim of this study was to investigate depression symptoms and burnout in residents of Latvia and evaluate their connection to COVID-19 related factors.

Materials and Methods. Residents from Latvia were asked to complete an online self-report questionnaire, which included demographic data, questions about residency and COVID-19, Patient Health Questionnaire-9, Maslach burnout inventory. Data were collected during april-november 2022. Descriptive statistics and non-parametric statistical analysis method was used.

Results. 142 residents participated in the study, 80.3% (N = 114) were females. Mean age was 29.4 years (SD = 4.5). More than a half (57.7%, N = 82) reported high emotional exhaustion, 43.7% (N = 62) high depersonalisation and 62% (N = 88) low personal accomplishment rate; 59.2% (N = 84) noted an increase in the amount of work. Significant depression symptoms (PHQ \geq 10 points) were reported by 33.8% (N = 48). Clinical depression symptoms were statistically significantly connected with all three burnout scales: emotional exhaustion (U = 905.0, p = 0.000), depersonalisation (U = 1179.5 p = 0.000) and low personal accomplishment rate (U = 1689.5 p = 0.005). Data showed statistically significant association between depression symptoms and decreased subjective satisfaction with life (U = 1072.5 p = 0.000), decreased subjective health state evaluation (U = 1274.5 p = 0.000), subjective negative impact of pandemic on mental health (U = 1839.5 p = 0.043), increased amount of work (U = 1793.0, p = 0.021).

Conclusions. One third of participants reported clinically significant depression symptoms, and more than a half of residents reported high burnout rate. Some of the COVID-19 pandemic related factors were significantly connected with depression symptoms. Consistent and more available supporting systems for medical residents are needed.

CASE OF ATYPICAL MUNCHAUSEN SYNDROME

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Objectives. Munchausen syndrome is the most dramatic and exasperating form of factitious disorders. Criteria: 1. Falsification of psychological or physical signs or symptoms, induction of disease or injury associated with identified deception.; 2. The individual presents to others as injured, ill, or impaired.; 3. The deceptive behaviour is apparent even in the absence of external incentives.; 4. The behaviour is not better explained by another mental disorder.

This case report will show how the Munchausen syndrome can present and how we can avoid overlooking such cases. This patient is currently being treated under direct psychiatrists' surveillance.

Materials and Methods. In this case study we document an interesting encounter with a young female patient, who presented in hospital with severe anaemia. The patient underwent a long path from hospital to hospital with different diagnoses and treatment strategies until she saw a psychiatrist and was diagnosed and treated as Munchausen syndrome. This case report will show how the Munchausen syndrome can present and how we can avoid overlooking such cases.

The patient presented with symptoms of severe anaemia.

It was learned that the patient was admitted to another hospital with similar complaints previously. She was examined in haematology department.

Laboratory tests were performed, and they showed an interesting finding of remarkably high INR of 7.

Results. The patient finally revealed that she is using blood thinners such as warfarin and by preforming cuts on her thighs causing leakage of large amounts of blood, that leads to loss of consciousness.

After exhaustive evaluation and based on the psychiatrist's evaluation of the patient, we approved the diagnosis of a factitious disorder.

Conclusions. Munchausen's syndrome often begins in early adulthood or adolescence and may begin after a hospitalization or medical illness. These patients understand medical terminology very well and usually are fully aware of the damage they are inflicting on themselves.

CATATONIC SCHIZOPHRENIA: SOCIODEMOGRAPHIC, CLINICAL CHARACTERISTICS, AND PREDISPOSING FACTORS FOR THE FIRST EPISODE

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Objectives. The concept of catatonia has changed in the late 20th century, although catatonic schizophrenia (CS) has received less attention in recent decades. The aim of this study was to evaluate the clinical characteristics, course and predisposing factors in the acute phase of CS.

Materials and Methods. This retrospective cross-sectional study was conducted at the Riga Psychiatry and Narcology Center in 2021. The study included inpatients with a primary diagnosis of CS, aged 18 to 65 years. The first and last medical records of hospitalization were analysed in a time frame of 2012–2021.

Results. A total of 24 medical records were examined, (67% of men, 33% of women). The majority of patients had the onset of the disease in the age group of 26–35 years (29%). Prodromal symptoms were observed in 32% of patients, the most common symptom was social isolation (100%). The stupor and numbness were observed in 79.2% of conditions at the first exacerbation of the CS, while motor agitation (70.6%) dominated during the last hospitalisations ($p = 0.002$). In 58.3% of patients, a use of dopamine blockers was detected, in 50% – long-term use of anticholinergic drugs with recent withdrawal or dose reduction, in 37.5% – an increased level of psycho-emotional stress and in 33.3% adverse heredity as a risk factor for the development of CS.

Conclusions. The clinical profile of the first onset inpatient with CS were a man aged 26–35 years, with catatonic stupor, but the symptoms of catatonic agitation prevail in the dynamics of the disease. CS showed associations with use of dopamine blockers, long-term use of anticholinergic drugs with recent withdrawal or dose reduction, adverse heredity, and increased levels of psycho-emotional stress during the life. It is important to emphasize the role of preventive measures that could improve the early detection and planning the care strategies of patients with CS.

CHALLENGES IN MEASURING LONG-TERM PHYSICAL ACTIVITY: DEVELOPMENT OF THE MOTOR RESERVE QUESTIONNAIRE

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Objectives. The aim was to develop a survey that provides information on many physical activities during life and to systematically collect the respondent's subjective assessment of the physical activities performed during his lifetime.

Materials and Methods. The development of the Motor Reserve questionnaire (MRA) survey was carried out in seven stages, each of the stages describes the process of developing the survey. The MRA is structured in two parts. The first part is completed independently in writing before the interview, and the second part is completed as an interview with the interviewer. The information provided by the participant is entered in parallel in the MRA application. After receiving the information, the participant's data was compared with the fitness bracelet data for a specific time period. For the data comparison, 22 women, aged 70–85 years, participated in the study.

Results. MRA allows retrospective measurement of physical activity over a lifetime. The survey is based on previously developed instruments Historical Leisure Activity Questionnaire (HLAQ, Kriska et al., 1990), The Lifetime Total Physical Activity Questionnaire (LTPAQ, Friedenreich et al., 1998) and Short Retrospective Questionnaire For Physical Activity, Schmidt & SRQPA (SRQPA). Steindorf, 2006), but depending on the detail of the obtained data (Ulmane et al., 2019).

An electronic data entry application was created for data entry, with the help of which the interviewer can enter the sub-activities named by the participant and the time devoted to them in each of the dimensions of physical activity. The app automatically calculates energy consumption and metabolic equivalent amount for the specific activity.

Conclusions. The survey can be used to obtain the respondent's self-reported information about the time devoted to physical activities of various dimensions during life. And with the electronic data entry application, calculate the energy consumption devoted to activities of various dimensions during life.

CHRONIC KIDNEY DISEASE AND CEREBROVASCULAR PATHOLOGY – INCIDENCE AND FUNCTIONAL OUTCOME IN RIGA EAST UNIVERSITY HOSPITAL

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Objectives. The aim of this study was to investigate the incidence of cerebrovascular pathology in patients with chronic kidney disease and its effect on functional outcomes.

Materials and Methods. In a retrospective cross-sectional study (2018–2020) was analyzed acute hemorrhagic and ischemic stroke patient medical records with concomitant chronic kidney disease who received treatment in Riga East University Hospital Stroke Unit. Data was analysed using IBM SPSS 26.0. Kruskal Wallis, Man Whitney U Test and Spearman's rank correlation coefficient were used.

Results. Final sample consisted of 305 acute cerebrovascular pathology patients (56.4% females). Overall, 57.3% of stroke patients had second stage chronic kidney disease with average serum creatinine levels 104.3 mmol/L (± 32.8).

The functional outcome of the stroke depended on the stage of chronic kidney disease. There was statistically significant nonlinear correlation between glomerular filtration rate and NIHSS score on admission (Rho -0.194, $p = 0.016$), glomerular filtration rate and NIHSS score on discharge (Rho -0.186, $p = 0.020$) as well as glomerular filtration rate and mRS on admission (Rho -0.237, $p = 0.003$) and discharge (Rho -0.224, $p = 0.05$). Mean NIHSS score of ischemic stroke patients on admission was 8.3 ± 5.9 , on discharge – 6.5 ± 5.8 . In hemorrhagic stroke patients group mean NIHSS score on admission was 9.5 ± 7.3 , on discharge – 7.1 ± 6.9 . On average 34% of ischemic stroke patients had mRS score 5 on admission, while in hemorrhagic stroke patient's group – 41%. There was not found a statistical difference between glomerular filtration rate and thrombolysed/non-thrombolysed patients groups (Mann Whitney U Test = 1457, $p = 0.794$).

Conclusions. Chronic kidney disease is an important predictor of the severity and functional outcome of a stroke, furthermore the early management and prevention of complications should be a top priority in the prophylaxis of this cerebrovascular pathology.

CLINICAL CHARACTERISTICS OF RESTRAINED PATIENTS IN THE CHILDREN'S CLINICAL UNIVERSITY HOSPITAL CHILD PSYCHIATRY CLINIC INPATIENT WARD IN THE YEARS 2013 TO 2022

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Objectives. To evaluate the clinical characteristics (age, gender, clinical diagnoses) of the patients that have been subjected to coercive measures (seclusion or restraint) while receiving inpatient psychiatric care in the Clinical University Hospital between 2013 and 2022.

Materials and Methods. A retrospective study was conducted using Children's Clinical University Hospital inner documentation and data from archives that included clinical patient data, restraint, and seclusion protocols. IBM SPSS v.26 was used for statistical analysis.

Results. The total number of inpatients in the child psychiatry unit who were restrained and secluded between 2013 and 2022 was 79 or 1.6% of all 4819 of inpatients in the child psychiatry unit. 53 (67.1%) of the patients were male. The average age of the patients was 13.1 years (SD = 2.57), the youngest patient being 7 y.o., and the oldest – 17 y.o. The average length of hospital stay of coerced patients was 18.5 (SD = 23.6) hospital days. The average number of instances of seclusion or restraint per patient was 3.0 (SD = 4.38). The majority of patients (63.3%) were coerced only once during their hospital stay, and 27.8% were secluded or restrained 3 and more times. The maximal number of instances of coercion per patient was 30. The most frequent clinical diagnosis groups among restrained patients were intellectual disability (34.2%, N = 27), conduct disorder (31.6%, N = 25), substance use-related disorders (19.0%, N = 15), schizophrenia (12.7%, N = 10) and organic mental disorders (11.4%, N = 9) or a combination of thereof.

Conclusions. The typical patient at risk of requiring coercive measures during inpatient psychiatric treatment is an adolescent boy with a severe neurodevelopmental disorder (e.g. intellectual disability, schizophrenia) or externalizing disorder (e.g. conduct disorder, substance use-related disorder)

CLINICAL UTILITY OF THE SELF-REPORT STRENGTHS AND DIFFICULTIES QUESTIONNAIRE (SDQ) IN CHILD AND ADOLESCENT PSYCHIATRIC OUTPATIENT SETTING

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Objectives. The aim of this study was to examine the prevalence of adolescent self-reported internalising and externalising difficulties in a clinical sample of adolescents seeking help in an outpatient psychiatric clinic and examine the clinical utility of the SDQ as a screening tool for predicting clinically determined mental health diagnoses.

Materials and Methods. The study was conducted at the Children's Clinical University Hospital in Riga. The study group comprised 11–17 y.o. patients who received outpatient psychiatry care. SDQ self-report was used. It consists of emotional and peer problem subscales (combined – internalising difficulties), conduct and hyperactivity subscales (combined – externalising difficulties) and total difficulties scale. According to ICD-10, internalising disorders in this study were F3x, F4x, F50, F51, F93, externalising disorders included F1x, F90, F91, F92. When analysing the score, the Latvian community sample cut-off scores were used, 80th percentile was used for defining “high” score.

Results. 207 valid adolescent reports were analysed. Adolescents were mostly female (60.9%, N = 126), mean age 13.9 years. 58.9% had an internalising diagnosis, 23.2% an externalising diagnosis. In self-reports, 41.5% of adolescents reported high scores in internalising difficulties, and 27.1% reported high scores in externalising difficulties scale. High scores in emotional ($r = 0.29$, $p < 0.0001$), internalising ($r = 0.29$, $p < 0.0001$) and total difficulties ($r = 0.21$, $p = 0.004$) correlated positively with an internalising diagnosis, with sensitivity 50–66% and specificity 64–73%. A high score in the conduct subscale ($r = 0.22$, $p = 0.002$) correlated positively with an externalising diagnosis, with a sensitivity of 32% and a specificity 88%.

Conclusions. Emotional, internalising, and total difficulty scales showed a correlation with internalising clinical diagnoses, and conduct scale showed a correlation to externalising clinical diagnoses. Correlations were weak, and scale specificity was low. For the Latvian adolescent population, self-report SDQ may be better used to screen for internalising difficulties, and overall, both parent and adolescent reports should be used for more precise screening results.

COGNITIVE IMPAIRMENT BIOMARKERS IN MULTIPLE SCLEROSIS PATIENTS

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Objectives. Multiple sclerosis (MS) is a chronic, immune-mediated, inflammatory, and neurodegenerative disease of the central nervous system. Cognitive impairment is found in about half of MS patients. The Symbol Digit Modalities Test (SDMT) is a sensitive measure of impaired cognition in people with MS and serum neurofilament light chain (sNFL) is a biomarker of neuronal damage.

Materials and Methods. In our study, we analyzed 20 participants with relapsing-remitting MS (RRMS). All patients underwent 3T magnetic resonance imaging (MRI), sNFL, SDMT, and EDSS (Expanded Disability Status Scale). In the MRI brain volume and the quantitative measures of several structures were determined by using Freesurfer 7.2 software. Serum NFL concentration was detected by Single molecule array (Simoa) technology. The diagnosis of MS was made by McDonald's criteria (2017), the neurological examination was based on the EDSS, and cognitive impairment was detected by SDMT.

Results. In total there were 20 RRMS patients, 11 female, and 9 men. Average age 35.2 [25; 48] years, EDSS 2.00 [1.0; 5], sNFL 5.95 ng/L [2.6 ng/L; 21.3 ng/L], and SDMT 83.1 [74.4; 89.1]. We did not find correlation between sNFL and SDMT or EDSS. Likewise, we did not find correlation between SDMT and EDSS but there was tendency to negative relationship ($p = 0.06$). We did not find correlation between sNFL and tested part of brain volume. But we found tendency to positive correlation between SDMT and left thalamus ($p = 0.062$), left amygdala ($p = 0.06$), and subcortical gray matter volume ($p = 0.06$). Positive, medium, and statistically significant correlation was found between SDMT and left globus pallidum ($p = 0.01$), right thalamus ($p = 0.013$), and right globus pallidum ($p = 0.012$).

Conclusions. Our study found that there are few brain atrophy measurements that are associated with cognitive impairment in MS patients. But more research is needed with a larger cohort to determine good combination of biomarkers to detect cognitive impairment in RRMS patients.

CORRELATION BETWEEN SELF-ESTEEM AND ROMANTIC RELATIONSHIP SATISFACTION AMONG GENDERS OF HEALTHCARE WORKERS IN LATVIA

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Objectives. Health care workers (HCW) with higher depression and anxiety rates had lower self-esteem and higher dissatisfaction in romantic relationships. The aim of the study is to assess a correlation between self-esteem and romantic relationship satisfaction among genders of health care workers (HCW) in Latvia.

Materials and Methods. A quantitative cross-sectional study in the population of HCW in Latvia was made during April-June 2020. 844 HCW participated in the study. Self-esteem was assessed using the Rosenberg Self-Esteem Scale. Participants were asked about the family relationship status-married, unmarried with a partner, single-and feeling of satisfaction in it. Data was analysed using SPSS using Pearson's correlation coefficient.

Results. Out of 844 HCW, 710 (84.1%) were women. Age median for all participants - 40 (IQR 29-54). Rosenberg's self-esteem test median- 32 (IQR 28-36). No statistically significant correlation was found between self-esteem and relationship status among all participants ($p = 0.138$); among women ($p = 0.495$); among men ($p = 0.054$). Among all participants statistically significant, negative, very weak correlations were found between self-esteem and romantic relationship dissatisfaction ($RS = -0.196$; $p < 0.001$). Among women of married group, a statistically significant, negative, very weak correlation was found between self-esteem and marriage dissatisfaction ($RS = -0.138$; $p = 0.019$). Among women of unmarried group with a partner a statistically significant, negative, weak correlation was found between self-esteem and relationship dissatisfaction ($RS = -0.383$; $p < 0.001$). In single women participant group, a statistically significant, negative, very weak correlation was found between self-esteem and being single ($RS = -0.185$; $p = 0.022$). Among men, no statistically significant correlation was found between self-esteem and relationship dissatisfaction ($p = 0.420$; $p = 0.216$; $p = 0.830$).

Conclusions. Lower self-esteem correlates with higher dissatisfaction in romantic relationships among all participants. Difference between genders was found – women with lower self-esteem are more frequently dissatisfied in romantic relationships, however this was not found among men. Among men, there is tendency that self-esteem could be associated with relationship status, however that should be further studied in larger population.

CORRELATION OF CHILDHOOD MALTREATMENT EXPERIENCE WITH DEPRESSION AND ANXIETY AMONG LATVIAN ADULTS

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Objectives. According to WHO statistics 2020 each year one billion children worldwide suffer some form of violence, which many studies found is the one of the risk factors of developing depression and anxiety in adult age, whose prevalence increased by 25% last years (WHO, (2020)). Depression and anxiety can cause different psychological and physical problems that may seriously impact patients health and life quality. The aim is to identify the correlation between childhood abuse experience and prevalence of depression and anxiety.

Materials and Methods. In this cross-sectional study, Latvian adults (18–64 years) were asked to fill the questionnaire electronically. Questionnaire consisted of several self-assessment tools, including: Adverse childhood experiences scale (ACE-10), Hospital Anxiety and Depression Scale (HADS). Descriptive statistics were done by using Microsoft Excel and IBM SPSS Statistics software.

Results. There were 345 adults (85.5% female and 14.5% male) who completed the questionnaire. The survey results reported that (75.5%) had at least one point from ACEs, (44.9%) had mild or clinically significant anxiety and (29.6%) depression signs. Most prevalent form of child maltreatment was emotional abuse (46.4%) and emotional neglect (39.9%). There was found a moderate association between childhood adverse experience and HADS point count ($p = 0.384$), precise - anxiety ($p = 0.372$) and depression ($p = 0.308$). The strongest correlation was found between physical neglect and anxiety ($p = 0.459$), emotional neglect and anxiety ($p = 0.306$).

Conclusions. There was moderate correlation found between adverse childhood experiences and HADS. The emotional neglect was the second most popular abuse type and has moderate association with anxiety.

CURRENT APPROACH TO ALZHEIMER'S DISEASE IN RADIOLOGY AND OTHER NEURODEGENERATIVE DISEASES AND IMPORTANCE OF RADIOLOGY IN CLINICAL TRIALS OF AD DRUGS

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Objectives. Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by memory loss, cognitive decline, and functional impairment. Other neurodegenerative diseases, such as Parkinson's disease and Huntington's disease, also have a significant impact on quality of life and longevity.

In recent years radiology has moved a step forward to diagnose and monitor the progression of neurodegenerative diseases and assess the efficiency of drug trials. Radiology also plays a crucial part in monitoring the possible negative side effects of new drugs.

As such, the importance of radiology and its ability to detect even subtle changes in the brain or brain pathophysiology cannot be understated.

Materials and Methods. We reviewed several studies examining the use of imaging biomarkers for the early detection of AD and predicting its progression.

Additionally, we evaluated recent clinical trials utilizing MRI imaging to assess the efficacy of Alzheimer's drugs and the most common side effects.

Results. Nowadays, it is important to acknowledge and know about tools and possibilities in radiology to identify, monitor, and evaluate therapy results.

Through its wide range of applications, radiological imaging has become a valuable tool for detecting subtle brain changes associated with AD or determining changes following treatment intervention. In addition, radiologic data can provide reliable biomarkers useful for tracking disease progression or predicting therapeutic responses over time with greater accuracy than other methods such as cognitive tests or laboratory tests alone.

Conclusions. Radiology is playing an increasingly important role in the diagnosis and management of neurodegenerative disorders such as AD or Parkinson's Disease.

Imaging biomarkers are being developed for early detection or prediction of disease progression over time. Furthermore, imaging has been increasingly utilized in assessing drug efficacy in clinical trials for Alzheimer's drugs.

Therefore, clinicians must remain updated on the latest developments in order to provide optimal care for patients with neurodegenerative disorders.

DIAGNOSTIC DIFFICULTIES IN IMMUNOSUPPRESSED PATIENT WITH SUSPECTED PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA: CASE REPORT

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Objectives. Keywords. Primary central nervous system lymphoma; HIV.

Introduction. Primary central nervous system lymphoma (PCNSL) is a rare subtype of non-Hodgkin extranodal lymphoma, accounting for ~3% of all brain tumours. It can involve the brain, eyes, leptomeninges and spinal cord without evidence of it outside the central nervous system. Diagnostics can be very difficult, because there are no specific clinical or radiological signs, and in many cases diagnosis can be mixed with central nervous system toxoplasmosis, acute disseminated encephalomyelitis, neurosarcoidosis etc.

Case description. A 72-year-old man was admitted to the hospital with mild left-sided hemiparesis and central facial nerve paresis on the left side. The patient underwent a non-contrast CT, which showed no evidence of ischemia, but a pathological mass in the right parietal lobe was suspected. A further brain MRI examination showed multiple peripheral contrast-enhancing lesions in both brain hemispheres. Possible brain metastases or opportunistic neuroinfection were considered in the differential diagnosis. Cerebrospinal fluid analyses were performed and neuroinfections (both bacterial and viral) were ruled out. A contrast CT scan of the abdomen, pelvis and chest excluded other possible primary pathological processes. The patient was tested for HIV, which was positive, with the possibility of AIDS stage. Due to the gradual clinical deterioration and since he received steroid therapy during hospitalisation, it was decided not to perform a biopsy.

Summary. In this case PCNSL is the most likely diagnosis for this patient, due to its high association with HIV and the exclusion of other possible diagnoses that presents with this kind of neuroradiological signs.

Conclusions. This case highlights the importance of considering PCNSL as a differential diagnosis in patients with pathological brain masses and HIV infection. Additionally, the use of steroids before biopsy may adversely affect the pathological accuracy and delay the definitive diagnosis of lymphoma.

EFFECTIVENESS OF COX2 INHIBITOR ETORICOXIB TREATMENT ON PAIN IN PATIENTS WITH ARTHRITIS

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Objectives. Evaluation effectiveness of COX2 inhibitor Etoricoxib, assessing pain intensity of patients diagnosed with arthritis

Materials and Methods. Observational prospective multicenter study was conducted in 62 family physician practices of Latvia in accordance with all requirements of ethics and good clinical practice; informed consent was obtained from all study participants. 801 patients were included: aged between 18–79; 473 (60% of all) women and 328 (40%) men. Inclusion criteria were patient compliance with the clinical indications for treatment with etoricoxib – symptomatic arthritis (osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, acute gouty arthritis) according to the investigator's consideration. All study participants received treatment with Etoricoxib once daily in dose 60 mg (67 patients), 90 mg (512 patients) or 120 mg (222 patients) for 8 ± 4 weeks. Pain intensity was measured by VAS scale (from 0 to 100 mm) before and at the end of treatment period. Safety (cardiovascular, gastrointestinal) of treatment was assessed.

Results. The mean of pain intensity in patients with symptomatic arthritis before treatment started was 50 ± 100 mm. Reduction of pain intensity is considered as clinically meaningful, if pain intensity in the end of treatment does not exceed 30 mm on VAS or if the baseline intensity is reduced for at least 50%. In 607 patients (76% of all) at the end treatment pain intensity was reduced for at least 50% from baseline. No significant adverse events were registered.

Conclusions. Treatment with Etoricoxib significantly reduces intensity of pain in majority of patients with arthritis.

EFFICACY OF CONSERVATIVE THERAPY, INTERLAMINAR EPIDURAL STEROID INJECTIONS AND THEIR BOTH COMBINATION IN RELIEVING SEVERE CHRONIC PAIN FOR LUMBAR CENTRAL SPINAL STENOSIS

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Objectives. Lumbar central spinal stenosis (LCSS) is a debilitating disorder with degeneration of the spine that results in disability and persistent chronic pain.

Materials and Methods. The randomized controlled study compares efficacy of conservative therapy (CT), interlaminar epidural steroid injections (IESI) and their both combination (CT+IESI). Primary outcomes included pain (Numeric Pain Rating Score (NRS)), disability (Oswestry Disability Index (ODI)) and quality of life (European Quality of Life Questionnaire). Outcomes analyzed as short-term (≤ 3 months), intermediate-term (3 to 6 months), and long-term (6 months to 1 year). Patients included with NRS ≥ 7 .

Results. 229 patients with symptomatic LCSS randomly assigned to CT, IESI or CT+IESI group: 87 (age 63 ± 9), 82 (age 57 ± 9) and 60 patients (age 61 ± 6), respectively. Mean improvement in physical function for CT, IESI and CT+IESI groups was 19.2 (95% confidence interval (CI) 13.6 to 24.8), 22.4 (95% CI 16.9 to 27.9) and 26.7 (95% CI 21.5 to 32.7), respectively. IESI was valuable for pain relief at short-term (MD 1.23, 95% CI 0.54–1.89; $P = 0.0002$), CT+IESI – at long-term (MD 0.85, 95% CI 0.46–1.24; $P < 0.0001$) follow-up compared with CT. There were no statistically significant differences in functional improvement after CT and IESI at short-term and intermediate-term follow up (MD 3.65, 95% CI 2.24–9.53; $P = 0.21$), however long-term functional improvement was observed in CT+IESI group (MD 0.81, 95% CI 0.48–1.31; $P < 0.0001$). Study showed that patients' satisfaction with the treatment was significantly higher in CT+IESI group (MD 1.30, 95% CI 1.12–1.48; $P < 0.0001$).

Conclusions. Basing on the results of the study, the use of combined conservative and interlaminar epidural steroid injections therapy is more effective for relieving severe chronic LCSS pain than each of these therapy methods separately at long-term. Patients also noticed more successful outcomes after receiving CT+IESI. This study might help clinicians to make decisions for the severe pain treatment of patients with LCSS.

EFFICACY OF ERECTOR SPINE PLANE BLOCK IN TWO DIFFERENT APPROACHES OF LUMBAR SPINAL FUSION SURGERY

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Objectives. The ultrasound-guided erector spinae plane block (ESPB) shows controversial data of efficacy due to variable local anesthetic distribution. The aim of the study was to evaluate the efficacy of ESPB in elective lumbar spinal fusion surgery patients with different surgical approaches.

Materials and Methods. Retrospectively were included 45 elective lumbar transpedicular fusion (TPF) surgery patients with different approaches (posterior approach(TPF) or combined posterior and anterior approach (TPF+ALIF)) divided into 2 groups:general anesthesia (GA,n = 24) and general anesthesia combined with ESPB (GA+ESPB, n = 21). Primary outcome was to analyse the efficacy of ESPB in different surgical approaches in terms of pain intensity in the first 48hours. Secondary—fentanyl free patients and opioid consumption in the first 24hours postoperatively. Comparative analysis was performed (SPSS®v.28.0). $P < 0.05$.

Results. Out of 45 patients (27 female), 21 received GA+ESPB and 24 received GA. Average age— 60.3 ± 14.3 years. Chronic back pain before the operation—56% of patients. ESPB was performed in 17TPF and in 4TPF+ALIF patients. ESPB significantly reduced pain intensity at rest in both surgical approaches 48h after surgery; $p < 0.05$. GA+ESPB when compare with GA increased the number of fentanyl free patients immediately after surgery in TPF (77% vs. 29%; $p = 0.01$) and TPF+ALIF (82% vs. 0%; $p = 0.004$) approaches. For those with ESPB fentanyl infusion was started in 6.8 ± 3.2 h and 8.9 ± 7.6 h after surgery in 23.5% of TPF and 75% of TPF+ALIF patients. Consequently, ESPB shortened postoperative fentanyl infusion time when compare with GA alone with mean difference (MD) 3.2 ± 4.2 h in TPF; $p = 0.045$ and 6.7 ± 5.3 h in TPF+ALIF; $p = 0.028$. Only in TPF+ALIF approach, ESPB reduced total fentanyl consumption compared to those with GA 1.43 ± 0.45 mg/24 h vs. 0.93 ± 0.68 mg/24 h; $p = 0.015$.

Conclusions. ESPB significantly reduces pain at rest after surgery in two different surgical approaches. ESPB reduces postoperative fentanyl requirement in both surgical approaches, reducing total fentanyl consumption and duration of infusion, especially with ALIF+TPF approach. However, ESPB doesn't always provide enough analgesia to avoid fentanyl administration completely in the first 48 hours after surgery.

EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF PAEDIATRIC ONSET MULTIPLE SCLEROSIS IN LATVIA

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Objectives. Multiple sclerosis (MS) is a chronic inflammatory autoimmune disease of the central nervous system (CNS) and most commonly is diagnosed in young adults. Pediatric-onset MS (POMS) starts before the age of 18 and it is a rare disease. POMS tends to be more aggressive compared to adult-onset MS with more frequent relapses leading to disability at younger age.

Materials and Methods. This was a retrospective study and included Children's Clinical University Hospital patients with diagnosed POMS starting from 2010 till 2022. Clinical and demographic data were collected from medical history data system.

Results. In our study group 16 patients were enrolled with mean age 15.3 ± 2.7 years at the time of first CNS demyelinating episode, 62.5% ($n = 10$) were females, 37.5% ($n = 6$) males. The annual incidence rate POMS in this time period was 0.8/ 100 000 children. Age was ranging from 7 years till 17 years, 62.5% ($n = 10$) of patients were ≥ 16 years old. Of 16 patients 75.0% ($n = 14$) were diagnosed in the last 4-year period (2019 – 2022). Symptoms at first relapse were ataxia 56.3% ($n = 9$), visual disturbances 56.3% ($n = 9$), cranial nerve deficits 43.8% ($n = 7$), sensory deficits 37.5% ($n = 6$), motor deficits 31.2% ($n = 5$), headache 18.8% ($n = 3$) and autonomic dysfunction 12.5% ($n = 2$). At least one relapse after the first event was seen in 43.8% ($n = 7$) till patients reached 18 years. Time from first till second episode ranging from 28 days till 520 days, mean 155.0 ± 162 days. Mean relapse count in one year was 3.6 ± 1.7 , range from 1 till 5 per year.

Conclusions. The incidence of POMS has been increasing in the last years, probably due to better diagnostics and increased awareness. Most POMS patients are 16 years or older. Almost half of POMS patients have relapses during childhood with high relapse frequency (≥ 3) indicating aggressive course of the disease.

EPIDEMIOLOGY AND ASSOCIATED FACTORS OF SCHIZOPHRENIA IN RIGA CHILDREN'S CLINICAL UNIVERSITY HOSPITAL CHILD PSYCHIATRY CLINIC, 2012–2021

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Objectives. Early-onset schizophrenia (EOS) is a rare manifestation of the disorder, with the development of the first psychotic episode before 18 years. Numerous risk factors may interact with the genetic predisposition to mediate the timing of onset. This study aimed to collect epidemiological data on cases of EOS in Riga Children's Clinical University Hospital from 2012 to 2021, evaluate the incidence, and identify factors associated with the age of onset of EOS.

Materials and Methods. A retrospective study included patients admitted between January 2012 and December 2021 with a diagnosis of schizophrenia. The data were collected from medical records of Riga's Children's Clinical University Hospital; in-patient and out-patient contacts were explored. Data were analyzed using statistical software IBM SPSS 26, χ^2 tests, t-test, and ANOVA tests.

Results. During the analyzed period, 49 patients were diagnosed with EOS (19 females, 30 males) with a mean age of 14.83 (± 1.74). No significant difference in the age was found between the sexes. 83.7% of subjects presented with prodromal symptoms. Several factors that could potentially influence the age of onset were detected: emotional violence (in 42.8% of patients), obstetric complications (36.7%), a first-degree relative with schizophrenia (24.5%) or other mental disorder (34.7%), parents' divorce (42.8%), drug abuse (24.5%), premature birth (16.3%), birth by cesarean section (22.4%). Having a first-degree relative with psychotic-spectrum disorder showed a statistically significant association with the age of onset: 14.50 (± 1.71) vs. 14.95 (± 1.76) ($p = 0.021$), as well as obstetric complications 14.33 (± 1.43), 15.12 (± 1.61) ($p = 0.013$).

Conclusions. Considering the controversial data about the role of different factors in EOS manifestation, our data complement the mentioned discussion. The most frequently observed factors were emotional violence, obstetric complications, and a first-degree relative with other mental disorders. A relative with psychotic spectrum disorder and obstetric complications were associated with the age of onset of EOS.

EVALUATION OF DRUG THERAPY IN POLYMORBID PATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN

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Objectives. Determine drug interactions in pharmacotherapy for chronic musculoskeletal pain (CMP) in combination with therapy for other chronic diseases for polymorbid patients (≥ 2 chronic diseases), assess the safety of therapy from the point of view of a clinical pharmacist and develop recommendations for drug interaction prevention and risk reduction.

Materials and Methods. The study design is a retrospective study at Pauls Stradins Clinical University Hospital. Data were collected from 53 polymorbid patients ($n = 53$) medical records. All patients received treatment for at least one CMP fit in 3 categories: chronic diffuse musculoskeletal pain, and back pain, peripheral joint pain. At the same time all of them had 2–13 different comorbid disorders and received treatment for them. All medications were used simultaneously over a 2 week interval.

Results. 54.7% of the pharmacotherapies were safe, but require patient monitoring. 43.4% were not safe and it is recommended to consider a therapy modification because interactions were found to be potentially dangerous. 1.9% of therapies require immediate medication change. Between the number of medications used and drug interactions, there was a strong positive correlation. The most common risks associated with drug interactions were gastrointestinal bleeding, CNS depression, decreased effect of hypertension drugs under the influence of NSAIDs, increased risk of NSAID toxicity, reduced effect of diuretics and hypoglycemic agents under the influence of opioids.

Conclusions. More than half of the therapies were safe, but almost half were not from the point of view of drug interactions and require a revision of the therapy. There are preventive measures aimed at early detection and prevention of possible interactions. The number of drugs used is correlated with the number of interactions, showing that polymorbid patients require a particularly detailed analysis of drug therapy.

EVALUATION OF EFFECTIVENESS OF INTRA-ARTICULAR STEROID ADMINISTRATION IN PATIENTS WITH HIP OSTEOARTHRITIS

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Objectives. Evaluate the efficacy and safety of the intraarticular steroids in the short term. Identify the patient's factors that could affect the effectiveness of the procedure.

Materials and Methods. Patients with isolated grade I-III hip osteoarthritis confirmed radiologically, clinically were included. Intraarticular steroid injection (Solu-Medroli 40 mg + Lidocaini 100 mg) was performed in the D.A.P "Sāpju klīnika" under X-ray control.

Data collected from the medical record: initial pain before the procedure, 30 minutes after, comorbidities, degree of osteoarthritis, used painkillers. After a month, the patients were interviewed – the patient's weight, height, pain on the 30th day, whether there was an improvement in physical functions, whether hip replacement is planned, were recorded. *GPE* measures a global assessment of change in the patient's chief complaint.

Results. Patients – 6 men, 19 women. 1 patient with grade I, 11 with II, 13 – grade III OA. Aged 53–86. The average BMI (SD) among men – 30.6 kg/m² (8.2), among women – 29.6 kg/m² (4.1). Average pain value before the procedure – 7.9 (0.9). Improvement in pain 30 minutes after the procedure among women was 6.3 (1.7) units compared to pre-procedure value, among men – 4.2 units (2.8), improvement after 1 month pain intensity for women for 4.3 units (2.1), for men – 2.3 (1.9). The effectiveness of the procedure evaluating by *GPE* scale among women 60% (27%), among men – 48% (17%), total 54%.

Conclusions.

1. Intra-articular steroids causes a reduction in pain 30 days after the procedure.
2. The effectiveness of the procedure evaluating by *GPE* scale, the average rating was an improvement of 54% – defined as a good therapy effect.
3. No correlation was identified between pain improvement and patient age, gender, BMI, pain intensity before the procedure.
4. No complications related to the procedure were found.

EVALUATION OF PRIMARY MANAGEMENT OF HEADACHE CARE IN LATVIA

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Objectives. The weight of the public-health problem associated with headaches lies not only in the lack of better education of medical professionals and the need for better drugs but also in the headache service delivery concept. Lifting The Burden (LTB) and European Headache Federation (EHF) has developed a set of headache service quality indicators. As the majority of headache patients should be treated in primary care, we assessed the quality of headache management currently in primary care in Latvia, identifying deficits and analyzing possible recommendations for improvement.

Materials and Methods. We included 5 primary-care clinics in Latvia, and interviewed 5 doctors, 2 nurses and 3 medical assistants, 5 service managers, and 157 patients, using the questionnaires developed by LTB and EHF. In addition, we evaluated 250 patients' records. Inquiries were in nine domains: diagnosis, management, referral pathways, patient education and reassurance, convenience and comfort, patient satisfaction, the efficiency of headache care, outcome assessment, and safety.

Results. During the evaluation process, we identified significant quality gaps in headache care: Histories of headaches were recorded and/or assessed insufficiently, the duration of prominent headache complaints was recorded in 20%, and headache frequency was mentioned only in 9% of records. 18% of patient records did not contain any diagnosis. No headache calendars were used nor Headache-related disability and quality of life were measured routinely. However, 75% of respondents found headache treatment good or very good.

Conclusions. Headache service quality indicators demonstrate the practical shortcomings of headache care in primary clinics. This study showed that patient satisfaction with headache care is not a good indicator of the quality of headache care.

EXPANDING PHANTOM LIMB PAIN TREATMENT POSSIBILITIES USING ROBOT ASSISTED VIRTUAL REALITY SYSTEM

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Objectives. Phantom limb pain (PLP) is a phenomenon that is recognised in amputees, brachial plexus (BPI) and spinal cord injury (SCI) individuals. Additional to PLP there usually are coexisting complex pain patterns and sensory disturbances. Previous Aspire CREATE clinical trials demonstrate encouraging results in decreasing PLP in amputees using robot assisted Virtual Reality (VR) exercises. Subsequently trial is extended to larger group of individuals suffering from complex pain and PLP.

Materials and Methods. The robotic VR system acts as mirror box therapy. Participants see first person avatar with [missing] limb. Residual muscle contractions provide avatar's movement through electromyograph. The affected limb [stump] is supported by robotic haptic feedback system to facilitate movement. Individuals participate in VR sessions performing tabletop exercised with cubes. This comprise of 9 sessions each 2 hours long in 3-week period. Three different sub-type participants were selected for this trial – amputee (x1), BPI (x2) and SCI (x1). Pain was evaluated with McGill questionnaires. Robot kinematic data was used to evaluate quality and range of movement.

Results. All participants reported diminishing of pain. No negative effects were noted. Amputee reported 50% improvement (31.5 out of 5 McGill pain score). BPI participants reached 33–50% reduction in pain score (42 and 32) and further stable pain level of 2 in follow-up weeks 3 and 9. SCI participant had 100% of pain reduction (20), but pain returned to baseline on follow-up. Increase in range of movement was noted in all participants.

Conclusions. This data demonstrates significant short- and long-term reduction of pain using non-invasive robotic assisted VR technique. This study shows the promising tendencies of extended use of this treatment modality in wider range of nerve injury patients suffering from complex PLP. This technique is deemed safe and effective.

FACE PERCEPTION, PAREIDOLIA, AND EMOTIONS: FROM HOLISTIC TO COMPONENT PROCESSING AND BACK

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Objectives. Face perception is an example for configurational perception that involves emotion perception, person identification and occurs not only in case of human faces but also in case of not-animate things (pareidolia). Our study aims to examine the real-time dynamics of face perception and the relative importance of separate facial components. Based on our results, we would like to make some outlooks regarding innovative applications of face-induced perceptual processes in cases of neural impairments

Materials and Methods. Several sets of experiments were conducted in examining the impact of facial features on the perception of emotions. Schematic face pictures were used in both an eye tracking study and a behavioural experiment. The impact of instructions was controlled.

Results. Although the first fixations are mainly (up to 85%) located in the area of eyes (corresponding with the establishment of the gaze contact), the emotion perception is a slightly later process and is driven by mouth-related facial features. Significantly increased total time of fixations on the area of mouth can be observed when the participants are asked to examine specific emotions. Only few other factors (e.g., distance between eyes and eyes and mouth) matter.

Conclusions. Our results indicate that face perception is a stage-wise process involving both configural and holistic processes. The functions of these stages are different – starting from gaze establishment and ending with emotion reading. These results offer a variety of applications in neuro-cognitive research that will be discussed in our presentation.

HEADACHE, DEPRESSION AND ANXIETY COMORBIDITY IN GENERAL PRACTICE

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Objectives. Headache disorders are one of the major public-health concerns.

The aim of the study was to find out the comorbidity of headache, depression and anxiety and how analgesics and pain intensity affect depression and anxiety.

Materials and Methods. This was a prospective study, carried out in a general practice and involved 116 adult respondents. Respondents were invited to complete a Generalized Anxiety Disorder Assessment (GAD-7), Patient Depression Questionnaire (PHQ-9), Visual analogue scale (VAS). Statistical analysis was performed with SPSS 22.0, we used The Mann-Whitney test and chi-square test.

Results. In total we included 116 respondents, 20.7% men and 79.3% women. The mean age of the group was 40.1, age group 23–72 years. Out of all respondents 68.1% had headaches (group1) and other did not (group2). Of these respondents with headache: 32.9% had chronic, 67.1% acute headache. Mean pain intensity was 4.67 (VAS). Mostly used analgesics were NSAI 74%, followed by non-opioid analgesics and triptans. During last month 59.5% of respondents took analgesics for 1–4 days. PHQ showed normal 49.1%, mild 25%, moderate 18.1%, moderately severe 5.2%, severe 2.6% depression among respondents. And normal 55.2%, mild 28.4%, moderate 12.9%, severe 3.4%. level of anxiety.

Higher depression ($p = 0.01$) and anxiety ($p = 0.03$) score were significantly associated with headache. Data analysis indicated significantly higher score of VAS in group of chronic headaches, then in acute headaches ($p = 0.03$). There was no statistically significant difference in depression ($p = 0.18$) and anxiety ($p = 0.8$) between respondents with an acute and chronic headache.

Conclusions. The results of the study show that a large number of respondents experience headaches. Also, patients with headaches have depression and anxiety as a comorbidity. The results are important to notice the possibility of the presence of depression and anxiety when working with headache patients, which would allow for faster management.

HINT1 NEUROPATHY IN LATVIA: CLINICAL, GENETIC, AND FUNCTIONAL PROFILING

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Objectives. *HINT1* variants are associated with autosomal recessive axonal neuropathy with neuromyotonia. Patients with the *HINT1* gene variant demonstrate gradual development of motor-greater-than-sensory polyneuropathy, over time, hand muscle relaxation difficulties develop.

The majority of patients are compound heterozygous or homozygous for a Slavic founder variant (c.110G > C, p.Arg37Pro). In Latvia, the frequency of variant p.Arg37Pro is the highest known so far.

This is the first systematic assessment of *HINT1* neuropathy in Latvia.

Materials and Methods. All patients diagnosed with axonal neuropathy with neuromyotonia (*HINT1*—neuropathy) in Latvia (n = 10) from geneticists, neurologists and paediatric neurologists' clinical practices were recruited into this study. Axonal neuropathy with neuromyotonia was diagnosed based on clinical symptoms, a neurophysiological examination and positive genetic testing.

Results. To assess the phenotypes of *HINT1* neuropathy patients, we analyzed 10 patients diagnosed with axonal neuropathy with neuromyotonia—2 male and 8 female—with ages ranging from 13 to 64 years.

In all cases, nerve conduction velocities were nearly normal, with a severe decrease in motor amplitudes, and concentric needle EMG displayed neuromyotonic discharges. In the patient group with pure motor axonal neuropathy, myotonic symptoms in the legs were more severe, with spastic gait disturbances.

Ultrasonography was performed on 4 patients out of 10 who had *HINT1* neuropathy. The nerve cross-sectional areas of the median and ulnar nerves were closer to the lower limits of the normal value. None of the investigated nerves had structural changes. In all patients with *HINT1* neuropathy, ultrasound examination showed significantly reduced muscle volume as well as spontaneous fasciculations and fibrillations.

Conclusions. Our study is the first detailed ultrasonographic evaluation of patients with *HINT1* axonal polyneuropathy. The best-known and most widespread disease-associated variant is p.Arg37Pro. Overall, the genetic epidemiology suggests that *HINT1* neuropathy should be considered in the diagnostic work-up of patients of European descent presenting with axonal CMT.

IDIOPATHIC HYPERPLASTIC PACHYMENINGITIS: CASE REPORT

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Objectives. Idiopathic hyperplastic pachymeningitis (IHP) is a disease affecting the dura mater. Pachymeningitis usually causes progressive cranial nerve neuropathies, chronic headaches, and cerebellar dysfunction, which significantly reduces quality of life. Aim of the study is to demonstrate a clinical case of a rare neurological disease.

Materials and Methods. A single patient with IHP is reviewed in a retrospective study.

Results. Patient was hospitalized with complaints about chronic headaches, photophobia, phonophobia, dizziness and balance disorder. Chronic granulomatous uveitis, iridocyclitis associated with positive HLA B27 with secondary glaucoma in both eyes since 2019 is known from anamnesis.

In July, 2020 patient had an aseptic meningitis, left-sided pneumonia. Patient consulted by ophthalmologist and got therapy for iridocyclitis. Etiology of the meningitis wasn't detected.

First time patient examined by neurologist in summer of 2021, while she was hospitalized due to chronic headaches. There was a pleocytosis (160/mkLL) in a cerebrospinal fluid and clinical picture of serous meningitis. Head MRI, CT of the chest and abdomen, cerebrospinal fluid multiple analyses were done, but etiological cause has not been identified.

Patient's condition became worse in October 2021, she had an visual and hearing impairments, so patient was re-hospitalized in Neurology ward. Repeated lumbar puncture shown negative dynamics – pleocytosis increased (311/mkl). After repeated examination, patient was offered to do the meningeal biopsy to clarify the etiological factor of chronic meningitis. As the result chronic hyperplastic meningitis morphology is presented, and inflammation of an autoimmune etiology cannot be ruled out.

Patient received a course of *Rituximab* therapy (1000 mg twice). In October, 2022 patient had a MRI for IHP control in dynamics – any new intracranial changes not detected. In the background of the *Rituximab* therapy, progression of the disease has stopped.

Conclusions. This clinical case shows that in patients with chronic pachymeningitis of undetected etiology a meningeal biopsy should be done.

INTEGRATIVE APPROACH TO NEUROCOGNITIVE AND PERCEPTUAL PROCESSES

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Objectives. Current research in cognitive neuroscience and related areas indicate the need for a more interrelated and inclusive approach to numerous canonical approaches. In research on human perception variety of foundational perceptual processes (such as grouping, shape assignment) are only rudimentary explored in respect to neurocognitive impairments. But configurational perception is eventually possible only in case of absence of any neurocognitive impairments and neurodegenerative diseases. This overview presentation will provide an introduction into the series of research reports varying from applied radiological to foundational issues in research on human perception.

INTERICTAL CORRELATIONS BETWEEN BODY MASS INDEX AND CYTOKINES LEVELS IN MIGRAINE

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Objectives. The aim of the study was to clarify correlations among body mass index (BMI) and serum levels of cytokines in migraine with and without aura female patients during interictal period

Materials and Methods. 14 migraineurs with aura, and 12 – without aura during their interictal period were compared with age and BMI matched 25 controls. Interleukin-8 (IL-8), soluble intercellular adhesion molecule-1 (sICAM-1), soluble vascular cell adhesion molecule-1 (sVCAM1), matrix metalloproteinase-9 (MMP-9), interferon gamma (IFN- γ), monocyte chemoattractant protein-1 (MCP-1), transforming growth factor alpha (TGF- α) and plasminogen activator inhibitor-1 (PAI-1) were measured in serum by ELISA method.

Results. Migraineurs had significantly increased levels of IL-8, but decreased serum levels of PAI-1 and sICAM-1 during the interictal period, regardless of aura. BMI correlated with BP, and also with IFN- γ and MMP-9 only in patients with aura.

Conclusions. There were three correlations in migraine patients with aura that were absent in patients without aura: between IL-8 and PAI-1; MMP-9 and IL-8; IL-8 and sICAM-1. Migraineurs without aura, on the other hand, had correlations that patients with aura did not have (between PAI-1 and MCP-1, sICAM-1; between MMP-9 and sICAM-1, MCP-1; between TGF- α and PAI-1, MMP-9, sICAM-1; between sICAM-1 and MMP-9, PAI-1, MCP-1; as well as between sVCAM-1 and MCP-1). PAI-1, TGF and MMP-9 could be used as biomarkers to distinguish migraineurs from healthy individuals.

INTERNAL VALIDITY OF THE LATVIAN VERSION OF 16-ITEM PRODROMAL QUESTIONNAIRE PQ-16 IN HELP-SEEKING POPULATION IN RIGA CHILDREN'S CLINICAL UNIVERSITY HOSPITAL PSYCHIATRY CLINIC – FIRST STEP DESCRIPTION

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Objectives. One of the goals of early interventions is to recognize the prodromal phase of the disorder. Most psychotic disorders begin with a prodromal period of altered functioning before the onset of the acute state; several interviews have been developed to determine whether individuals present with prodromal symptoms. The 16-item Prodromal Questionnaire (PQ-16) is a screening tool for evaluating those at risk of developing a psychotic disorder. Despite the spread of similar instruments, such methods were not previously available in Latvia. The current study aims to evaluate the psychometric properties of the Latvian version of the PQ-16 in a sample of help-seeking adolescents referred to the Child psychiatry clinic and to make it available in the local clinical practice.

Materials and Methods. A prospective study included patients admitted between December 2022 and January 2023 in Riga's Children's Clinical University Hospital Psychiatry clinic. The data were collected during outpatient consultations by child psychiatrists. Data were analyzed with SPSS 28, χ^2 , t-test, ANOVA tests were used, and the diagnostic accuracy and internal validity were examined.

Results. 44 adolescents aged 12–17 participated in the study 86.4% female. The mean age was 15.2 (± 1.58). The majority of respondents (81.8%) scored above the current cut-off of ≥ 6 points, with a mean of 18.56 (CI 15.50–21.62). We found no sex differences or correlations with age. Patients with a history of experiencing emotional violence had significantly higher scores ($p < .001$). During the internal validation process, 15 of 16 items of the scale were tested valid with $p < .001$. The instrument had a high degree of internal consistency, with Cronbach's Alpha 0.873.

Conclusions. The Latvian translation of PQ-16 is valid and can be used in the clinical environment. The current cut-off score of ≥ 6 points, which suggests a high probability of an at-risk mental state in a patient, has to be adjusted for the Latvian population.

LATE-ONSET MULTIPLE SCLEROSIS

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Objectives. To describe the clinical and radiological characteristics of multiple sclerosis patients who were first diagnosed with multiple sclerosis after the age of 40 years and to determine the proportion of these newly diagnosed late-onset multiple sclerosis patients.

Materials and Methods. Patient data from the Multiple sclerosis unit of Riga East University Hospital was collected and medical histories of patients who were newly diagnosed with multiple sclerosis (ICD-10 G35) after the age of 40 years were enrolled from January 1st, 2019 till December 31st, 2022. Data about clinical characteristics and cerebral and spinal MRI were obtained. The SPSS 29.0 program was used for statistical data analysis.

Results. We identified 176 newly diagnosed MS patients of which 44 (25%) had late-onset multiple sclerosis (LOMS), with a mean age of 50.4 years at the time of diagnosis. The average duration of symptoms before the time of diagnosis was 6.48 years. The LOMS group had a higher proportion of females (68.2%) and patients with relapsing-remitting disease course (84.1%). The mean EDSS score was 2.48. The most common changes in MRI findings were one to five juxtacortical (n = 18, 40.9%) and infratentorial (n = 27, 61.4%) lesions. 36 patients (81.82%) had spinal cord lesions – most commonly one to five lesions in cervical and thoracic parts (respectively, n = 23 (52.3%) and n = 25 (56.8%)). 20 patients presented with optical nerve demyelination, but atrophy was determined for 15 patients. Overall, 16 patients (36.37%) were diagnosed with varying severity types of brain or spinal cord atrophy.

Conclusions. LOMS patient population had a higher proportion of females and patients with relapsing-remitting disease course. 81.82% of patients had spinal cord lesions on MRI. LOMS patients accounted for 25% of the total number of newly diagnosed multiple sclerosis patients, which can be due to the fact that the symptoms of MS in these patients appeared several years before the diagnosis.

LOW SELF-ESTEEM AS A RISK FACTOR FOR DEPRESSION INCIDENCE AMONG HEALTHCARE WORKERS DURING COVID-19 PANDEMIC IN LATVIA

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Objectives. It is a well known fact that higher risk for developing depression is associated with lower levels of self-esteem but causality of it still remains an unanswered and highly debated question. Aim of the study is to assess 9 months incidence of depression and its association with self-esteem levels among health care workers (HCW) during COVID-19 pandemics in Latvia.

Materials and Methods. A longitudinal quantitative study in the population of HCW in Latvia was done during April-June 2020 with repeated online surveys. Data was collected every 3 months in a 9 month period. Participants were selected by a non-probability sampling approach. Participants without symptoms of depression during the first survey were included in later surveys. Depression was assessed using Patient Health Questionnaire-9 (PHQ-9), cut-off score-10. Self-esteem was assessed using the Rosenberg Self-Esteem scale (RSES) where a score of 10-25 indicates low, 26-29 medium and 30-40 high level of self-esteem. Data analysis was performed using SPSSv25 and analysed with the Chi-Square Test.

Results. 232 HCW were included in data analysis, of whom 40.9% (N = 95) developed symptoms of depression during the first 9 months of pandemics. In the beginning 7.3% had a low, 13.8% medium and 78.9% high self-esteem levels, after 9 months – 13.4, 20.3 and 66.4%. Rosenberg's self-esteem test median for those with depression decreased from 32 (IQR 27.0–36.0) to 29 (IQR 25.0–33.0), for those without depression – 34 (IQR 32.0–37.0) and during 9 months median didn't change (IQR 30.0–38.0). Lower self-esteem was associated with higher 9 months incidence of symptoms of depression ($p < 0.001$).

Conclusions. 40.9% of HCW developed symptoms of depression during the first 9 months of COVID-19 pandemics in Latvia. Those HCW with lower self-esteem scores after 9 months were more likely to develop depression. The study reveals that self-esteem is a variable that is associated with incidence of symptoms of depression.

MILDEST DESCRIBED 17P13.3 MICRODELETION SYNDROME: CASE REPORT

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Objectives. Background: Microdeletions in chromosomal region 17p13.3 are associated with neuronal migration disorders, with *PAFAB1H1* being the major gene affected. The genomic imbalances, including the *YWHAE* and *CRK* genes, cause more severe structural brain malformations. The spectrum ranges from an isolated lissencephaly sequence to Miller-Dieker syndrome. Patients carrying only *YWHAE* and *CRK* deletions but sparing *PAFAH1B1* may have growth restriction, neurodevelopmental delay, common craniofacial features, structural brain abnormalities.

Case presentation:

We describe the case of a 2 years and 7-months old girl with 17p13.3 microdeletion syndrome. The patient is a carrier of *YWHAE* and *CRK* deletions, but she lacks *PAFAH1B*. Her current height is 78 cm (> -3SD), weight 9 kg (> -3SD). She began walking at 14 months, her gait is consistent with her age. Her communication skills partially correspond to her age.

The first signs appeared right after birth. she had developed stigmas – low-set ears, a short neck, wide eye gap. She had an enlarged large fontanel (3 x 3 cm), umbilical hernia, diffuse hypotonia, and a prolonged bleeding episode after biopsy. Hirschsprung's disease was suspected. The first visit to the geneticist was at 2 months of age. Noonan, DiGeorge syndrome, inherited metabolic disorders were excluded. Later, whole exome sequencing confirmed 17p13.3 microdeletion syndrome.

Although patients with 17p13.3 microdeletion syndrome have relevant structural brain abnormalities in most cases, this case was different. Her MRI findings showed wider liquor spaces in the basal ganglia, slightly wider lateral ventricles. However, no characteristic MRI changes for neuronal migration disorders were found.

Conclusions. We describe a rare case in which a patient with 17p13.3 microdeletion syndrome has severe growth restriction but no characteristic structural brain abnormalities. Thus, our experience shows that confirmed genetic analysis is not always consistent with all described malformations and helps to broaden the phenotype of 17p13.3 microdeletion syndrome.

MILIARY TUBERCULOSIS WITH CENTRAL NERVOUS SYSTEM INVOLVEMENT IN PAEDIATRIC PATIENT

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Objectives. Miliary tuberculosis is a form of extrapulmonary tuberculosis (TB) due to hematogenous dissemination of mycobacteria and according to published data, it occurs in about 1–2% of all cases of TB. Clinical manifestations are usually nonspecific and vary from organ system affected. We report a case with presentation of miliary tuberculosis with severe central nervous system involvement.

Patient, 17 years old, previously healthy, female was admitted to Children's Clinical University Hospital with complaints of subfebrile body temperature, dizziness and gait instability. On examination, the patient had ptosis of the right eyelid and ataxia with right arm and leg.

Computed tomography (CT) was performed where structural brainstem and white matter hypodense abnormalities were detected with differential diagnosis between inflammatory process or neoplasm. Magnetic resonance imaging (MRI) of the brain was performed which indicated meningoencephalitis.

Cerebrospinal fluid (CSF) analysis showed pleocytosis (44 cells/uL) with lymphocytic predominance, increased protein (2.15 g/L) and decreased glucose (1.11 mmol/L) levels.

CT of the lungs showed miliary tuberculosis. Therapy with rifampicin, isoniazid, pyrazinamide, ethambutol was started. Patient had a positive Quantiferon-TB test, M. tuberculosis DNA was detected in urine, feces, CSF and sputum. 4 days after admission, the patient had a rapid decline of consciousness, CT showed hydrocephalus due to obstruction of cerebral aqueduct. Ventriculoperitoneal shunting was performed. In the following days a stroke in the left middle cerebral artery occurred due to TB related vasculitis. On discharge, the patient had sensorimotor aphasia, asymmetric tetraparesis, elevated deep tendon reflexes and pathological reflexes on both sides.

Despite the fact that nowadays the meningoencephalitis caused by tuberculosis is very rare, we should keep in mind such a possibility to be able to diagnose and start therapy as soon as possible. Even with fast diagnosis and initiation of treatment, mortality and serious neurological sequelae rates continue to be high in central nervous system tuberculosis.

MUNCHAUSEN SYNDROME IN TEENAGER

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Objectives. The girl was first admitted to Children's Clinical University Hospital at 16 years of age. She misled medical staff for 2 years with fake, simulated symptoms of various illnesses that required specific tests, exams, surgical manipulations and medications.

Materials and Methods. First patient was hospitalized in 2018 at Liepāja hospital with severe head pain, migraine with aura attack. Since then, the patient developed desire to get the attention of the medical staff, purposefully triggered episodes of fainting by hyperventilating herself. In 2019, patient hospitalized with severe abdominal pain, wearing makeup to appear sicker, moved the crawls, mimicking severe pain. She has taken diarrhea medicines from home and started taking them in a hospital, therefore she has been investigated in the infection unit for a long time. After returning to hospital month later, she hasn't eaten or drunk for a week, didn't sleep at night to "look in a more horrific state, more severely ill" and then had special overeating and complaining to her parents about stomach aches. At the beginning of 2020, the girl was re-hospitalized. On this occasion, she received medication through the syringe and started saving the syringes herself, later using them to introduce her saliva into the I/v catheter. Exams show *Raoultella arnii* growing in the blood, which was also a key factor in thinking about Munchausen syndrome and prescribing psychiatrist counseling. Within a year and a half, 12 hospital admissions in the psychiatric profile unit due to self-destructive behavior. There were 12 endoscopy examinations within 2 years due to ingestion of foreign bodies (pencils, candy packs, plastic spoons, broken pens, masks, gauze, stones, glasses, batteries). 38 pediatric surgeons' consultation or surgical manipulations were committed. There have been 4 consultations, received 26 CBT sessions, physiotherapy course, has received medication therapy, however, without significant positive dynamics.

MYXOPAPILLARY EPENDYMOMA WITH EXTENSIVE LOCAL INVASION AND DISTANT DISSEMINATION – THERAPEUTIC DILEMMA

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Objectives. Myxopapillary ependymomas (ME) are a group of glial tumours with predilection to the lumbosacral region, typically affecting males in the 4th decade of life. ME develop from the ependymal cells of the conus medullaris appearing as intradural, extramedullary mass on imaging studies. Due to slow growth and scarce clinical presentation the diagnosis of ME is often delayed, when local tissue invasion and dissemination have already occurred. Even though ME have low metastatic potential, they may exhibit aggressive and recurrent clinical course and therefore are now classified as Grade II tumours, according to the 2021 WHO classification of ependymal neoplasms.

Complete surgical resection is the therapy of choice. In case of extended dissemination adjuvant radiotherapy is recommended.

This report presents a case of a 45-year-old man with a two-year history of nonspecific lower back pain. Spine X-ray showed mild degenerative changes. Unenhanced MRI of the lumbar spine showed an intradural, extramedullary, expansive tumour at the level L1-S4 with erosion of the sacral bone and invasion of presacral tissue, that appeared hypointense on T1 and hyperintense on T2. Based on the typical localisation and growth pattern ME was suspected. Contrast enhanced MRI showed heterogeneous enhancement, typical for advanced ME. Biopsy confirmed the preliminary diagnosis. During biopsy remodelling and extreme thinning of the sacral bone was identified, with high risk of pathological fracture resulting in unstable pelvis, making partial tumour resection with laminectomy and laminoplasty necessary. Preoperative neural axis MRI showed contrast enhancing lesions in cerebellum, cervical and thoracic spine – ME metastases, therefore adjuvant radiotherapy was administered. Post-operative imaging showed gross reduction in lumbar tumour, oedema of the nerve roots. Control MRI a year after operation showed increase in residual tissue in the surgical bed as well as augmentation of size and number of metastases along the neural axis.

NERVE ULTRASOUND AS A HELPFUL DIAGNOSTIC TOOL FOR RARE HEREDITARY NEUROPATHIES' EVALUATION

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Objectives. Mutations in the histidine triad nucleotide-binding protein 1 (HINT1) are associated with autosomal recessive axonal neuropathy with neuromyotonia. The phenotype of HINT1 patients and diagnostic criteria has not been fully established. The goal of the study was to describe nerve and muscle ultrasound findings in rare disease patients' group as an additional feature for HINT1 neuropathy and compare it with other hereditary and inflammatory neuropathies, and patients with amyotrophic lateral sclerosis with axonal changes.

Materials and Methods. Ten patients with genetically approved HINT1 neuropathy were recruited. All patients underwent neurophysiological studies, a nerve conduction study (NCS), and needle electromyography (EMG). Neuromuscular ultrasonography (NMU) was performed on 4 patients with HINT1 neuropathy, 2 patients with CMT1A and 2 patients with autoimmune neuropathies and one patient with rare gelsolin amyloid neuropathy and amyotrophic lateral sclerosis.

Results. We analyzed 10 patients with ages ranging from 13 to 64 years. Electrophysiological studies demonstrated axonal polyneuropathy. Ultrasound presented following: the cross-sectional areas of the median and ulnar nerves were closer to the lower limits; significantly reduced muscle volume as well as spontaneous fasciculations and fibrillations in all patients with HINT1 neuropathy. CMT1A, autoimmune neuropathies' and AGel patients had enlarged cross-sectional areas of the nerve and changes in the nerve structure. Patients with ALS and axonal changes in NCS had similar cross-sectional areas of the nerve and normal nerve structure. Like patients with CMT1A, AGel neuropathies and ALS had similar muscle changes with spontaneous activities.

Conclusions. Our study was the first detailed ultrasonographic evaluation of patients with HINT1 axonal polyneuropathy and supported general descriptions of ultrasonography in axonal polyneuropathy. Future studies with electrophysiological and ultrasound examination for different hereditary neuropathy groups can be a useful diagnostic tool for rare peripheral nervous systems disease groups.

NEUROFILAMENTS IN NEUROLOGICAL DISORDERS – NEUROLOGIST’S MULTITOOL FOR ROUTINE DIAGNOSTIC WORK-UPS

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Objectives. This Laboratory quality assessment project aims to demonstrate the robust capacity of NfH to differentiate CNS from PNS pathology in patients presenting with suspected motor neuron disease and to compare measurements of NfL with NfH in both serum and CSF.

Materials and Methods. 53 consecutive patients presenting with suspected neurodegenerative disease received a routine neurological workup including neurophysiology (ENG, EMG, SEP, MEP), neurosonography (High-resolution neuroulttrasound), and CSF analysis with Leukocyte count, Reiber-Felgenhauer-Diagram, Borrelia antibody specific indices (AIs), NfH determination. Based on the final diagnosis we compared the groups of motoneuron-disease- (MND) patients with PNS-disease patients and non-MND CNS-disease patients. Another 79 consecutive patients with various CNS-, PNS- or psychiatric diseases (e.g. neurological etiology excluded) were evaluated. The correlation of serum with CSF concentrations of both NfL and NfH was calculated. Both were measured using high sensitivity ELISA platforms (Euroimmune (Lübeck, Germany) and Umandiagnostics (Umea, Sweden)).

Statistically, groups were compared using one-way ANOVA (or one-way ANOVA on ranks) applying a post-hoc test for direct group comparisons. Correlations were based on Spearman’s method according to the data distribution (by Shapiro-Wilk test). Statistics were performed with Jamovi 2.3.21.0 based on R 4.2.2.

Results. NfH differed significantly between patients with MND, other CNS diseases and PNS diseases ($p = 0.005$). The best Youden-Index, which displays the best trade-off between sensitivity and specificity, was observed at a NfH concentration of 1449 pg/mL ($YI = 0.65$, $AUC_{ROC} = 0.85$) for the detection of MND. The intercorrelations between serum NfH and NfL measurements were significant (Spearman’s $p < 0.001$) with the highest rho of 0.853 for the correlation between CSF NfL and CSF NfH.

Conclusions. The use of CSF-NfH/NfL is for nearly every neurological differential diagnostic setting. Neurofilaments in the CSF discriminate patients with neurodegenerative from those with PNS-diseases, which is especially important for patients presenting with suspected Amyotrophic Lateral Sclerosis.

NEUROINFLAMMATION IN PATIENTS WITH OSTEOARTHRITIS: PILOT STUDY

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Objectives. Nowadays, osteoarthritis (OA), a common, multifactorial musculoskeletal disease, is considered to have a low-grade inflammatory pathogenetic component. Lately, neuropsychiatric sequelae of the disease have gained recognition. However, a link between the peripheral inflammatory process of OA and the development of neuropsychiatric disorders is not completely understood. Neuroinflammation, stemming from peripherally produced cytokines, has been suggested to be the causal factor of neuropsychiatric disease. The objective is to study the brain morphology of OA patients using neuroinflammatory markers.

Materials and Methods. Post-mortem brain specimens have been acquired from the Douglas-Bell Bank of Canada.

Six patients were chosen. Of them, three were assigned to the OA group, based on the provided medical records, and three were assigned to the control group. Routine staining and immunohistochemical reaction were performed for the Ionized calcium binding adaptor molecule 1 (Iba1) and CD68 to facilitate visualization of microglial cells as well, as staining for Glial Fibrillary Acidic Protein (GFAP) to visualize reactive astrocytes. Semi-quantitative analysis has further been performed to assess inter-group differences.

Results. In the OA group, strong immunoreactivity within cellular bodies of microglial cells and cellular processes that revealed a mossy-like appearance was demonstrated in post-mortem brain specimens for the Iba1 marker. Similarly, the presence of phagocytotic activity with the contribution of microglial cell lysosomes confirmed by the use of CD68 staining was recognized in the brain tissues of OA patients. Apart from the involvement of microglial cells in the process of neuroinflammation, the multifunctionality of astrocytes in the brain of OA patients has been proven by the appearance of diffuse strong and arborizing immunostaining for GFAP.

Conclusions. Patients with OA demonstrate morphological alterations in the brain characteristic of microglial and astrocytic cell activation. However, due to a known functional polymorphism of these cells, further investigation is necessary to assess the relevance of the results to the hypothetical neuroinflammatory process.

OBSTRUCTIVE SLEEP APNOEA EFFECT ON CAROTID INTIMA MEDIA THICKNESS IN PATIENTS HOSPITALISED WITH ISCHEMIC STROKE

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Objectives. Determine how different polygraphic parameters in patients with obstructive sleep apnea (OSA) are associated with carotid intima-media thickness (CIMT) and ischemic stroke severity.

Materials and Methods. In this prospective study 31 patients hospitalised with ischemic stroke were examined with polygraphy and carotid artery doppler ultrasonography. During hospitalisation patient stroke severity was assessed with National Institute of Health Stroke Scale (NIHSS). During doppler ultrasonography CIMT was assessed on a.carotis communis posterior wall 1 cm below carotid artery bifurcation, also stenosis on symptomatic side in corresponding vascular territory was recorded. Following parameters were determined in polygraphy: apnea index, hypopnea index, apnea-hypopnea index (AHI), lowest saturation during polygraphy, average saturation, desaturation index, heart frequency and heart rate variability index. OSA severity was determined by AHI. For data analysis Microsoft Excel and IBM SPSS 26 was used.

Results. In patients that participated in study median age was 66 years (IQR 58-76). Most prevalent etiologies of ischemic stroke were cardioembolic stroke 41.9% (N = 13) and atherothrombotic stroke 22.6% (N = 7). Mostly patients had partial anterior circulation strokes 71% (N = 22), of those most prevalent were a.cerebri media sinistra 38.7% (N = 12) and a.cerebri media dextra 29.0% (N = 9) location strokes. In this research CIMT did not show statistically significant correlation using Spearman correlation analysis with any polygraphic parameters. On the other hand Spearman correlation analysis showed statistically significant moderate degree of association between symptomatic circulatory region and polygraphic hypopnea index $r(16) = 0.594$, $p = 0.015$ and desaturation index $r(16) = 0.532$, $p = 0.034$.

Conclusions. This research did not find statistically significant association between CIMT and polygraphic parameters in patients with OSA, although this possibly could be because of small sample size and due to limitations on ultrasonographic assessment. It was found that hypopnea index and desaturation index showed statistically significant correlation with symptomatic stenosis degree.

PAEDIATRIC CHARCOT-MARIE-TOOTH DISEASE – LONGITUDINAL EVALUATION OF POTENTIAL DISEASE PROGRESSION BIOMARKERS

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Objectives. Charcot-Marie-Tooth disease (CMT) is the most common hereditary neuropathy, often presenting in childhood. Currently, there are no effective treatment and biomarkers for disease severity and progression available. However, plasma neurofilament light chain (NfL) has been reported as a potential marker for disease activity. The aim of this study was to characterize the paediatric CMT (pCMT) cohort in Latvia and demonstrate the clinical disease progression and the change of NfL levels over a 3-year-period.

Materials and Methods. 21 CMT patients under 18 years of age were enrolled in the study. Repeated evaluation was performed in 11 patients in a 3-year interval. Disease severity was evaluated with CMT Neuropathy Score Version 2 (CMTNSv2). Plasma NfL concentration was measured using the Single molecule array (Simoa) NfL assay.

Results. 21 pCMT patients with mean age 12 (SD = 4) were enrolled in the study. 11/21 of patients were female. CMT subtypes included CMT1A (n = 9), CMTX1 (n = 2), HINT (n = 2), CMT2A (n = 1) and HNPP (n = 1). For a quarter of patients (N = 5) the genetic cause was unknown, while one patient was not tested. On the repeated evaluation CMTNSv2 did not change (0.0, IQR = 0) from the baseline and median NfL levels decreased (−1.1 pg/mL, IQR = 4.4). There was no difference in plasma NfL concentration between genetic CMT subtypes (p = 0.058). There was no association between the change in plasma NfL concentration and change in disease severity (Spearman correlation, r = 0.256, p = 0.447).

Conclusions. In this study most common pCMT type is CMT1A, and in 24% (n = 5) of cases the genetic diagnosis is unknown. No progression of the disease severity over a 3-year interval was detected. Furthermore, median NfL level decreased. Consequently, our data reveal that NfL level does not reflect the rate of disease progression in pCMT.

PANDEMIC IMPACT ON MENTAL HEALTH: WHY DO WE NEED TO KEEP TALKING ABOUT COVID-19?

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Objectives. One of the largest global crises, the COVID-19 pandemic has had a severe and far-reaching impact on the mental health of society, health systems, and economies.

Materials and Methods. The presentation will focus on the impact of pandemic on public mental health, neuropsychiatric complications in COVID-19-infected people, and COVID-19 risks in persons with existing mental illness.

Results. A large international study from 40 reported a deterioration in mental state, family dynamics and everyday lifestyle. Although the prevalence of depression in the general population of Latvia was lower in comparison with other countries, it has been found that suicidal thoughts increased in 13.30% of those with a history of depression, and 27.05% of those with a history of suicidal attempts. Risk groups for psychiatric disorders were identified, such as mental health problems in the past, loneliness, worries about health, stigmatization in case of infection with COVID-19, and information from the Internet. The number of outpatient visits in the F4 diagnosis group (ICD-10) at the Riga Centre of Psychiatry and Narcology, has almost doubled since 2019. Moreover, in Western world people with severe mental illness were hospitalized with COVID-19 twice as often as those without the condition, and that mental illness was associated with higher rates of death compared to other medical conditions. There is a growing evidence that a number of patients with COVID-19 may experience a range of neuropsychiatric symptoms, persisting or even presenting following the resolution of acute COVID-19.

Conclusions. During the COVID-19 pandemic, the mental health of society took a hit, especially with the increasing prevalence of depression and anxiety. Pre-existing mental illness is associated with worsening of mental health due to pandemic and increased COVID-19 risks. Post-COVID neuropsychiatric complications are common and underestimated problem. There is a need to prioritize research on COVID-19 and mental health.

PATIENT REPORTED ACUTE PAIN TREATMENT OUTCOMES IN HOSPITAL OF TRAUMATOLOGY AND ORTHOPAEDICS

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Objectives. Assessment of patient satisfaction is an important indicator of acute pain treatment. Although clinicians aim to reach lower pain scores, less attention is drawn on quality of pain relief with treatment from patients' perspective.

Materials and Methods. Hospital of Traumatology and Orthopaedics (TOS) in Riga has joined international pain registry PAIN OUT. PAIN OUT is an international quality improvement and registry project that provides a unique and user-friendly web-based information system to improve treatment of patients with post-operative pain. Patients were offered to fulfill a questionnaire on experienced postoperative pain, achieved pain relief, felt side effects on first postoperative day.

Results. Data from 2 first months (November-December 2022) was analyzed; 63 patients filled the questionnaire. Patients reported maximal postoperative pain from 0 to 10 points NRS, median – 7 NRS. Minimal reported postoperative pain ranged from 0 to 9 points NRS, median – 2. 38 of 62 patients (61%) marked feeling helpless and 45 out of 62 patients (73%) feeling anxiety of some level because of the pain. One fourth of patients reported being in severe pain more than 50% of time since the surgery. Most of the patients (80%) did not desire more pain treatment and showed high satisfaction rates with received treatment.

Conclusions. Despite experiencing severe postoperative pain and some level of helplessness and anxiety most of the patients did not want more pain treatment.

PATIENT WITH MYELIN OLIGODENDROCYTE GLYCOPROTEIN ASSOCIATED DISEASE AND THROMBOPHILIA: CASE REPORT

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Objectives. MOG (Myelin Oligodendrocyte Glycoprotein) antibodies have been identified as a potential cause of neurological disorders, including optic neuritis, which is an inflammatory disorder that affects optic nerves, while thrombophilia is a condition that increases the risk of blood clots. The aim of this study is to present the complexity of treating patients with concomitant rare diseases.

Results. A 59-year-old female experienced four episodes of anti-MOG antibodies-associated optic neuritis. The first episode in January 2022 resulted in complete blindness in the right eye. The patient received *Methylprednisolone* 3000mg intravenously continuing with oral *Methylprednisolone* 48mg by decreasing doses, which led to gradual recovery of vision. Reducing steroid doses, the patient developed worsening vision in the left eye in March and April 2022, therefore receiving the same therapy as previous. In May 2022, an MRI revealed bilateral retrobulbar lesions within the optic nerves without other abnormalities. Further investigation detected positive MOG antibodies in cerebrospinal fluid. Therefore, the therapy with *Mycophenolate mofetil* 1000mg twice a day was started, continuing to receive oral *Methylprednisolone* 48mg by gradually reducing doses. The patient experienced another recurrent neuritis in September 2022 despite the therapy. Upon further investigation subsequent MRI with a one-month interval showed asymptomatic strokes in the right middle cerebral artery. Other potential stroke causes were excluded, so genetic analysis was performed, identifying *Leiden V* heterozygous and homozygous mutations, confirming diagnosis of thrombophilia, for which the patient initiated oral anticoagulant therapy. Considering underlying disease course, in December 2022, the patient was prescribed *Rituximab* 1000mg intravenously twice with a two-week interval, continuing to receive *Mycophenolate mofetil* and *Methylprednisolone* 16mg. There have been no recurrent episodes since receiving therapy.

Conclusions. The case highlights complexity of treating patients with concomitant rare diseases, emphasizing the need for a comprehensive approach to diagnosis and treatment, including alternative therapies in addition to first-line treatment.

PERORAL DISEASE-MODIFYING DRUG COMPLIANCE AMONG PATIENTS WITH MULTIPLE SCLEROSIS IN RIGA EAST CLINICAL UNIVERSITY HOSPITAL MULTIPLE SCLEROSIS UNIT

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Objectives. The aim of the study was to analyse the adherence to oral DMT and factors influencing it, as well as treatment outcomes in MS patients.

Materials and Methods. In cross-sectional study 37 MS patients from Riga East University Hospital with prescribed peroral DMT were enrolled. Patients responded to a questionnaire about adherence, and completed a Symbol Digit Modalities Test (SDMT). Magnetic resonance imaging (MRI) and Expanded Disability Status Scale (EDSS) were performed. The data was analyzed using SPSS.

Results. The study included 22 (59%) women. Mean age was 40.1 years (SD 11.234).

Median range of an average missed doses (AMD) per year was 0.5, with maximum – 80 times per year. 26 (70%) patients at least once missed a dose. 42.3% of them (n=11) missed 1–2 doses for all treatment period, 38.5% (n=10) missed 3–5 doses, and 19.2% (n=5) missed doses regularly.

6 patients (16.2%) answered that it is difficult to use the DMT every day.

Mean number of new lesions in the last MRI was 1.14 (SD 1.686), and the mean number of relapses for the past year was 0.43 (SD 0.647), 24 patients (64.9%) had no relapses during the last year, 10 (27%) had 1 relapse during the last year, and 3 patients (8.1%) had 2 relapses.

A difference was found between genders in AMD per year (men > women), $p = 0.049$.

The distribution of AMD per year was the same in group of patients, who had a relapse during the last year and who had not.

There was no correlation found between AMD per year and SDMT score, EDSS score, the number of new lesions in the last MRI.

Conclusions. Our study data shows that non-compliance to DMT is more common in men. There is no correlation between patient's adherence and SDMT score, EDSS score, and the number of new lesions in the last MRI.

PHYSIOTHERAPISTS NEEDS FOR CONTINUOUS EDUCATION IN PHYSIOTHERAPY IN MENTAL HEALTH: QUALITATIVE SURVEY ANALYSIS

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Objectives. There is no doubt – continuous education is essential for any healthcare professional to provide relevant, high quality and effective service for the right population at the right time. The field of physiotherapy is changing and undergraduate education so far has provided a limited set of skills and competencies regarding mental health. To fill this gap, the identification of continuous education needs of practising physiotherapists is needed. The objective of this qualitative study was to identify continuous education needs regarding skills and knowledge of physiotherapists to provide effective physiotherapy service for people with mental health problems.

Materials and Methods. An online survey was distributed to the members of Latvian Association of Physiotherapists via email. The survey contained three open-ended questions asking respondents’ opinions about their perceived role of physiotherapy in mental health, their perceived needs for training of specific skills and knowledge. The collected data was analysed by the research team according to thematic analysis principles by Braun & Clarke (2006). Each answer was initially coded either word by word or line by line. The codes were compiled in subcategories and categories, later to be gathered in common themes. The data was collected from 28.10.2020. until 16.12.2020.

Results. Overall twelve themes were identified. Themes regarding the role of physiotherapy – Expected outcomes, Physiotherapy is action, Limitations of physiotherapy. Themes regarding the necessary knowledge – Physiotherapy methods, Physiotherapists competencies, Cooperation models, Theoretical concepts and Construct and therapy of psyche. Themes regarding the necessary skills – Clinical reasoning, Therapeutic relationships, Interaction and Methods.

Conclusions. Physiotherapists have identified a wide variety of knowledge and skills necessary to master, starting from basic information about mental health conditions and diseases to very specific treatment methods. The topics physiotherapists rate as most prominent are interaction and communication skills, motivation skills and different specific physiotherapy methods

POST COVID-19 VACCINATION INDUCED ACUTE DISSEMINATED ENCEPHALOMYELITIS: CASE REPORT

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Objectives. Objectives: Acute disseminated encephalomyelitis (ADEM) is known as an autoimmune demyelinating disease of the central nervous system, that is commonly triggered by an environmental stimulus (preceding infection or immunization). It is more common vaccination complication in children, but rare in adults. Presentation can be various multifocal neurologic symptoms with encephalopathy and rapid deterioration, that needs hospitalization.

Case report: A 72-year-old male presented to Pauls Stradiņš Clinical University Hospital with progressive letargy, encephalopathy, severe rigidity in all extremities. His body temperature was increased up to 39°. A month and a half before hospitalization (06.04.2021) patient received vaccination from COVID-19 with *Vaxzevria* (previously *AstraZeneca*) vaccine. Two weeks after vaccination patient began to experience cognitive and behavioral changes, and slowing of the movements. Magnetic resonance imaging (MRI) of the brain was performed – patient had multiple signal changes in T2 in cerebellar peduncles, corpus callosum, both cerebral hemispheres, which indicated ADEM. Patient received therapy with Methylprednisolone 1 g for 5 days. Patient had significant improvement already on the next day after initiation of immunosuppressive therapy – increased level of consciousness, decreased rigidity and body temperature. Patient had 3 follow-ups with MRI, where was no evidence on disease progression.

Conclusion: According to the literature, only a minority of ADEM cases are induced by immunization. But current publications' data with our presented case show, that COVID-19 vaccination may induce ADEM in adults as a potential complication. Although rare (only a few cases mentioned), it should be diagnosed as early as possible, as the mortality rate in ADEM patients is up to 12%.

POSTOPERATIVE PAIN MANAGEMENT IN PATIENTS UNDERGOING INTESTINAL OR COLORECTAL SURGERY FOR NON-ONCOLOGICAL DISEASES

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Objectives. Postoperative analgesia is important for rapid recovery thus reducing hospitalization length. Procedure-specific analgesic guidelines for intestinal surgery recommend multimodal individualized therapy. The aim of the study is to investigate the existing postoperative analgesia practice in patients undergoing intestinal or colorectal surgery for non-oncological diseases and its compliance with good analgesia practice protocol in one medical center in different timepoints.

Materials and Methods. This retrospective cross-sectional study included adults (≥ 18 years); hospitalized in Pauls Stradins Clinical University hospital surgery departments in 2018, 2020 undergoing colorectal or intestinal surgery. Exclusion criteria: hospitalization postoperatively in the intensive care unit > 3 days. Drug choice, dosing, route of administration and monitoring were evaluated.

Results. Totally 64 patients match inclusion criteria (36 in 2018 and 28 in 2020). Frequently used analgesics are trimeperidine (85.9%), metamizole (50.0%) and ketorolac (32.8%). Use of multimodal analgesia increases in 2020 from 10 (27.8%) patients in 2018 to 19 (67.9%) along with use of documented unambiguous opioid administration criteria from 10 (32.3%)– 23 (95.8%). Non-recommended intramuscular route and lack of switch to peroral therapy when possible, observed in both years – 86.1% cases in 2018 and 89.3% cases in 2020. Decline in 2020 seen in agranulocytosis monitoring using metamizole for > 3 consecutive days from 16 (84.2%) – 2 (22.2%) patients. Allergies and drug contraindications are addressed when prescribing an analgesic in 35 (97.2%) in 2018 and 28 (100%) patients in 2020. The maximum permissible doses not exceeded, 2 or more non-steroidal anti-inflammatory drugs not combined for all patients, however pain score was not properly documented in any patient using it only regarding opioid administration.

Conclusions. Multimodal analgesia is partially applied, often using solely trimeperidine. Underutilized are the uses of pain score and peroral drug administration favoring parenteral, even intramuscular route. Although therapy is safe regarding drug contraindications and prescribed doses, metamizole specific monitoring is deficient.

PREGNANCY-RELATED ABDOMINAL WALL NEUROPATHY

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Objectives. Anterior cutaneous nerve entrapment syndrome (ACNES) is a hitherto unrecognised and undertreated cause of abdominal pain in pregnancy. This syndrome is characterized by the entrapment of the cutaneous branches of the lower thoracoabdominal intercostal nerves at the lateral border of the rectus abdominis muscle, which causes severe, often refractory, chronic pain.

This case report aims to identify the possible therapeutic strategies for the management of the syndrome.

A 36-year-old woman at a 28-week gestation presented with a recurrence of pinpoint left upper abdominal wall pain. She had been diagnosed with an anterior cutaneous nerve entrapment syndrome (ACNES) during her first pregnancy at a similar gestational age. It was made worse in a seated position and relieved somewhat when standing or supine. The pain during that pregnancy resolved immediately and completely following normal spontaneous vaginal delivery, however, the pain was worse with this presenting pregnancy.

Normal laboratory findings with no indication of inflammation or infection, and in the absence of any surgical cause of pain

She underwent an ultrasound-guided block of the area around the responsible nerve in the rectus sheath nerve block with 5 mL of 1% lidocaine and 8 mg dexamethasone. The injection relieved her pain immediately and completely, thus confirming the diagnosis of ACNES.

Anterior cutaneous nerve entrapment syndrome is an under-recognised and underdiagnosed cause of abdominal wall pain with pregnancy as an established risk factor. This case demonstrates ACNES with pregnancy being primary aetiology due to mechanical changes of the gravid abdominal wall.

PREPARING THE RESEARCH TOOL (HARDSHIP QUESTIONNAIRE) FOR USE IN LATVIA

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Objectives. Many population-based studies use different methodologies, that influence conclusions and make data comparison difficult. As part of the Lifting The Burden and Global Campaign against Headache, which operates in official relations with the WHO, the world's leading headache researchers have developed recommendations for conducting epidemiological headache research, and a global headache questionnaire has been designed: Headache-Attributed Restriction, Disability, Social Handicap, and Impaired Participation (HARDSHIP). It has been used to assess the epidemiology of primary headaches in 8 countries around the world. It is necessary to carry out local adaptation and validation of the internationally used tool.

Materials and Methods. The validation of the questionnaire was performed in accordance with Lifting The Burden recommendations:

1. The permission for translation into the Latvian and Russian languages of the questionnaire was obtained from one of the authors.
2. Two independent bilingual residents of Latvia whose native language was Latvian or Russian (headache expert and professional translator) translated the questionnaire. Both teams analyzed and developed one common version in each language. Next, the edited versions were back-translated by a professional interpreter into the English language.
3. The translated material was conceptually compared with the original material.
4. Face-to-face interviews of 15 headache patients in Latvian and Russian were performed by a headache specialist. During the interview, the patient was asked to speak out if some question was incomprehensible.

Results. A reliable and internationally recognized tool was obtained for the planned headache epidemiology study in Latvia. The process took 12 months of time.

Face-to-Face interviews help to train the interviewer creating a hands-on experience for further successful research conduction.

Conclusions. The process of translation and adaptation is complex and time-consuming. The favorable development of the process was facilitated by the available guidelines for adaptation of the Lifting The Burden materials, as well as the excellent mutual cooperation of the Latvian headache specialist team.

PREVALENCE AND ASSOCIATED SOCIO-DEMOGRAPHIC FACTORS OF SUICIDAL BEHAVIOUR IN GENERAL POPULATION OF LATVIA

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Objectives. To determine the prevalence of any type of suicidal behaviour and associated socio-demographic factors among the general population of Latvia.

Materials and Methods. The study was conducted in 2019 and 2020 on a representative sample of Latvian adult population, selected by a stratified random sampling method. The Mini-International Neuropsychiatric Interview (MINI; version 7.0.2) was used to assess suicidal behaviour, and specifically designed questionnaire was used for obtaining the socio-demographic data. All the interviews were conducted by the professional and trained interviewers in the households of respondents. Binary logistic regression was applied during the analysis.

Results. The final sample included 2687 respondents. The point prevalence of any type of suicidal behaviour (including suicidal ideation, plan, and attempts) was 10.6% (n = 285). After adjustment for all independent sociodemographic factors, higher odds of any type of suicidal behaviour were found in respondents with lower education: unfinished primary education (vs. higher education, aOR 3.1, p = 0.003) and primary education (vs. higher education, aOR 1.6, p = 0.04). Higher odds were also detected in those living in capital city Riga (vs. living in smaller Latvian towns, aOR 1.5, p = 0.01), as well as in unmarried respondents (vs. married/cohabiting, aOR 1.8, p < 0.001) and those who are living separately or divorced (vs. married/cohabiting, aOR 1.6, p = 0.007).

Conclusions. In the process of developing an algorithm for a comprehensive suicide screening program attention should be paid to the socio-demographic groups with higher odds of suicidal behaviour: people with lower education, unmarried, divorced and people living separately from their partners, as well as people living in the capital city.

PREVALENCE AND RISK FACTORS OF SUICIDAL IDEATION OF HEALTH CARE WORKERS DURING THE FIRST EMERGENCY SITUATION OF COVID-19 IN LATVIA

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Objectives. Health care workers (HCW) during COVID-19 pandemic are exposed to different personal, social, and occupational risk factors which can lead to mental health problems, including risk of developing suicidal ideation. The aim of this study was to assess the prevalence and risk factors of suicidal ideation of health care workers during the first emergency situation of COVID-19 in Latvia.

Materials and Methods. A quantitative cross-sectional study in the population of HCW in Latvia was made in April–June 2020. In the study 844 HCW participated. Symptoms of depression were assessed using the Patient Health Questionnaire–9 (PHQ–9) scale, suicidal ideation was measured with item 9 of the PHQ–9. Data were analysed using SPSS 25.0 using Pearson’s Chi-Square tests.

Results. From 844 HCW 710 (84.1%) were women. Age median for all participants – 40 (IQR 29–54).

Depression was found in 209 (24.7%) participants, 132 (15.6%) presented with moderate, 55 (6.5%) – moderately severe and 22 (2.6%) – severe depression symptoms. 85 (10.0%) HCW had suicidal ideation, of whom 26 (30.6%) presented with moderate, 24 (28.2%) – moderately severe and 15 (17.6%) – severe depression symptoms.

There is a statistically significant association between severity of depression and suicidal ideation ($p < 0.001$). There is a statistically significant association between workplace and suicidal ideation – HCW who work in emergency medical services and family medicine practices have suicidal ideation more often than in those who work in hospital inpatient department ($p < 0.001$).

There was no statistically significant association between gender, age, work experience, working hours, and contact with COVID-19 patients and suicidal ideation in HCW, accordingly $p = 0.760$; $p = 0.560$; $p = 0.313$; $p = 0.065$; $p = 0.771$.

Conclusions. Suicidal ideation was found in 85 (10.0%) HCW. Greater severity of depression, working in emergency medical services and family medicine practices are risk factors for developing suicidal ideation in HCW.

PREVALENCE OF NEUROGENIC OROPHARYNGEAL DYSPHAGIA AND MALNUTRITION IN HEALTHCARE INSTITUTIONS

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Objectives. To determine prevalence of neurogenic oropharyngeal dysphagia (OD) and malnutrition in healthcare institutions.

Materials and Methods. Cross-sectional study was conducted at Riga East University Hospital Neurology and Neurosurgery clinic and Rehabilitation clinic, Daugavpils Regional Hospital and National Rehabilitation Centre “Vaivari” Neurorehabilitation ward. Study sample consisted of adult neurological inpatients who were hemodynamically stable and signed informed consent form. Intubated patients and patients with Glasgow Coma Scale score ≤ 8 points were excluded. OD was assessed with *Standardized Swallowing Assessment* and *Functional Oral Intake Scale (FOIS)*. Malnutrition was determined according to *GLIM criteria*. Descriptive statistical analysis was performed, calculating median and average values, range, and proportions.

Results. Study sample consisted of 133 patients – 62 from hospitals and 71 from rehabilitation centres. 47% were woman and 53% – men. Median age was 63 years (range 20–94). Majority of patients were diagnosed with cerebral infarction – 61 patient, or sequelae of cerebral infarction – 26 patients. Other diagnoses included epilepsy, traumatic or nontraumatic intracranial hematoma, brain neoplasm, neurodegenerative disease or other. Results illustrated that prevalence of OD in study sample was 26% and malnutrition – 13%. According to *FOIS*, oral intake level for patients ranged from Level 2 (Tube dependent with minimal attempts of food or liquid) to Level 7 (Total oral diet with no restriction). Average oral intake level was 6 (Total oral diet with multiple consistencies without special preparation, but with specific food limitations).

Conclusions. Results obtained regarding OD prevalence in Latvian healthcare institutions are similar to prevalence in other European countries and Australia. However, malnutrition prevalence in Latvia might be higher, based on scientific trials conducted by other authors globally. Potential underdiagnosis of malnutrition in this study might be explained by insufficient sensitivity of the chosen malnutrition assessment tools. *FOIS* levels indicate that patients with OD are most often prescribed oral diet with some restrictions.

PSYCHOSOCIAL HAZARDS AND PREVENTATIVE MEASURES FOR MENTAL HEALTH OF EMPLOYEES IN HOSPITALS IN LATVIA

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Objectives. Health care professionals are subjected to workplace stressors that negatively impacts their health. Some workplace hazards like exposure to trauma are inevitable. To protect workers from negative consequences such as depression, anxiety and burnout it is essential to identify and then moderate factors that are malleable. The aim of this study was to identify what work environment factors predict burnout, depression and anxiety symptoms in hospital staff and what factors moderate risks.

Materials and Methods. Employees (medical staff, administration, support staff) from 30 hospitals in Latvia were invited to complete online questionnaires: a *Copenhagen Psychosocial Questionnaire- COPSQ III*, (Llorens, et al., 2019)), a *Patient health questionnaire: PHQ-2*, *Generalized anxiety disorder scale: GAD-7* and a *Burnout assessment tool_ BAT* and demographic questions. Two invitations gave a response rate of approx. 40%. A total of 4756 participants are included in the analyses (87% women, 13% men, aver. age 45). Data was analysed in SPSS by performing multiple linear regression, moderation analyses.

Results. Feedback from the questionnaires indicates that mental health is significantly related to all psychosocial factors, no significant differences for gender and age. Organisation factors best predict burnout ($r^2 = 0.43^*$), but also significantly predict depression ($r^2 = 0.26^*$), and anxiety symptoms ($r^2 = 0.27^*$). The strongest predictors of mental health symptoms in hospital employees were a) an excessive and emotionally demanding workload that interfered with home life, b) insufficient resources for completing duties, and c) workplace bullying and conflicts. Strongest protective factor-supportive relationships with colleagues: it moderates relationships between emotional load and burnout($b = 0.01$, $t = 3.35^*$)/depression($b = 0.03$, $t = 3.22^*$)/anxiety ($b = 0.02$, $t = 3.02^*$) as well as other major stress factor excessive workload. Support from direct manager moderates relationships between risks and mental health too.

* $p < 0.005$

Conclusions. The study contributes to the understanding of job demands-support-control theoretical model by confirming that supportive relationships with colleagues and manager moderate the negative effects of workplace hazards.

QUALITY OF LIFE AND ITS ASSOCIATION WITH DURATION OF ILLNESS, NUMBER OF REHOSPITALISATIONS, SOCIODEMOGRAPHIC CHARACTERISTICS AND PRESENCE OF SOMATIC COMORBIDITIES AMONG PATIENTS WITH SCHIZOPHRENIA

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Objectives. to evaluate the quality of life in patients with schizophrenia using self-assessment quality of life questionnaires depending on the duration of the disease, the number of rehospitalizations, sociodemographic characteristics and somatic comorbidities.

Materials and Methods. a hospital based, cross-sectional study was performed among all patients with schizophrenia who agreed to participate, in period 01.07.2022.-16.11.2022. Socio-demographic and clinical data, shortened version of the World Health Organization's self-assessment quality of life questionnaire [WHOQOL-BREF] (consisting of 26 questions, including 4 domains (D): D1-physical health, D2-psychological, D3-social and D4-environmental factors) and visual analogue scale were used in this study.

Results. 60 patients with diagnosed schizophrenia participated in the study (50% women) within average age 43.35years [SD14.615]. The somatic comorbidities had 26.67% [n = 16] participants. The average number of hospitalizations due to schizophrenia were 13.13 times[SD14.815]. 6.7% of participants rated quality of life as very good, 26.7% as good, 51.7% as neither poor nor good, 13.3% as poor, 1.7% as very poor. Non-parametric tests showed a positive relationship between somatic illness and higher WHOQOL-BREF in D1[p = 0.034] and D3[p = 0.048], there was no significant influence of confounding factors -gender, education, marital status, employment, place of residence, disability, substance abuse. Spearman's correlation did not reveal a relationship between the number of rehospitalizations and WHOQOL-BREF. Statistically significant correlation was found between the duration of the disease and the WHOQOL-BREF D1 0.251[p = 0.027]. Statistically significant correlation was found between D4 and income level 0.286[p = 0.013] and income level and visual analogue scale 0.302[p = 0.009].

Conclusions. Patients with lower income levels have lower quality of life. Self-assessments in physical health and social relationship were higher in patients with somatic comorbidities. Patients with longer duration of schizophrenia have better physical health self-assessments. This data could be explained with personality changes and decreased critical attitude in assessment of functioning level, in patients with schizophrenia. Further investigation is required.

RADIOLOGICAL EVALUATION OF NEUROVASCULAR CONFLICT IN TRIGEMINAL NEURALGIA PATIENTS WITH HIGH-RESOLUTION MRI: SMALL CASE SERIES

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Objectives. Trigeminal neuralgia is a condition characterized by neuropathic pain that occurs in the sensory supply region of the trigeminal nerve. The common etiology of trigeminal neuralgia is vascular compression on the trigeminal nerve root, commonly known as neurovascular conflict (NVC). Although trigeminal neuralgia is a clinical diagnosis, radiological examination, preferably MRI, is used for further evaluation of structural etiology and classification.

Patient A: a 77-year-old male, diagnosed with trigeminal neuralgia, presenting with severe electric-like pain. Pharmacotherapy provided no relief. Primary MRI scan had no specific signs of NVC. Gasserian ganglion block was performed after which symptoms decreased for 6 months. Repeated blockade was performed with no significant clinical effect. A second MRI scan, including additional high-resolution sequences, showed a vessel near the proximal part of the left trigeminal nerve. A retrosigmoid craniotomy and microvascular decompression was performed. NVC was confirmed during surgery.

Patient B: a 58-year-old female, diagnosed with trigeminal neuralgia, presenting with severe shock-like pain. Carbamazepine treatment was effective, with effectiveness decreasing over time. On primary MRI there were no signs of NVC. Second MRI scan with additional sequences did not prove or exclude the diagnosis of NVC. Because of persistent symptoms a retrosigmoid craniotomy and microvascular decompression were performed. NVC was confirmed during surgery.

Cases of 2 patients diagnosed with trigeminal neuralgia and severe facial pain for more than 5 years with ineffective pharmacotherapy. Primary MRI scans without specific signs of NVC. Radiological evidence of NVC was found on additional high-resolution MRI scans. During neurosurgery, NVC was confirmed. The procedure was successful in both patients.

Conclusions. The most precise implements available for detection of NVC are high-resolution, T2W MRI, 3D MRA sequences. Systemic approach of evaluation and application of recommended criteria is a way to increase diagnostic accuracy of NVC.

RELATIONSHIP BETWEEN BRAIN ATROPHY AND MOTOR RESERVE IN OLDER ADULTS

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Objectives. Aging is a major risk factor for neurodegenerative diseases. Brain atrophy is strongly associated with cognitive decline that could progress further to dementia. Total physical activity is positively associated with brain volume and cognition in older adults; however, there is still a research gap considering the association between the life-long physical activity or motor reserve and brain health in older adults. This study aimed to identify associations between motor reserve and brain atrophy in a sample non-demented older adult.

Materials and Methods. 55 practically healthy older adults participated in the study. All participants underwent a detailed assessment of their lifestyle, as well as structural magnetic resonance. Visual rating scales were used to grade the level of brain atrophy. Social Determinants of Health Behaviors questionnaire (FINBALT) was performed to obtain physical activity data and a motor reserve coefficient was created.

Results. There was a negative significant correlation between the motor reserve score and parietal atrophy in the right and left hemisphere, the total parietal atrophy index, the entorhinal cortex atrophy in the right and left hemisphere, the total entorhinal cortex atrophy index, and frontotemporal atrophy in the left hemisphere. Mann-Whitney U test revealed that only left hemisphere and total ERICA scores significantly differed across groups, with higher motor reserve group showing lesser brain atrophy ($U = 233$, $z = -2.262$, $p < 0.05$ and $U = 246$, $z = -1.895$, $p \leq 0.05$, accordingly).

Conclusions. Our study indicated that lifelong participation in physical activity is associated with a lower degree of brain atrophy in the parietal regions, the entorhinal cortex, and the left frontotemporal hemisphere. Promoting participation in activities may be beneficial for attenuating age-related parietal, entorhinal and frontotemporal atrophy and for preventing dementia.

RELATIONSHIP BETWEEN COGNITIVE RESERVE AND TEMPO-PARIETAL CORTICAL REGIONS IN OLDER ADULTS

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Objectives. The World Health Organization predicts a significant increase in the aged population by 2050. With age being among the main risk factors for dementia, studies on methods improving the quality of life in the elderly are needed. Cognitive reserve has been found to be effective in both – delaying cognitive decline and slowing the rate of brain atrophy. The temporal and parietal regions have been found to be sensitive to ageing and dementia.

Materials and Methods. 58 older Latvian adults aged 65–85 years ($M = 71.83$, $SD = 5.016$, 20.7% male) were included in the study. Cognitive reserve was assessed using the Cognitive Reserve Index questionnaire (Nucci et al., 2012), while structural MRI data were obtained using a Siemens 1.5 Tesla Avanto MRI scanner (Siemens, Erlangen, Germany). Data were further processed using Freesurfer 7.2. software and DKT atlas was applied for regional mapping. Hierarchical analysis was conducted, controlling for age and estimated intracranial volume.

Results. After controlling for age and eTIV, cognitive reserve statistically significantly predicted the volume of the left hemisphere middle temporal gyrus, explaining 6.3% of the variation ($R^2 = 0.396$, $\Delta R^2 = 0.063$, $F(1, 54) = 5.656$, $p = 0.021$) and 12% of the inferior parietal lobule volume variation ($R^2 = 0.465$, $\Delta R^2 = 0.120$, $F(1, 54) = 12.107$, $p = 0.001$). No other statistically significant associations were found.

Conclusions. The results of the study indicate that higher cognitive reserve is associated with larger volume in the left hemisphere middle temporal gyrus and the inferior parietal lobule. Further studies should include measures of functional connectivity to better understand the relationship between cortical regions and cognitive reserve.

RELATIONSHIP BETWEEN INFORMATION SOURCES AND PERCEIVED RISK PREDICTORS ON PROTECTIVE BEHAVIOUR IN ADULTS WITH TYPE 1 DIABETES DURING THE COVID-19 PANDEMIC

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Objectives. The aim of this study is to investigate how information sources moderate the relationship between predictive factors of protective behavior and perceived risk and how the length of the diabetes mediates the connection between these factors in adult with type 1 diabetes during the COVID-19 pandemic. Research of quantitative design was developed, its theoretical framework is the Protection Motivation Theory. The research questions are: Is the instruments Cronbach's α within norm? What are the relationships between perceived risk predictors and protective behavior during the COVID-19 pandemic in adults with type 1 diabetes? To what extent do information sources moderate this relationship? To what extent does the duration of the disease mediate this relationship?

Materials and Methods. Sample size of the pilot study: ($N = 40$), in the age group from 18 to 61 years. The sample size of the study: with type 1 diabetes ($N = 103$, $n = 68$ women and $n = 35$ men), in the age group from 18 to 70 years. Instrument: Protective Behavior Survey for Adults during COVID-19, which was combined from two instruments.

Results. The protective behavior survey in adults during COVID-19 is within the norm ($\alpha = 0.89$; $CVI = 0.98$). There is a statistically significant association between perceived risk factors and protective behavior ($r = 0.56$, $p < 0.001$). Sources of information statistically insignificantly moderate this relationship ($R = -0.06$; $\beta = -0.33$; $p = 0.67$). Practical significance of the obtained results in proposals for further research related to the research topic.

Conclusions. Adults with type 1 diabetes, when evaluating the perceived risk to their health, feel motivated to perform protective behavior, form assessments of perceived risk predictors and therefore perform protective behaviors based on perceived sources of information, even if they do not directly affect individuals.

RENDU-OSLER-WEBER SYNDROME: CASE SERIES

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Objectives. Rendu-Osler-Weber disease or Hereditary Hemorrhagic Telangiectasia, is rare dominant autosomal disease characterized by the presence of multiple telangiectasia in skin and mucus, associated with arteriovenous malformations of various organ including lungs, gastrointestinal system and brain.

There are two clinical cases, a 53-year-old man and a 32-year-old woman, who were acutely hospitalized in the emergency department. Woman complained about a headache and fever. She had a history of spontaneous subarachnoid hemorrhage. The patient's father died at the age of 23 from a hemorrhagic stroke. On neurological examination, the patient has only positive meningeal symptoms. Man complained about coordination disturbances and general weakness and denied having a fever. On neurological examination the patient was unstable in the Romberg posture and bilateral ataxia was observed. In computer tomography both patients were found to have abnormal masses in the brain, most likely a tumor. The patient's condition worsened rapidly in the hospital, a head computer tomography was performed, where diffuse cerebral edema was visualized, emergency ventriculostomies were performed. When the patient's condition stabilized, osteoplasty trepanation was performed, biopsy was taken. In the biopsy, there was no convincing data about a neoplastic process. After examination masses turned out to be brain abscesses. Patients underwent computer tomography angiography of the lungs, arteriovenous fistulas were visualized. In both patients, it was decided to perform endovascular embolization of the pulmonary arteriovenous fistula. After the procedure, the general condition of the patients improved. The findings indicated that the patients most likely have Hereditary Hemorrhagic Telangiectasia. Syndrome was genetically confirmed for the woman.

With suspicion of Hereditary Hemorrhagic Telangiectasia, timely investigation, including computed tomography angiography of the lungs, is important to initiate timely treatment and improve outcome. It is important to consider that a brain abscess is one of the first signs of a pulmonary arteriovenous fistula.

RESILIENCE AND ILLNESS DENIAL AS PREDICTING FACTORS OF ADHERENT BEHAVIOUR FOR PATIENTS WITH CHRONIC ILLNESSES IN PRIMARY CARE

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Objectives. The aim of the study was to find out how resilience and illness denial predicts adherent behavior in patients with chronic illnesses in primary health care. Low adherence in patients with chronic illnesses increases the risk of rehospitalization, and demands more complicated treatment, and higher expenses. Increases the risk of disability and premature death.

Materials and Methods. The sample of 202 respondents in Latvia (N = 202), 73% were females (n = 147) in the age group from 22 to 65 years old (M = 53.40; SD = 11.08) with diagnosed chronic illness. Participants filled sociodemographic data questionnaire – gender, age, and diagnosis. Connor–Davidson Resilience Scale (CD–RISC–25, Connor & Davidson, 2003), adaptation in Latvian done by Skaldere-Darmudasa & Sudraba, 2021, ($\alpha = 0.89$). Scale of 25 items, each rated in 5–point Likert's scale (0–4), with higher scores reflecting greater resilience. Illness Denial Questionnaire-Short Form (IDQ-SF, Rossi Ferrario et al., 2019) – scale of eight items ($\alpha = 0.76$) with dichotomous categories yes/no. Adherent behavior questionnaire, ($\alpha = 0.75$). Nine item measure assessing adherent behavior including intake of medication, healthy lifestyle, and health monitoring. Items are rated in 4–point Likert scale. The measure was created within this study.

Results. There are statistically significant moderate negative correlations ($r_s = -0.41$, $p < 0.001$) between resilience and illness denial. Statistically significant weak correlation between resilience and adherent behavior, and illness denial and adherent behavior in patients with chronic illness.

Conclusions. The result of this study shows a tendency that patients with chronic illness and higher resilience use less denial according to their chronic illness and use more adherent behavior. Higher denial points to less adherent behavior which means less following doctor's and specialist's recommendations about intake of medication, physical activities, diet, and rest.

REVIEW OF A PLASMA EXCHANGE PROCEDURE IN DEPARTMENT OF NEUROLOGY AT PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL IN 2022

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Objectives. Plasma exchange procedure (PEX) is a therapeutic intervention involving extracorporeal removal, return, or exchange of blood plasma or components. PEX results in a filtered plasma product that is used for the treatment of numerous diseases including central nervous system (CNS) and peripheral nervous system (PNS) pathologies. The aim of this study was to determine indications, analyse efficacy and side effects during PEX in Department of Neurology at Pauls Stradiņš Clinical University Hospital (PSCUH) in 2022.

Materials and Methods. Retrospective analysis of patients who received PEX procedure in Department of Neurology at PSCUH from 01.01.2022. to 31.12.2022. We analysed patient files and daily recordings, evaluating indications for PEX treatment, clinical outcome, and experienced side-effects.

Results. Totally 15 patients were included in the study – 8 men and 7 women. The mean age of patients was 57 ± 12 years. 9 patients (60.0%) received PEX procedures during acute hospitalization, 6 patients (40.0%) – during planned hospitalization. 1 patient received PEX because of CNS disorder (autoimmune encephalitis), but 14 patients (93.3%) were treated with PEX because of PNS disease – 7 patients (46.7%) had myasthenia gravis, 2 patients – acute polyradiculoneuritis, 2 patients – chronic inflammatory demyelinating polyneuropathy, 1 patient – multifocal motor neuropathy, 2 patients – rapidly progressive demyelinating polyneuropathy. 4 patients received PEX during previous hospitalizations. Patient reevaluation after PEX course showed improvement of neurological symptoms in 14 patients (93.22%). 4 patients had PEX related complications – 2 patients had allergic reaction to fresh frozen plasma, 2 patients had central venous catheter-related complications – 1 patient had catheter thrombosis and pulmonary embolism, 1 patient developed catheter-related infection and sepsis.

Conclusions. PEX is an effective therapeutic intervention used for treatment of both CNS and PNS pathology. Our experience shows that majority of patients improved on PEX. However, careful patient selection should be performed because of potential life-threatening treatment-related complications.

RISK OF SLEEP APNOEA IN CEREBROVASCULAR PATIENTS

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Objectives. Obstructive sleep apnoea (OSA) is more common in patients with cerebrovascular diseases, increasing the risk of complications and worsening the patient's condition. This study analyses the risks of OSA in patients with acute cerebrovascular events as well as the need for routine sleep apnoea screening in post-stroke patients.

Materials and Methods. This is a case control study based on questionnaire among 125 patients in Riga East clinical university hospital from January to March 2022. Of them 55 acute cerebrovascular patients in the case group and 70 in the control group. The collected data were analysed using IBM SPSS Statistics 27.

Results. The study group of 55 participants consisted of 78.2% (N = 43) cerebral infarction, 9.1% (N = 5) cerebral haemorrhage and 12.7 (N = 7) transitory ischaemic attack patients with mean age of 71.13 ± 1.734 years. Mean age in control group was 52.93 ± 2.406 years.

92.7% of Cerebrovascular patients had an increased risk of sleep apnoea, compared to 51.5% in the control group, that is a statistically significant difference $\chi^2(1, N = 121) = 24.4, p < 0.001$. There was a significant difference in STOP BANG scores between case (M = 3.76, SD = 1.19) and control (M = 2.43 SD = 1.37) groups $t(123) = 5.74, p < 0.001$. All OSA risk factors, except family history of OSA, were more common in case group than in the control group. Also a positive correlation between daytime sleepiness and sleep apnoea risk (STOP BANG score) was observed ($r = 0.336, p = 0.012$) in the study group.

Conclusions. Based on STOP BANG score assessment there was a significantly higher obstructive sleep apnoea risk in cerebrovascular patients than in control group. Daytime sleepiness was associated with higher risk for sleep apnoea.

SCALP NERVE BLOCK FOLLOWING CRANIOTOMY AND CRANIECTOMY IN PAEDIATRIC PATIENTS: CONTROLLED RANDOMISED TRIAL

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Objectives. Infiltration of the nerves of the scalp with local anesthetics is widely used in adults for a variety of procedures involving craniotomy. Moderate-to-severe postoperative pain, following craniotomy or craniectomy, has a high incidence in pediatric patients, therefore, in recent years, this method is increasingly introduced in pediatric neurosurgery.

The aim of this study was to evaluate the effect of scalp nerve block (SNB) after craniotomy or craniectomy in pediatric patients.

Materials and Methods. The study includes pediatric patients scheduled for elective craniotomy or craniectomy at Children's Clinical University Hospital (Riga, Latvia) who were randomly assigned to either the control group (i.e. no infiltration) or the SNB group.

Standardized anesthesia and analgesia protocol was used for all patients. SNB was performed with bupivacaine 0.25% at the end of operation.

Postoperative pain assessment was done using FLACC, Wong Baker face, VAS or NRS scores. Rescue analgesia (IV Morphine, 0.1 mg kg⁻¹) was given for a VAS > 5. Pain scores, rescue analgesia times, hours until successful feeding and parent postoperative pain measure (PPPM) scores were recorded. Data analysis was performed using IBM SPSS 27.

Results. A total of 22 children, aged 1 month to 13 years, were enrolled in the study with 11 patients assigned to each group. The SNB compared to the control group showed significantly lower pain scores (mean 1.54, SD 1.33 vs 4.18, SD 1.75, $p < 0.05$) and reduction in rescue medication required (mean 0 vs 0.45, $p < 0.05$) in neurosurgery ward. Time to successful feeding in ICU was significantly shorter (mean 3.0, SD 0.75 vs 6.4, SD 2.2, $p < 0.05$) and PPPM scores were significantly lower in SNB group (mean 4.6, SD 1.3 vs 6.8, SD 1.8, $p < 0.05$). There were no SNB technique or medication caused complications.

Conclusions. SNB using bupivacaine 0.25% resulted in better analgesia, decreased overall postoperative rescue analgesic requirements, earlier successful feeding and better parent satisfaction.

SEQUELAE RATE AFTER TICK-BORNE ENCEPHALITIS IN LATVIA

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Objectives. Tick-borne encephalitis (TBE) is a viral infectious disease affecting the central nervous system in many parts of Europe and Asia. Post-encephalitic syndrome (PES) and sequelae of TBE may cause long-lasting morbidity which often impacts on patients' quality of life. The aim was to evaluate the sequelae rate and severity of PES after TBE in Latvia. To characterize the sequelae after TBE.

Materials and Methods. A preliminary data of a prospective follow-up study of TBE in Latvia in the period from 2018–2022. PES was defined with the presence of ≥ 2 subjective symptoms (headache, memory/concentration disorders, fatigue, arthralgias/myalgias, emotional lability, sleep disorders, dizziness) or with ≥ 1 objective neurological sign (tremor, spinal nerve paresis, hearing loss/tinnitus, vision disturbances) classified as mild, moderate or severe. Karnofsky index, mRankin scale and EQ5DY were calculated to define the influence on the patients' quality of life. Statistical data processing with MS Excel and SPSS.

Results. By the 1st of January 2023 total 16 patients with previous TBE were evaluated after the median time 38.41 month (SD 11.86).

The PES was found in eleven (68.8%) patients, with mild sequelae in ten (90.9%), moderate in one (9.1%) and no severe sequelae. There were ten cases of menigitis (62.7%) and one meningoencephalitis of patients with PES. The most common symptoms/signs of PES were sleep disorders in eight (72.7%), emotional lability in seven (63.6%) and tremor in six (54.5%) patients.

Karnofsky scale (IQR) was 90.0 (70.0–100.0) and 100.0 (90.0–100.0) ($p = 0.067$), mRS (IQR) was 1 (0–2) and 0 (0–0) ($p = 0.01$) in PES and non-PES patients respectively. Quality of life was disturbed in six (54.5%) PES patients concerning EQ5DY scale.

Conclusions. The PES was found in 68.8% patients after TBE. Patients with meningoencephalitis might be more predisposed to PES. Sleep disorders, emotional lability and tremor were the most common sequelae. The PES impacts on patients' quality of life.

SEX-SPECIFIC DIFFERENCES IN ASSOCIATED FACTORS OF DEPRESSIVE SYMPTOMS: POPULATION-BASED STUDY

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Objectives. The study aimed to determine the point prevalence of clinically relevant depressive symptoms among the general adult population of Latvia, and analyze sex-specific associated factors of detected depressive symptoms.

Materials and Methods. The cross-sectional study was conducted on a representative sample of the Latvian adult population ($n = 2687$), selected using a stratified random sampling method. Computer assisted face-to-face interviews were carried out between November 2019 and March 2020 in the households of the respondents. A 9-item self-evaluation scale Patient Health Questionnaire (PHQ-9) with a cut-off score of 10 was used for detecting clinically relevant depressive symptoms. Respondents were also interviewed using the specially developed questionnaire about socio-demographic and health-related information, and possible comorbid alcohol use disorder was assessed using the MINI International Neuropsychiatric Interview (M.I.N.I.). Binary logistic regression was applied to calculate the odds ratios (OR) for the univariate and multivariate logistic analyses.

Results. The point prevalence of depressive symptoms according to the PHQ-9 was 6.4% (95% CI 5.8–7.6). The point prevalence of depressive symptoms was significantly higher among females [7.7% (95% CI 6.4–9.0)], than among males [4.8% (95% CI 4.2–6.7), $p = 0.02$]. After adjustment for all independent variables, being divorced, widowed, or living separately increased the odds of depressive symptoms in males (vs. being married/cohabiting, aOR 2.6, $p = 0.02$). For females, unfinished primary education (vs. higher education, aOR 5.2, $p = 0.001$) and economically inactive status (vs. being employed, aOR 2.0, $p = 0.03$) were strongly associated with depressive symptoms.

Conclusions. The most significant sex-specific factors associated with depressive symptoms among males were being divorced, widowed, or living separately, and for females it was poor education and economic inactivity.

SIX-MONTH FOLLOW-UP AFTER NEW ONSET PSYCHOSIS POTENTIALLY INDUCED BY COVID-19 VACCINE: CASE REPORT

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Objectives. Vaccines are crucial to ending the COVID-19 pandemic. An mRNA-based COVID-19 vaccine can cause mild to moderate side effects. A number of cases of cardiac, gastrointestinal, and psychiatric side effects have been reported as rare side effects associated with the COVID-19 vaccine.

We present a patient's case, who after the second injection of the mRNA-based COVID-19 vaccine, immediately developed anxiety, nonspecific fear, and insomnia as the prodromal phase of psychosis. Starting from the second week, the patient manifested delusions of persecution, delusions of influence, thoughts insertion, and delusional behaviour, culminating in the suicide attempt. The duration of psychosis was eight weeks, and symptom reduction was observed only after the gradual administration of antipsychotics over four weeks. Patient is continuing to use an antipsychotic (olanzapine 10 mg per night) in maintenance phase of treatment.

The investigations of the patient did not support any structural changes of the brain, any severe medical conditions, a neurological abnormality, a confusion or a state of unconsciousness or alterations in laboratory tests. Psychosis due to the use of alcohol or psychoactive substances was excluded. The psychological assessment of the patient demonstrated the endogenous type of thinking, and the patient had schizoid and paranoid personality traits strongly associated with schizophrenia.

This case indicates a strong causal relationship between the mRNA-based COVID-19 vaccine injection and the onset of psychosis. Six months follow up did not reveal any psychotic symptoms. The COVID-19 vaccine could possibly play a trigger role in the development of primary psychosis. Longer-term supporting evidence is needed to estimate the prevalence of psychosis following vaccination with the COVID-19 vaccine.

STRENGTHS AND DIFFICULTIES QUESTIONNAIRE (SDQ) AS A MENTAL HEALTH SCREENING TOOL IN GENERAL AND CLINICAL ADOLESCENT POPULATIONS IN LATVIA

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Objectives. Mental health screening instruments are crucial for measuring the risks of psychopathology both in population mental health studies and in clinical psychiatric settings. Our study aimed to compare the psychometric performance of the self-report version of the Strengths and Difficulties Questionnaire (SDQ) in a community and clinical samples of Latvian adolescents.

Materials and Methods. The population arm of the study was conducted using data from the international Health Behaviour in School-aged Children (HBSC) study year 2017/2018 Latvian database. The analysed sample comprised 4004 11-, 13- and 15-y.o. adolescents. The clinical sample consisted of 207 adolescent outpatients aged 11 to 17 years attending the Children's clinical university hospital, Child psychiatry clinic.

Results. The proportion of girls was higher in the clinical group (60.9% VS 50.4%). The adolescents in the clinical group were slightly older (mean age 13.9 VS 12.9). Adolescents in the clinical group scored significantly higher in emotional, peer problems and hyperactivity sub-scales than adolescents from the general population group, but there were no significant differences between the groups in conduct problems and prosocial behaviour subscales. When adjusted to age and gender, adolescents from the clinical group had 5.4x higher odds of reaching the "abnormality" threshold (above the 90th percentile in the population) in emotional problems, 3.0x in hyperactivity, 2.8x in peer problems and 4.5x in total difficulties. The SDQ subscales reached a higher level of internal consistency in the clinical population, but in both populations, the externalizing subscales (conduct problems, hyperactivity) demonstrated poor to outright unacceptable internal consistency, indicating that the factor structure of the SDQ in the Latvian adolescent population is substantially different from the structure of the scale in the original UK population.

Conclusions. This analysis illustrates the importance of proper psychometric evaluation of the language adaptations of mental health screening tools when applied in public health research and in clinical practice.

TENECTEPLASE IN PATIENTS WITH ACUTE ISCHEMIC STROKE DUE TO LARGE VESSEL OCCLUSION

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Objectives. Recently, a new thrombolytic drug, Tenecteplase, has proved its effectiveness. It is used before thrombectomy in patients with acute ischemic stroke (AIS) due to large vessel occlusion (LVO). Studies show that Tenecteplase is associated with a higher reperfusion rate and better clinical and functional outcomes than Alteplase. This study aims to investigate the functional outcome and the frequency of recanalization before endovascular treatment (EVT) in patients who received thrombolytic therapy with Tenecteplase at Riga East University Hospital (REUH).

Materials and Methods. The study included data from 39 patients admitted to REUH with a diagnosis of AIS due to LAO and receiving thrombolytic therapy with Tenecteplase. Data about neurological symptoms, functional outcome, complications, and recanalization rates were analyzed retrospectively from medical records.

Results. A total of 39 patients received thrombolytic therapy with Tenecteplase (demographic characteristics – mean age 75.1; women 53.8%). At admission NIHSS was (median) 17 (IQR 20–12) and mRS was (median) 5. Thrombectomy was performed in 48.7% (19) of patients. Before EVT, recanalization was observed in 7.7% (3) patients. Due to anatomical features, access difficulties and other reasons, invasive angiography with subsequent thrombectomy was not performed in 43.6% (17) patients. Successful reperfusion (TICI 2b–3) was achieved in 100% (22) of patients. Hemorrhagic transformation was observed in only 2.6% (1) of patients. Fatal outcomes were 10.2% (4). At discharge, NIHSS was (median) 7 (IQR 10–3) and mRS was (median) 4. Good functional outcome (number of patients reaching mRS 0–3 at discharge) reaches 38.5% (15).

Conclusions. In REUH hospitalized patients with AIS due to large vessel occlusion who received thrombolytic therapy with Tenecteplase, recanalization before EVT was observed in 7.7% of patients and a good functional outcome, i.e. mRS 0–3 at the time of discharge reached 38.5% of patients.

TREATMENT CHOICE AND LONG-TERM OUTCOME IN PAEDIATRIC AUTOIMMUNE ENCEPHALITIS

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Objectives. Autoimmune encephalitis (AE) is an important and treatable cause of acute CNS inflammation. Majority children have favourable prognosis with slow recovery, however significant part may have long-term complications. Our study aim was to describe our AE patient cohort received treatment and respective long-term outcome.

Materials and Methods. This was a retrospective study and included Children's Clinical University Hospital patients with diagnosed autoimmune encephalitis (AE) starting from 2014 till 2022. Information about treatment choice and long-term outcome were collected from medical history data system.

Results. In our study group 16 patients were enrolled, annual AE incidence was ranging 0–1.67/100000 children in the analysed study years. Mean age in study group was 8.0 ± 5.6 years 56.2% (n = 9) were males 43.8% (n = 7) females. Mean hospital days stay till diagnosis and treatment initiation was 6.2 ± 5.2 days. Received first-line treatment was: IVIG+IVMP in 43.8% (n = 7), IVMP in 25.0% (n = 4), IVIG in 25.0% (n = 4), or PEX with IVMP (n = 1) or with IVIG+IVMP (n = 1), missing data n = 1. Mean days from first to second line treatment was 18.4 ± 8.7 days. Second-line treatment was initiated in 43.8% (n = 7): rituximab (n = 4), cyclophosphamide (n = 1) or both (n = 2). More than half 62.5% (n = 10) of study group had long term sequels: 4/9 patients in first-line treatment only 6/7 patients in second-line treatment group. Length in days since symptom onset till treatment initiation was not associated with higher probability of long-term complications ($p > 0.05$). Rest of the study group (n = 6) became symptom free in mean 17.7 ± 16.2 days.

Conclusions. Most common first-line treatment was combination of IVIG and IVMP. Almost half of patients needed to receive second-line treatment, most frequent choice was rituximab. More than half of patients had long-term complications. Early second-line treatment initiation may be favorable for children diagnosed with AE.

TRICHEXYPHENIDYL INDUCED PSYCHOSIS IN PATIENT WITH BORDERLINE PERSONALITY DISORDER AND COMORBID ALCOHOL ABUSE DISORDER: CASE REPORT

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Objectives. Anticholinergic medication like trihexyphenidyl is prescribed to treat side effects associated with long-term antipsychotic drug treatment, however, they should not be prescribed as a prophylactic treatment in patients receiving second-generation antipsychotic therapy without indication of extrapyramidal side effects. Patients with borderline personality disorder have an increased risk of substance abuse and have problems with impulse control, mood lability, and self-harming behavior. A borderline personality disorder is also associated with visual and auditory hallucinations. Prescribing anticholinergic medication for patients with borderline personality disorder unnecessarily increases the risk of intentional drug overdose which can result in central anticholinergic symptoms caused by a decrease in cholinergic activity which may present as visual and auditory hallucinations. Distinguishing between signs of anticholinergic drug-induced hallucinations and perception disorders by the illness may be difficult. Presentation with visual and auditory hallucinations without disclosing the abuse of trihexyphenidyl mixed with alcohol may be a cause for misdiagnoses, as in this case the patient was first diagnosed with bipolar disorder and after presenting with symptoms of perceptions disorder – with schizoaffective disorder.

This case report focuses on a patient who has struggled with psychiatric symptoms since childhood, on this admission he presented with acute visual and auditory hallucinations. On later admission, he explained how he uses trihexyphenidyl and alcohol to achieve euphoria, which may have explained the acute psychotic symptoms on the previous admission and may have led to an inappropriate diagnosis of schizoaffective disorder.

USE OF MONOCLONAL ANTIBODIES IN NEUROLOGY IN RIGA EAST UNIVERSITY HOSPITAL GENERAL NEUROLOGY DEPARTMENT

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Objectives. Introduction. *Rituximab*, *ocrelizumab* and *ofatumumab* are chimeric monoclonal antibodies that selectively deplete CD20+ B-cells. Regarding neurological diseases, these agents are reserved as second or last line treatment with *rituximab* not included in any standardized treatment protocols. Studies have shown favorable outcomes in treatment of multiple neurological diseases.

Aim. To analyze the indications, treatment regimen, side effects, efficacy and outcome of monoclonal antibody usage in neurological diseases in the Riga East University Hospital, department of General Neurology.

Materials and Methods. In this retrospective study data were collected from the medical cards of 55 patients treated with monoclonal antibodies from January 2018 to December 2022.

Results. Thirteen patients received *ocrelizumab*, 25 patients received *ofatumumab*, 17 patients received *rituximab*, with diagnosis of multiple sclerosis (40 patients), autoimmune encephalitis (5 patients), chronic autoimmune demyelinating polyneuropathy (4 patients), cerebral vasculitis (2 patients), *myasthenia gravis* (1 patient), idiopathic hypertrophic pachymeningitis (1 patient), MOG antibody associated disease (1 patient) and *Erdheim-Chester* disease (1 patient).

In all cases *ocrelizumab* 600 mg and *rituximab* 1000 mg were administered intravenously, ranging from 1 dose to continuous doses every 6 months. *Ofatumumab* 20 mg was administered subcutaneously every month. All patients received premedication before *ocrelizumab* and *rituximab*. In one case *ocrelizumab* was stopped due to allergic reaction, no other significant side effects were documented.

In 5 cases of aggressive multiple sclerosis *ofatumumab* was started as a first line immunomodulatory therapy, in all other cases monoclonal antibodies were administered after first line treatment failed.

Symptom control was achieved in all chronic disease cases, eminent improvement was documented in four autoimmune encephalitis cases of *rituximab* therapy, and only one case marked no improvement after repeated doses of monoclonal antibody treatment.

Conclusions. Monoclonal antibodies are safely and effectively used in the treatment of neurological diseases, however further research is necessary in this line of treatment.

VAGAL NERVE STIMULATION FOR EPILEPSY – EXPERIENCE OF LATVIA

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Objectives. Vagal nerve stimulation therapy for refractory epilepsy has been used in Latvia in Children's Clinical University Hospital since 2018. The aim of this study was to evaluate the efficacy of vagal nerve stimulation therapy for Latvian patients.

Materials and Methods. All the patients that had their vagal nerve stimulator implanted at Children's Clinical University Hospital during 2018–2021 were included. The data were collected retrospectively from medical records. All of the patients had AspireSR stimulators implanted.

Results. In total, eleven patients had their stimulator implanted, including three (27%) girls. The median age was 9.3 (IQR 6.8–17.2) years at the moment of implantation. All of the patients had been followed-up for at least one year, but nine of them – for at least two years. There was at least 50% reduction of seizure frequency in 5/11 (45%) children, less than 50% reduction of seizure frequency in 3/11 (27%) children, no significant change in seizure frequency in 2/11 (18%) children, some worsening in 1/11 (9%) child after one year follow-up. There was at least 50% reduction of seizure frequency in 5/9 (56%) children, less than 50% reduction of seizure frequency in 1/9 (11%) child, some worsening in 3/9 (33%) children after two years follow-up. There was no significant correlation between the presence of generalized epileptiform activity in baseline electroencephalogram and therapy outcome. The proportion of AutoStim was less than 15% of total stimulation time for most of the patients.

Conclusions. The vagal nerve stimulation has provided good results for a half of Latvian patients so far. The rest might have some benefit from increasing the AutoStim proportion of total stimulation time. Further research is needed to find the best prognostic factors to be used for patient selection.

VALIDITY ASPECTS OF THE 23-ITEM MODIFIED CHECKLIST FOR AUTISM IN TODDLERS (M-CHAT) IN A CLINICAL POPULATION OF LATVIAN CHILDREN

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Objectives. The aim of the study was to investigate the validity aspects of the M-CHAT Latvian version. M-CHAT is a 23-item screening tool for evaluating risk for ASD.

Materials and Methods. A retrospective study was conducted. Patients who visited the outpatient clinic for Pediatric Psychiatry in Children's clinical university hospital between October 2019 and January 2021 with filled out M-CHAT scale were included. Information about age, sex, M-CHAT, ADOS results were collected. ADOS was considered as reference. Data were analysed with IBM SPSS Statistics.

Results. 120 patients were included. 67.5% (N = 81) were boys, 31.5% (N = 39) – girls. Mean age was 34.4 ± 7.8 months. The youngest patient was 14 months old, oldest – 47 months old. Only 30.8% (N = 37) of the toddlers were in the recommended age range for M-CHAT (under 30 months). The mean M-CHAT score was 7.7 (SD = 2.8) in boys and 8.1 (SD = 2.5) in girls, difference was not statistically significant ($p = 0.64$). Only in 1 of the patients the M-CHAT score fell in the low-risk range, 35% (N = 42) scored in the moderate risk range and 64.2% (N = 77) in the high-risk range. Confirmatory ADOS results were available for 31.7% of patients (N = 38). ADOS was positive in 80% of patients in the high-risk M-CHAT group (20 of the 25 patients). The sensitivity of M-CHAT was 74%, and specificity 55%, but the results lacked statistical significance ($p = 0.135$), possibly due to the low number of patients analyzed. The internal consistency of M-CHAT (as measured by the Cronbach's Alpha) was moderate 0.628.

Conclusions. The level of ASD risk as measured by the M-CHAT is very high in clinical help-seeking population. M-CHAT demonstrated acceptable psychometric properties, but more research is needed in larger patient group to establish the clinical utility of the screening instrument in highly psychopathologically saturated clinical populations.

WOMEN'S MENTAL HEALTH DURING THE COVID-19 PANDEMIC – THE WORLD EXPERIENCE AND LATVIAN DATA

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Objectives. Women may experience poorer outcomes with regard to the psychological impact of the COVID-19 pandemic.

Materials and Methods. This presentation will focus on the data that were obtained from the General Population project (COMET-G) that provided data on anxiety and depression from 40 countries. Another part of the presentation will focus on the nationwide representative online study in the general population of Latvia that was a part of the COMET-G. Anxiety and depression was assessed by the State-Trait Anxiety Inventory (STAI-S) and Center for Epidemiologic Studies Depression Scale (CES-D).

Results. In the COMET-G study 50,461 responses were included in the analysis (33,327 females; 17,134 males). Mean difference in STAI-S and CES-D scores between women and men were 3.75 (95% CI 3.10, 4.39; $t = 13.77$, $p < 0.001$) and 2.98 (95% CI 2.44, 3.51; $t = 11.84$, $p < 0.001$). Proportion of women who had an increase in anxiety and depression were 54.08% (95% CI 50.62, 57.51) and 44.37% (95% CI 41.19, 47.57), compared to 43.61% (95% CI 39.85, 47.41) and 36.11% (95% CI 32.91, 39.39) in men with respective odds ratios of 1.53 (95% CI 1.39, 1.68; $p < 0.001$) and 1.37 (95% CI 1.24, 1.51; $p < 0.001$).

In total, 1570 women of the Latvian sample were included in the analysis, of whom 19.6% ($n = 307$) were classified as having anxiety. The odds of having anxiety were higher in women with depression in the past (OR = 2.40), who had fears about one's and about relatives' health due to coronavirus (OR = 2.22 and OR = 1.30, respectively), who were afraid to die due to COVID-19 (OR = 2.11), who had reported changes in suicidal ideation (OR = 1.39), who had a suicide attempt in the past (OR = 1.92), and who had financial concerns (OR = 1.76).

Conclusions. The findings can help develop future strategies for managing psychological support for women who are at risk.

YOUNG WOMAN WITH CHRONIC AUTOIMMUNE DISEASES – FOCAL SEGMENTAL GLOMERULOSCLEROSIS WITH MULTIPLE SCLEROSIS, DIAGNOSTIC AND TREATMENT DIFFICULTIES (LATVIAN EXPERIENCE)

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Objectives. Introduction. Focal segmental glomerulosclerosis (FSGS) is a histologic pattern of glomerular injury that could be mediated by circulating factors (primary FSGS) or caused by variety of pathological conditions (secondary FSGS). Multiple sclerosis (MS) is a chronic demyelinating disease of the central nervous system. About 85% of people with MS are diagnosed with relapsing remitting form, which can progress into a more aggressive form of the disease.

Case description. The patient's first health complaints appeared in adolescence when arterial hypertension and proteinuria was detected. At the end of 2020 patient kidney function was dynamically deteriorating, and nephrotic-range proteinuria was present. In 2021 first kidney biopsy was performed, confirming primary FSGS with diffuse podocyte injury and deposition of C3 and IgM in glomerular capillaries. Therapy with steroids was started, but no respond to treatment was achieved. Immunosuppression therapy was switched to cyclosporin. Proteinuria level decreased, but glomerular filtration rate continued to decline. In 2022 repeated kidney biopsy revealed FSGS with focal podocyte injury and severe arteriosclerosis.

In 2004 patient had an episode with impaired vision in the right eye and in 2017 had coordination disorders. MRI of the central nerve system was performed, and demyelinating lesions of specific localization were found that approved MS. From 2017 to 2022 patient received disease modifying therapy (DMT) with interferon beta-1a. In the 2022 she periodically feels sensory disturbances in the left body side. Now patient is 39 years old, she has stage IV chronic kidney disease and relapsing remitting MS with EDSS 2.0.

Conclusions. The reported case demonstrates two serious chronic diseases in a rare combination. Treatment resistant FSGS is a progressive kidney disease with poor prognosis. Most of specific DMT drugs for MS treatment are nephrotoxic and could worsen the course of the kidney disease therefore adjusting therapy can be difficult.

PLASMA NEUROFILAMENT LIGHT CHAIN LEVEL AND CHARCOT-MARIE-TOOTH DISEASE PROGRESSION: 3-YEAR FOLLOW-UP STUDY

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Keywords. Charcot-Marie-Tooth; Polyneuropathy; Neurofilament light chain; Biomarkers

Objectives. Charcot-Marie-Tooth disease (CMT) is a hereditary, heterogenous, slowly progressive neuropathy. Neurofilaments are major cytoskeletal proteins of neurons which are diffused into the blood when neurons are damaged. A recent study by Millere et al (2021) confirmed that the plasma neurofilament light chain (NfL) concentration is significantly higher in CMT patients than in controls and, in theory, could be used as a potential disease progression marker. Similarly, NfL has been shown to correlate with autoimmune neuropathy disease activity. The aim of this study is to evaluate association between changes in plasma NfL concentration over time and CMT disease progression.

Materials and Methods. 101 CMT patients and 64 controls were enrolled in the original study. Genetic testing was previously performed for all patients. Follow-up evaluation was performed in 73 patients and 28 controls in a 3-year interval. Disease severity assessment included clinical evaluation with CMT Neuropathy Score version 2 (CMTNSv2). Plasma NfL concentration was measured using highly sensitive Single molecule array (Simoa) NfL assay.

Results. There were 30 males and 43 females in CMT group (mean age – 38.0 years), 7 males and 21 female in control group (mean age – 37.8 years) with no significant difference in sex or age between both groups. In both groups overall NfL level increased (median change in NfL = 1.6 pg/mL, $p = 0.012$ in CMT group, and median change in NfL = 0.6 pg/mL, $p = 0.001$ in controls). Analysing the association between 3-year change in plasma NfL and disease severity (median change in CMTNSv2 – 1.0), there was no correlation in the CMT group ($r = 0.228$, $p = 0.052$) or different CMT genetic subtypes.

Conclusions. There was no association between change in NfL over time and disease progression in CMT patients, proving that NfL levels are not suitable as CMT progression biomarker and other biomarkers should be investigated.

DEPRESSION AND ANXIETY IN COVID-19 AND NON-COVID-19 PATIENTS RECEIVING TREATMENT IN A PULMONARY DEPARTMENT OF PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL

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Keywords. COVID-19; Pneumonia; Anxiety; Depression

Objectives. Research conducted during the COVID-19 pandemic suggests that about 45% of COVID-19 patients experience symptoms of depression and about 47% experience anxiety. However, the data regarding these symptoms in acute hospital setting and their prevalence in comparison with other clinical diagnoses is limited. The purpose of this study was to determine the prevalence of depressive and anxiety symptoms in patients of pulmonary department, to analyze the connection between the severity of psychiatric symptoms and levels of leukocytes and inflammatory markers.

Materials and Methods. Study was conducted in Pauls Stradiņš Clinical University Hospital in Riga. Patients aged 18 or older, who were able to sign the informed consent were eligible to participate. The 9-item Patient Health Questionnaire (PHQ-9) and the 7-item Generalized Anxiety Disorder Scale (GAD-7) were used to assess depression and anxiety. Information on clinical diagnosis and levels of leukocytes, procalcitonin, C-reactive protein was collected from medical records.

Results. 51 eligible patients were assessed. 59% (n = 30) of participants experienced symptoms of mild to moderately severe depression and 25% (n = 13) experienced symptoms of mild to severe anxiety. No statistically significant difference was discovered in depression (p = 0.551) and anxiety (p = 0.630) symptom prevalence between patients with COVID-19 and non-COVID-19 pneumonia. There was a negative correlation ($R_s = -0.405$, p = 0.004) between the level of leukocytes and severity of depressive symptoms. No significant correlation was discovered between levels of inflammatory markers and anxiety and depressive symptoms.

Conclusions. 3/5 of patients with pulmonary disease presented depressive symptoms and 1/4 presented anxiety symptoms. COVID-19 patients do not experience higher levels of depression and anxiety in comparison to other pneumonia patients. The levels of leukocytosis and inflammatory markers are not directly connected to more severe anxiety or depressive symptoms. Follow-up assessment is important for pulmonary disease patients in order to prevent depression and anxiety after hospital discharge.

SMALL FIBER NEUROPATHY AND NEUROPATHIC PAIN IN PATIENTS WITH MULTIPLE SCLEROSIS

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Keywords. Multiple sclerosis; Small fiber neuropathy; Quantitative sensory testing

Objectives. Multiple sclerosis (MS) is considered to be a progressive inflammatory disease characterized by demyelination in the central nervous system. Small fiber neuropathy (SFN) is increasingly being recognized in association with different neurological disorders. The relationship between SFN and MS, if any, has yet to be determined. The aim of this study is to determine the prevalence of small fiber neuropathy and neuropathic pain in patients with MS.

Materials and Methods. 49 patients with multiple sclerosis were enrolled in this study. Nerve conduction studies and quantitative sensory testing (QST) were performed in all patients. Expanded disability status scale (EDSS), Total neuropathy score (TNSc), General anxiety disorder-7 (GAD-7) score, DN4 questionnaire results, were obtained additionally.

Results. In our study group 49 patients were enrolled with mean age 39.2 ± 10.9 years, 18 (36.7%) were males and 31 (63.3%) were females. Small fiber damage was detected in 46 (93.9%) patients with MS. Majority of the patients 48 (98%) were diagnosed with relapsing-remitting MS (RRMS). Cerebrospinal form of disease was diagnosed in 45 (91.8%) patients. EDSS was performed in all patients but there was no statistically significant association between the higher scores and small fiber damage prevalence. Four (8.2%) patients had positive answers on DN4 questionnaire and all of them had evidence of small fiber damage. Although no statistically significant association between the DN4 questionnaire results and nerve fiber damage prevalence was found.

Conclusions. According to our study the prevalence of the SFN in multiple sclerosis patients was 93.9% (n = 46). Majority of them 84.7% (n = 42) were diagnosed with asymmetric A delta and C type nerve fiber damage in arms and legs. Although the only statistically significant association was found between the patient's age and SFN presence.

VARIABILITY OF CENTRAL CORNEAL THICKNESS MEASUREMENTS – HEIDELBERG ANTERION, HEIDELBERG SPECTRALIS AND OPTOVUE ANGIOVUE OPTICAL COHERENCE TOMOGRAPHY

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Keywords. Anxiety; Depression; Athletics

Objectives. Anxiety and depression are well-known conditions that very often interfere with daily activities. Sports activities are no exception. It is known that one-third of athletes who actively train and compete are likely to suffer from anxiety and depression. However, there is no sufficient data yet on the number of these athletes in each sport and how these symptoms are related to the performance level of the athletes. In this study, we aimed to investigate the prevalence of anxiety and depressive symptoms and their relationship with athletes' level of performance.

Materials and Methods. 60 competitive Lithuanian track and field athletes were surveyed using an original, where athletes self-reported their personal best performance based on the World Athletics scoring system, and SMHAT-1 questionnaire, in which General Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9) are included. IBM SPSS Statistics 23.0 was used. Pearson correlation was calculated to determine the correlation between the two scale variables, point biserial correlation – between scale and nominal, Spearman correlation – between scale and ordinal variables.

Results. In the GAD-7 and PHQ-9 questionnaires athletes scored 6.633 ± 4.258 points out of 21 and 7.117 ± 5.132 points out of 27, respectively. The analysis showed that 23.3% of the subjects scored moderate or higher levels of anxiety, while 33.3% scored moderate or higher levels of depression. No symptoms of anxiety or depression at all were found in 36.7% and 40% of subjects, respectively. The results of correlations showed that there was no significant relationship between the athletes' performance and the presence and severity of depression or anxiety symptoms ($p > 0.05$).

Conclusions. This study showed that mild to severe symptoms of anxiety and depression are observed in 63.3% and 60% of Lithuanian track and field athletes, respectively. Whatsoever there is no significant relationship between these symptoms and performance level of the athlete.

THE PREVALENCE OF SUSPECTED EATING DISORDERS AND THEIR SYMPTOMS IN LITHUANIAN ATHLETES AND THEIR ASSOCIATION WITH ATHLETIC PERFORMANCE

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Keywords. Eating disorders; Athletics; Track and field

Objectives. Eating disorders are a significant and widespread problem both – in the general population and in athletes. Many studies have been performed on specific populations, such as rowers, figure skaters, or long-distance runners to determine eating disorders. Although the latter are track and field athletes, this group alone does not reflect the prevalence of the problem in athletics. Aim of this study is to determine the prevalence of suspected eating disorders and their related symptoms in Lithuanian athletes and their association with athletic performance.

Materials and Methods. 60 competitive Lithuanian track and field athletes were surveyed using an original questionnaire and SMHAT-1 questionnaire, in which Brief Eating Disorder in Athletes Questionnaire (BEDA-Q) is included. Athletes self-reported their personal best performance based on the World Athletics scoring system used to measure athletes' mastery. Pearson correlation was calculated to determine the correlation between the two scale variables, while point biserial correlation – between scale and nominal variables. The Chi-square test was used to determine the dependence between two nominal variables, Cramer's V test was used to calculate the effect size.

Results. 33.3% of respondents scored above the thresholds for predicting the presence of eating disorders. 25% of respondents had attempted to lose weight during the study, compared with 71.67% of respondents who had done so overall. Predicted eating disorder risk was also moderately positively correlated with depression and anxiety questionnaire scores ($r = 0.55$, $p < 0.001$ and $r = 0.51$, $p < 0.001$ respectively). No statistically significant association was found between athlete performance and predicted risk of eating disorder ($p > 0.05$).

Conclusions. This study found that one-third of the athletes are at risk for an eating disorder and that this pathology is associated with anxiety and depression. The study also found no association between eating disorders and athletic performance.

GENERALIZED ANXIETY SYMPTOMS AMONG HIGH SCHOOL STUDENTS: PREVALENCE, SOCIO- DEMOGRAPHIC AND ACADEMIC FACTORS

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Keywords. Generalized anxiety; High school students

Objectives. Anxiety remains a common and serious issue that frequently appears early in life and can interfere with a person's day-to-day functioning for many years into adulthood. There has been an incline in adolescent anxiety levels after the COVID-19 pandemic, suggesting there should be more focus on this vulnerable group. The aim of this study was to assess the prevalence of generalized anxiety symptoms and associated socio-demographic and academic factors among high school students.

Materials and Methods. A quantitative cross-sectional study in the population of high school students from the city of Ogre, Latvia was conducted in December 2022 (population size 465). Symptoms of anxiety were assessed using General Anxiety Disorder-7 (GAD-7; Cut off point – 10). The paper-format questionnaire was distributed in schools. It included socio-demographic data and questions about changes in the class collective, frequency of school absences, and average grade. Statistical analysis: SPSS.

Results. 360 participants (response rate 77.4%) participated in the study. 58.3% (n = 210) were females, 39.4% (n = 142) were males, and 2.2% (n = 8) identified as another gender. Prevalence of anxiety symptoms was 39.7% (n = 143) and 15% (n = 54) of participants had displayed severe anxiety symptoms. Younger age was associated with more severe anxiety symptoms ($p = 0.012$). More severe symptoms of anxiety were associated with the female gender ($p < 0.001$). No significant association between anxiety and class ($p = 0.077$); changes in the class collective ($p = 0.255$); frequency of school absences ($p = 0.599$) or average grade ($p = 0.118$) was found.

Conclusions. 39.4% of high school students have clinically significant symptoms of anxiety. Younger age and female gender are associated with more severe symptoms of anxiety. Academic factors are not associated with the prevalence and severity of anxiety.

LONELINESS AT SCHOOLS: DETERMINANTS OF LONELINESS AMONG HIGH SCHOOL STUDENTS AND CORRELATION WITH GENERALIZED ANXIETY SYMPTOMS

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Keywords. Loneliness; Anxiety; High school students

Objectives. Loneliness is a growing issue in modern society, especially for individuals entering adolescence. A student's social growth may be hindered by loneliness, which also has an impact on their physical and mental health. The aim of this study was to examine the frequency of loneliness in high school students, the correlation between loneliness and generalized anxiety symptoms, and to assess associated academic and socio-demographic factors for loneliness.

Materials and Methods. A quantitative cross-sectional study was conducted in the city of Ogre in Latvia (population size 465). UCLA Loneliness Scale was used for assessing loneliness levels and General Anxiety Disorder-7 (GAD-7) scale – for assessing anxiety symptoms. The paper-format questionnaire with additional questions about socio-demographic data, the frequency of school absences, changes in the class collective, and average grades was distributed in schools. Statistical analysis: IBM SPSS.

Results. 360 participants (response rate 77.4%;) aged 16–19 years (mean age 16.83 ± 0.829) participated in the study. A moderately high degree of loneliness was observed in 22.8% ($n = 82$) participants, and a high degree was observed in 4.2% ($n = 15$). There was a statistically significant positive moderate correlation ($p < 0.001$; $r = 0.432$) between loneliness and generalized anxiety. There was no significant association between loneliness and age ($p = 0.479$); class ($p = 0.715$); changes in the class collective ($p = 0.060$); frequency of school absences ($p = 0.343$) or average grade ($p = 0.592$). A significant association was found between gender and loneliness – persons who identified as another gender had much higher (37.50%) rates of high loneliness degree, than males (3.52%) and females (3.33%) ($p < 0.001$).

Conclusions. A total of 27% of participants had moderate to high levels of loneliness. Higher loneliness levels were associated with higher anxiety levels. Those who identified as another gender had a higher degree of loneliness.

INTERNET-DELIVERED COGNITIVE BEHAVIORAL THERAPY FOR SOCIAL ANXIETY DISORDER IN FINNISH ROUTINE CARE: EFFECTIVENESS STUDY

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Keywords. iCBT; Cognitive behavioral therapy; Routine care; Social anxiety disorder; Internet; Web-based; Digital health; Mental health

Objectives. Social anxiety disorder (SAD) is characterized by persistent fear of one or more social or performance circumstances in which the individual is exposed to unfamiliar people or to potential criticism by others. For SAD, cognitive-behavioral therapy (CBT) is the first choice treatment, but its accessibility and affordability is limited – a challenge that can be tackled by modern internet-delivered CBT programs. These programs are demonstrably efficacious, but less is known about their effectiveness in routine care. This research aimed to assess whether a new, 7-session iCBT program for SAD nationwide-delivered by Helsinki University Hospital (HUS-iCBT) is effective in routine care.

Materials and Methods. We administered a specialized clinic-delivered, free-of-charge, therapist-supported iCBT for SAD in 1659 physician-referred patients. The completion time was flexible. The symptoms of social anxiety were measured with the Social Phobia Inventory (SPIN, primary outcome). Secondary measures were the Overall Anxiety Severity and Impairment Scale (OASIS) for anxiety and impairment, and the The Patient Health Questionnaire (PHQ-9) for depression.

Results. Patients completed a mean 5.5 (SD 1.80; 78.6%) of 7 sessions, and 54% (896/1659) of patients completed all sessions. The effect size for Intent-to-Treat population for SPIN was large (Cohen $d = 0.88$, 95% CI 0.82–0.94). For completers, effect sizes varied from large to small (Cohen $d = 1.14$, 95% CI 1.06–1.23 for SPIN; Cohen $d = 0.77$, 95% CI 0.69–0.84 for OASIS and Cohen $d = 0.46$, 95% CI 0.39–0.52 for PHQ-9). Non-completers also benefited from the treatment.

Conclusions. The HUS-iCBT for SAD was effective in routine care. More research is needed to compare its real-world effectiveness with that of other treatments and to tailor the design for different patient subgroups.

THE RELATIONSHIP BETWEEN THE VOLUME OF THE HEAD OF THE HIPPOCAMPUS AND WORKING MEMORY IN OLDER ADULTS

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Keywords. Working memory; Head of the hippocampus; Aging; Cognitive function

Objectives. Working memory retains information and is responsible for cognitive tasks. During the aging process, hippocampal atrophy is often present. Similarly, cognitive functions can change, and working memory could deteriorate. The aim of the study was to investigate the relationship between working memory and head of the hippocampus. Obtained structural and functional interaction.

Materials and Methods. 70 patients were included in the cross-sectional study, but applying exclusion criteria resulted in 58 patients aged between 65 to 85 (Mage = 71.83, SD = 5.02, 20.7% men), without self-reported diagnosis of dementia. The study was conducted at Pauls Stradiņš Clinical University Hospital in 2022, and all patients signed consent forms for participation. Cognitive function tests were administered (Woodcock et al, 2001, Paleja, 2006) to evaluate working memory, and structural data of hippocampus were obtained using magnetic resonance imaging (MRI). Data were analyzed with IBM SPSS 28.0.1.1.

Results. A weak positive correlation was observed between the left head of the hippocampus and working memory ($r_s = 0.412$, $p = 0.004$), while an average positive correlation was observed between the same structures on the right side ($r = 0.516$, $p = 0.000$).

Conclusions. It can be concluded that structural measures of the hippocampal head could be associated with working memory performance.

THE IMPACT OF THE COVID-19 PANDEMIC ON PRIMARY HEADACHE DISORDERS WITH A PARTICULAR FOCUS ON MIGRAINE DISORDERS

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Keywords. Migraine; Primary headache disorders; COVID-19; Pandemic; Headache

Objectives. The goal of this research work is to identify “real life” changes of monthly headache days (MHD) and headache intensity of migraineurs during the pandemic, and to evaluate distinct pandemic specific headache-triggers considering the social, economic, and occupational consequences of the COVID-19 Pandemic.

Materials and Methods. This study included 222 migraineurs currently undergoing treatment at the West German Headache Center. The paper-based survey consisted of 37 questions (dichotomic questions, even/uneven Likert scales, Perceived Stress Scale (PSS), open questions) and compared physical, intellectual, psychological, psychosocial, financial, and professional variables before and during the COVID-19 pandemic, with consequent changes of MHD frequency and intensity in our patient collective.

Results. Two thirds of patients experienced consistent and 1/3 of patients an increase in headache days and headache intensity during the Pandemic. The MHD increased significantly from 14.2 ± 10.1 to 15.3 ± 10.0 ($p \leq 0.01$). Significant correlations between an increase in 1:MHD or 2:Headache-Intensity were detected with: Younger age (2:p = 0.016; $r_s = -0.168$), no spouse (1:p = 0.049; $r_s = -0.138$), COVID-19 cases in private environment (1:p = 0.035; $r_s = 0.146$), reduced physical performance (1:p = 0.023; $r_s = -0.161$), temporary (forced) work reduction (1:p = 0.023; $r_s = -0.170$), homeschooling (1:p = 0.013; $r_s = 0.220$), “Home Childcare” (1:p = 0.007; $r_s = 0.240$; 2:p = 0.011; $r_s = 0.227$), fear of own infection (1:p < 0.001; $r_s = 0.267$; 2:p = 0.002; $r_s = 0.217$), fear of infection of others (1:p = 0.042; $r_s = 0.140$), fear of financial hardship (1:p = 0.016; $r_s = 0.170$; 2:p = 0.013; $r_s = 0.177$), fear of loneliness (2:p = 0.005; $r_s = 0.198$), fear of meeting people (1:p < .001; $r_s = 0.248$; 2:p = 0.003; $r_s = 0.205$), feeling of being able to cope well with the pandemic (1:p = 0.024; $r_s = -0.158$), more conflicts with own children (1:p = 0.013; $r_s = 0.216$; 2:p = 0.004; $r_s = 0.251$), PSS (2:p = 0.003; $r_s = 0.222$). Additionally, patients during the second COVID-19 wave demonstrated a significant worsening of migraine headache compared to the first wave.

Conclusions. Beyond the actual infection, the COVID-19 Pandemic negatively affects the lives and disease experiences of migraineurs. Pandemic-specific stress, worries, fears, as well as various physical and psychological factors caused an increase in migraine headaches in our patients. Only the optimistic feeling of being able to cope well with the pandemic correlated positively with a reduction in MHD.

ALEXITHYMIA AND ITS ASSOCIATION WITH ALCOHOL USE DISORDERS AMONG LATVIAN ADULT CITIZENS

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Keywords. Alcohol; Emotions; Disorder; Psychology; Dependence; Alexithymia

Objectives. Alexithymia is a term coined by Sifneos to describe people who have significant trouble describing their feelings or difficulty recognizing, processing, and regulating emotions (R. S. et al., 2021). Alexithymia is common among people who abuse alcohol, yet the mechanisms by which alexithymia exerts its influence remain unclear (L. B. K. et al., 2021). This study analyzes the association between alexithymia and alcohol use disorders among Latvian adult citizens.

Materials and Methods. This ongoing quantitative cross-sectional study was started on November 2022. using anonymous questionnaires, including sociodemographic questions and a translated (to latvian and russian) version of Toronto Alexithymia Scale (TAS-20) and Alcohol Use Disorders Identification Test (AUDIT). All data were coded and entered the Microsoft Excel program and transferred to the statistical analysis program IBM SPSS. Statistical analysis was done using IBM SPSS statistics (Independent Samples Kruskal-Wallis Test, Spearman's rho and Pearson Chi-Square Test). A P-value of < 0.05 was considered significant.

Results. So far, 410 people have responded (309 female and 101 male), with a mean age of 29 ± 9 years. The data represents a statistically significant association between TAS-20 and gender ($p < 0.05$), where alexithymia occurs more often in women (28% vs. 18%). The data show that alexithymia and respondent age have a statistically significant relationship ($P < 0.05$), as well as a negative correlation (correlation coefficient -0.195 , $P < 0.01$). There was no statistically significant association between alexithymia and alcohol dependency ($P > 0.05$). Harmful alcohol consumption was found in 99 respondents, 27 with presenting alexithymia. Alcohol dependence found in 23 respondents from which 10 with alexithymia.

Conclusions. The study results show that alexithymia is found more often in women and in the younger Latvian population. The study should be continued to explore the connection between alexithymia and alcohol dependency. It is necessary to extend harmful alcohol consumption and alcohol dependency groups to more respondents.

SPECIFIC PATTERNS OF DOMESTIC HOMICIDES IN SCHIZOPHRENIA

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Keywords. Schizophrenia; Domestic homicide; Psychiatric disorders

Objectives. Our objective was to identify a specific model of schizophrenia-related domestic homicides by comparing homicide offenders with schizophrenia to an analogous group of domestic homicide offenders diagnosed with other psychiatric disorders.

Materials and Methods. A cross-sectional study was organized at the Rokiskis Psychiatric Hospital in November 2022. We analyzed 21 sociodemographic and psychological parameters of inpatients currently receiving forensic treatment in high secure unit. All information about the patients was gathered from their medical history. There were two groups compared with each other in search of differences. Data analysis was managed with the statistical platform SPSS Statistics, version 26. As our sample was small ($n = 25$) since it is a very specific population, calculations were made using Fisher's Exact Test for possible associations between two groups.

Results. A total of 25 patients were analyzed in the study, all of them were male gender. $N = 13$ were diagnosed with schizophrenia and $n = 12$ with other psychiatric disorders. From 21 variables we found 3 statistically significant differences between our groups – victim's gender ($p = 0.034$), intimate partner as a victim ($p = 0.005$), and planning of crime in advance ($p = 0.027$). There were almost statistically significant differences in alcohol consumption before homicide ($p = 0.053$). In other sociodemographic and psychological values, there were no significantly larger differences.

Conclusions. Our study showed that there are some specific patterns in schizophrenia-related homicide. The victim gender were mostly men, mainly conducting crime without planning it and non of the victim were intimate partners although 7 patients with schizophrenia lived single, non-married, and without any intimate relationship. Perhaps if there is a link between mental illness and specific type of domestic homicide we would be able to gain more precise information about predictive factors based on specific psychiatric disorders. Further research is recommended.

POLYNEUROPATHY IN PATIENTS WITH MULTIPLE SCLEROSIS IN LATVIA

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Keywords. Polyneuropathy; Multiple sclerosis (MS); Peripheral nervous system (PNS)

Objectives. Multiple sclerosis (MS) is a chronic autoimmune disease of the central nervous system (CNS) where combination of demyelination, inflammation, and axonal degeneration results in neurologic disability. Three main types of MS are relapsing-remitting MS (RRMS), secondary progressive MS (SPMS) and primary progressive MS (PPMS). Clinical symptoms vary widely depending on the severity and the location of nerve fiber damage. The aim of the study was to define the prevalence of the polyneuropathy in patients with multiple sclerosis as well as to determine the association with the variable factors that may impact the development of the peripheral nervous system damage.

Materials and Methods. The total number of 70 patients with MS were enrolled in the study. Informed written consent was obtained from all participants before participation in the study. The Total Neuropathy Score (TNSc), Expanded Disability Status Scale (EDSS), neuropathic pain scale (DN4) and generalized Anxiety Disorder Scale-7 (GAD-7) results were obtained. Nerve conduction study was performed to define the polyneuropathy.

Results. 70 patients were enrolled with the mean age 40.57 ± 10.9 years. Polyneuropathy was detected in 10 patients (14.3%) with nerve conduction study method. Majority of the patients were diagnosed with relapsing-remitting MS (RRMS) 94.3% ($n = 66$) and cerebrospinal form of the disease 91.4% ($n = 64$). Average time from the symptoms onset was 7.9 ± 5.6 years. The association between higher TNSc score and polyneuropathy was statistically significant as well as the association between patients' age and polyneuropathy was statistically significant.

Conclusions. Patients with multiple sclerosis have an evidence of peripheral nervous system damage. In our case 14.3% ($n = 10$) of the patients have been diagnosed with polyneuropathy using nerve conduction study method. Our study also shows that higher TNSc scores as well as the patient's age is associated with the presence of polyneuropathy.

DEMENTIA CAREGIVERS' ATTITUDE TOWARDS THEIR WELL-BEING AND QUALITY OF SUPPORT SYSTEMS AND SERVICES

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Keywords. Dementia; Caregivers

Objectives. To assess the experience of dementia caregivers' on their well-being and access of healthcare and social support services.

Materials and Methods. An anonymous survey, consisting of 35 original questions, was conducted from January to May of 2022 at the Hospital of Lithuanian University of Health Sciences Kauno Klinikos. The study included 32 adult respondents, whose relatives were diagnosed with dementia. IBM SPSS 27.0 was used for statistical analysis. Statistical significance – $p < 0.05$.

Results. A total of 25 women and 7 men responded to the survey, with the average age 53.31 (SD = 14.58). Half of the respondents ($n = 16$) declared that they understood what to expect after their relatives were diagnosed with dementia. Caregivers of people with dementia who sought medical care early, before symptoms disrupted their relatives' daily activities, were less likely to report changes in their own lives ($p = 0.005$). Respondents, who claimed excessive bureaucracy in getting necessary information and assistance, declared a lack of assistance in household matters ($p = 0.041$) and a lack of support groups for caregivers ($p = 0.017$). Among relatives who stated a lack of information and coordinated activity, more of them reported a lack of psychological support for the caregiver ($p = 0.018$). The duration of the illness had a significant impact on the caregiver's life ($p = 0.019$) and psychological well-being ($p = 0.029$), with a greater impact being seen in those caring for someone with dementia lasting more than one year. Additionally, for disease lasting one year or less, there were more people who did not seek help from mental health specialists ($p = 0.018$).

Conclusions. The caregivers of people with dementia experienced a significant impact on their life and well-being, especially when the illness lasted over one year. A lack of information and coordinated activity also negatively impacted their experience and access to assistance and support.

PATIENTS' KNOWLEDGE ABOUT EARLY HIP REPLACEMENT SURGERY POSTOPERATIVE PERIOD AND RELATIONSHIP OF KNOWLEDGE WITH POSTOPERATIVE ANXIETY AND DEPRESSION LEVEL

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Keywords. Hip replacement surgery; HADS; Anxiety; Depression

Objectives. Hip joint replacement surgery is mainly performed on patients with osteoarthritis. In severe cases, it helps to get rid of pain and regain mobility. The surgery is tough for patients not only physically, but also emotionally. Many factors, related to the surgery, can cause postoperative anxiety and depression. The research objective is to find out patients' knowledge about the early postoperative period after hip joint replacement and its relationship with postoperative anxiety and depression level.

Materials and Methods. 51 patients after first-time hip replacement surgery participated in a quantitative cross-sectional study. The study was held in the Hospital of Traumatology and Orthopaedics in Riga, Latvia. To evaluate patients' knowledge about early postoperative period, a researcher created, structured survey was used. To evaluate patients' anxiety and depression levels patients were surveyed using Hospital Anxiety and Depression Scale (HADS). To research the relationship Mann-Whitney U and Chi-Square tests were used. Data was analyzed using IBM SPSS Statistics software.

Results. The mean age of participants was 64 (SD \pm 10) years. 44 patients (86.3%) had received the information about early postoperative period before the surgery. Summarizing HADS scale results, 41(80.4%) patient didn't have anxiety, 10 (19.6%) have mild or moderately severe anxiety. 46 (90.2%) didn't have signs of depression, but 5 (9.8%) have various severity signs of depression. Using the Mann-Whitney U Test, a statistically believable difference between patients' knowledge and postoperative anxiety ($U = 158.5$, $p = 0.904$) and depression ($U = 165.5$, $p = 0.758$) level was not found. Similarly, when grouping patients by the severity of anxiety and depression level in Chi-Square test statistically believable correlation between patients' knowledge and group anxiety ($p = 0.495$) and depression ($p = 0.295$) level was not found.

Conclusions. Patients' knowledge about hip joint early postoperative period does not affect the level of postoperative anxiety and depression.

ACUTE DISSEMINATED ENCEPHALOMYELITIS IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL

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Keywords. Acute disseminated encephalomyelitis; Central nervous system; Pediatric neurology

Objectives. Acute disseminated encephalomyelitis (ADEM) is an autoimmune inflammatory disorder of the central nervous system (CNS), which may follow by a previous infection or vaccination. ADEM is a rare disease (ORPHA:83597), however requires rapid diagnosis and treatment initiation since symptoms may rapidly worsen. Usually, ADEM has monophasic disease course.

Materials and Methods. This was a retrospective study and included Children's Clinical University Hospital patients with first diagnosed ADEM starting from 2010 to 2022. Clinical and demographic data were collected from medical history data system.

Results. In our study group 6 patients with ADEM were included with mean age 9.33 ± 4.49 years, ranging from 3 to 15 years. ADEM incidence in the studied years was 0 – 0.53 per 100 000 children. There were 83.3% (n = 5) males and 16.7% (n = 1) female. Presenting symptoms during admission were visual impairment 83.3% (n = 5), ataxia 83.3% (n = 5), headache 66.7% (n = 4), vomiting 50.0% (n = 3), cranial nerve deficits 50.0% (n = 3) and other less frequent. In half (n = 3) of our study group ADEM associated with a previous infection. All patients had typical neuroimaging findings on magnetic resonance imaging. Anti-MOG antibodies in serum were found in two patients. All patients received treatment with intravenous methylprednisolone for five days, followed by complete improvement without long-term neurologic deficits. Three patients had further episode of demyelinating event and were diagnosed with either pediatric onset multiple sclerosis (POMS) (n = 1) or relapsing MOG antibody associated disease (MOGAD) (n = 2).

Conclusions. ADEM is a rare demyelinating disease of the CNS with acute polyfocal neurologic deficits. Majority of ADEM patients are younger than 10 years and predominantly are males. Half of ADEM patients had further demyelinating event and were diagnosed with POMS or MOGAD.

HLA ASSOCIATION IN PARKINSON'S DISEASE PATIENTS IN RIGA EAST UNIVERSITY HOSPITAL "GAIĻEZERS"

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Keywords. Parkinson's disease (PD); HLA-DRB1, DQA1, DQB1 alleles

Objectives. Parkinson's disease (PD) is the second most common neurodegenerative disorder. Neuroinflammation and various molecular mechanisms are involved in the pathogenesis of Parkinson's disease. In recent studies an association between the HLA locus and PD risk has been shown. The aim of the study was to detect HLA alleles in Parkinson's disease patients and their correlation with the risk of developing the disease.

Materials and Methods. A prospective study took place at the Riga East University Hospital "Gaiļezers", Outpatient Department and Department of Neurology and Neurosurgery during the 2019–2020 time period and included 43 patients with sporadic PD. The gene typing method included detection of 12 HLA-DRB1, 7 HLA-DQA1, 11 HLA-DQB1, using specific primers in RSU Joint Laboratory of Clinical Immunology and Immunogenetics. Statistical analysis was performed with SPSS Statistics 28.0 (Chicago, IL, USA).

Results. There were 23 (53.5%) females and 20 (46.5%) males in the PD group. The mean age of the patients was 65.21(SD 8.935) years, and the mean duration of the disease was 7 (4; 11) years. We detected HLA-DRB1 01, 04, 07, 08, 09, 11, 12, 13, 14, 15, 16, 17 alleles, HLA-DQA1 0101, 0102, 0103, 0201, 0301, 0401, 0501, HLA-DQB1 alleles 020102, 0301, 0302, 0303, 0304, 0401, 040102, 0501, 0502, 050204, 060208. We found that PD patients presented higher allele frequencies of HLA-DRB1*04 ($p < 0.001$), HLA-DRB1*07 ($p = 0.044$), DQA1*0103 ($p < 0.001$), DQA1*0201 ($p = 0.025$), DQA1*0301 ($p = 0.002$) and DQB1*0304 ($p = 0.037$) than the healthy controls. Conversely, the HLA-DRB1*01 ($p = 0.025$), DRB1*08 ($p = 0.016$), DQA1*0501 ($p = 0.016$) were found with lower frequency in PD patients compared to healthy controls.

Conclusions. The association between HLA-DRB1*04, HLA-DRB1*07, DQA1*0103, DQA1*0201, DQA1*0301, DQB1*0304 alleles and PD patients indicates the higher risk of developing PD, while HLA-DRB1*01, DRB1*08, DQA1*0501 are associated with a protective role in pathogenesis.

THE CORRELATION BETWEEN SOCIOECONOMIC STATUS AND BURNOUT SYNDROME IN MEDICAL FACULTY STUDENTS

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Keywords. Burnout; Socioeconomic status; Medical students

Objectives. Burnout is a syndrome conceptualized as a result of chronic workplace stress that has not been successfully managed. Medical students face high daily stress. These conditions can cause students to quit their studies, consider other professions and feel anxious. The study aims to evaluate the possibility of a correlation between socioeconomic status and the symptoms of Burnout syndrome among medical students in Latvia.

Materials and Methods. A quantitative cross-sectional study in the population of local medical students of Rīga Stradiņš University and University of Latvia was conducted in November–December 2022. Symptoms of Burnout syndrome (professional efficiency, exhaustion, and cynicism) were assessed using the Maslach Burnout Inventory. Students were asked about socioeconomic status, job status, hours spent at work. The data were collected by non-probability sampling approach in online, analyzed using SPSS–Chi-Square test.

Results. Medical students participated in the study. 84% (N = 199) female, the median age of participants was 23 (IQR = 20–24). 56.8% of students were working and studying, of whom 60.4% of them were working 20–39 h in a week; 23.6% paid for their studies; 64.3% reported general dissatisfaction regarding their financial status. 19.8% (N = 47) students have at least one symptoms of burnout; 35.4% (N = 84) – two symptoms; 27.8% (N = 66) – three. There was a significant association between Burnout symptoms and dissatisfaction with the financial situation ($p = 0.004$), and that correlated with a 40–49 h work week, having 2 jobs, and not paying for their studies ($p = 0.003$, $p = 0.026$, $p = 0.02$).

Conclusions. The study shows that burnout syndrome is correlated with dissatisfaction with financial status. Students who have 3 burnout symptoms and were dissatisfied with their financial status, most likely works 40–49h, work 2 jobs, and don't pay for their studies.

EPIDEMIOLOGY OF STROKE RISK AND ASSOCIATED FACTORS IN LATVIAN POPULATION

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Keywords. Stroke; Risk factors; Stroke risk

Objectives. Stroke is one of the leading causes of death and disability worldwide, with many known risk factors. Risk factors vary between populations. The aim of this study is to investigate the epidemiology of stroke risk and its associated risk factors Latvian population.

Materials and Methods. In this cross-sectional study (October – November 2022), participants completed a questionnaire regarding stroke risk and associated factors, based on Stroke Riskometer. The data was transferred to Microsoft Excel then analysed with IBM SPSS 28.0.

Results. The final sample consisted of 106 respondents (69.81% female) with a median age of 52.50 ± 31.00 years and mean body mass index (BMI) of 26.43 ± 4.96 which is above the norm. The risk factors that increased the risk for stroke are higher systolic blood pressure (median: 130.00 ± 28.00 mmHg), diagnosed cognitive problems/dementia (10.38%), poor memory (27.36%), traumatic brain injury (11.32%), and of course previous stroke or transient ischemic attack (5.66%). Another risk factor is if a biological parent has died from a heart attack before the age of 65, the stroke risk increases along the respondents age. The majority (77.36%) of respondent's drink less than 1 drink a day (or drink occasionally) and eat half the amount of necessary fruits and vegetables a day (56.60%) eating 2–3 servings, both slightly increase stroke risk. The result of stroke risk calculations for 5-year risk had a median of $2.90\% \pm 6.85\%$, and for 10-year risk a median of $4.15\% \pm 14.05\%$, meaning that stroke risk in the tested population is low to intermediate.

Conclusions. As the stroke risk in the tested population is low to intermediate, we still have work to do to get it even lower. The answer to reducing the risk of stroke in the general population could be a comprehensive intervention strategy targeting risk factors.

SLEEP DISORDERS IN COVID-19 SURVIVORS: THEIR CHARACTERISTICS AND IMPACT ON QUALITY OF LIFE

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Keywords. COVID-19; Sleep disorder; Insomnia; Quality of life

Objectives. Many patients are experiencing health-affecting consequences after contracting the COVID-19 infection. Among these consequences sleep disorders are also often noted. The aim of the work was to find out the prevalence of sleep disorders and their relationship with the quality of life in patients treated at the Department of Dangerous Infections of Riga East Clinical University Hospital department “Gailezers” after a COVID-19 infection.

Materials and Methods. After agreeing to participate in the study patients signed the consent form and were assessed three and six months after hospital discharge using internationally validated sleep quality questionnaires – Epworth sleepiness scale (ESS) and Pittsburgh sleep quality index (PSQI), as well as additionally a quality of life measurement was performed using Fatigue severity scale, EuroQol five-dimension five-level questionnaire, EuroQol Visual Analogue Scale, Patient Health Questionnaire. Microsoft Excel 2016 and IBM SPSS Statistics 28.0 programs were used for data analysis.

Results. 33 patients were recruited into the study of whom 30 patients continued to participate in the surveys. Participants of the study were aged between 20 and 89 years – 15 of them were women and 15 were men. During the acute infection period 40% patients had a moderately severe infection and 13% had a severe infection. At the first assessment, sleep disorders were found in 6 (20%) patients. Comparing the data from the first and second surveys, no statistically significant differences were obtained in the data from ESS and PSQI. Analyzing the relationship between PSQI scores and quality of life questionnaires, a correlation was found between the presence of sleep disorders and lower quality of life.

Conclusions. Based on the results, we found that 20% of the patients had sleep disorders which correlates with decreased quality of life. Our results highlight the need for routine sleep quality assessment in post-COVID patients.

PSYCHOMETRIC PROPERTIES OF THE SELF-REPORT AND PARENT-REPORT VERSIONS OF THE STRENGTHS AND DIFFICULTIES QUESTIONNAIRE (SDQ) IN A CLINICAL POPULATION OF LATVIAN ADOLESCENTS

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Keywords. Strengths and difficulties questionnaire; Adolescents; Emotional and behavioural disorders

Objectives. This study aims to investigate the validity, reliability, and factor structure of the self-report and parent-report Strengths and Difficulties questionnaire (SDQ) in a clinical sample of help-seeking adolescents.

Materials and Methods. Research participants were adolescents 11 to 17 years of age, who received outpatient psychiatric treatment at the Children's Clinical University Hospital in Riga, from November 2019 to October 2020. The adolescents and their parents provided screening information prior to their first-time psychiatric appointment, which was part of the usual clinical procedure. The SDQ screening information was subsequently available in the patients' medical records for retrospective analysis.

Results. In total 207 adolescents were included in the study. The internal consistency of the subscales of the SDQ reached sufficient levels (> 0.700) in the Emotional problems and Prosocial behaviours subscales of the self-report SDQ, as well as the Internalizing and Total difficulties scales. In the parent-report SDQ the Hyperactivity and Prosocial behaviour subscales and Externalizing and Total difficulties scales were sufficient (> 0.700). The mean scale scores were significantly higher in the adolescent self-report in Conduct difficulties and Hyperactivity subscales and the Externalizing difficulties scale. Overall, the level of inter-rater reliability as measured by Fleiss multirater kappa statistic showed slight agreement (0.01 to 0.10) for all subscales and scales of the SDQ except the Hyperactivity subscale that displayed poor agreement (< 0.00). The self-report and parent-report versions of the SDQ had substantially different factor structures in the principal component analysis, and both variants did not demonstrate the 5-factor structure of the original UK adolescent population.

Conclusions. Adolescents seem to be better informants regarding the symptoms of internalizing psychopathology, whereas parents are more reliable in reporting signs of externalizing psychopathology. When using the SDQ to screen for mental health difficulties in help-seeking adolescents a multi-informant screening protocol is recommended.

COGNITIVE IMPAIRMENT IN LATE FORM OF NEUROSYPHILIS: A CASE REPORT

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Keywords. Neurosyphilis; Syphilitic dementia; *Treponema pallidum*

Introduction. *Treponema pallidum* is the cause of syphilis that normally invades CNS hours to days after inoculation which can lead to severe neurosyphilis if left untreated. *T. pallidum* invasion of the nervous system can manifest in various symptoms such as meningitis, dementia, stroke, and tabes dorsalis.

Case Description. A 35-year-old woman was admitted to the Psychiatry clinic due to behavioral changes, and psychiatric manifestations. During hospitalization, the patient's condition worsened: behavior and personality impairment progressed, gait, speech, and handwriting changed, episodes of choking while swallowing appeared, impaired sphincter activity, and diffuse alopecia were present. Cognitive functions such as memory, orientation, and concentration declined. Huntington's disease was excluded after a detailed investigation of behavioral and cognitive functions and negative genetic results. Brain MRI was performed, and MRI T2W/Flair showed several hyperintense signals in the cerebral cortex, most in the temporal and insular cortex. CSF analysis revealed 7×10^6 /L white blood cells and an elevated protein concentration of 1.31 g/L. Autoimmune encephalitis diagnosis was suspected; therefore, the treatment of methylprednisolone pulse therapy was started. Meantime, serum nontreponemal and treponemal test results came positive: RPR was reactive at 1:16, TPHA was positive (4+), and IgG/IgM antibodies of *Treponema pallidum* were present. The treatment of intramuscular injection with benzylpenicillin G 3 million I.U. every 4 hours (6 times per day), in total 18 million I.U. was started. After 22 days of treatment, the woman was discharged without significant improvement in cognitive functions.

Summary. This case illustrates its complexity in diagnosing patients with cognitive impairment caused by the late presentation of neurosyphilis. Due to non-specific symptoms, this disease was identified after CNS was already irreversibly damaged.

Conclusions. Nowadays, syphilitic dementia is a rare complication of late neurosyphilis, but screening for chronic infections remains important in the differential diagnosis of cognitive impairment.

MULTIDISCIPLINARY TREATMENT OF GIANT PROLACTINOMA IN YOUNG ADULT

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Keywords. Giant prolactinoma; Hyperprolactinemia; Neurosurgery

Introduction. Prolactinomas are characterized by their hormonal activity and size. Tumors above 4 cm are considered giant (they form less than 1% of all pituitary tumors), which are challenging to manage, because of extreme hyperprolactinemia and tumor tissue compressing optic chiasm and invading cavernous sinus.

Case Description. An 18-year-old male patient sought help from an ophthalmologist after two months of severe vision loss (VOS = 0.01, VOD = 0.1). Performed exams, such as MRI and blood tests, showed further results: left optic nerve compression due to giant intrasellar lesion with blood prolactin 358071.00 mIU/L (norm – 89–365 mIU/L), leading to diagnosis of giant prolactinoma. Total tumor resection was technically impossible, so a combination of surgical and pharmacological therapy was chosen. First, patient was treated with Cabergoline which decreased prolactin concentration to 107175.00 mIU/L in two weeks, tumor shrank from 5.1×4.9×4.7 cm (61.5 cm³) to 4.5×4.3×3.6 cm (36.5 cm³) and the patient regained his vision totally. Routine microscopic transsphenoidal adenomectomy was performed to decompress optic chiasm and reduce hormone secreting mass. This led to decreased prolactin concentration of 45977.97 mIU/L. A year after, prolactin concentration is gradually decreasing, vision is normal and follow-up MRI shows only 3.3×2.1×1.8 (6.5 cm³) of tissue remnants.

Summary. An 18-year-old male patient with giant prolactinoma showed a significant positive response to combined pharmacological and surgical therapy (decreased tumor size, prolactin secretion and optic nerve compression) in brief period.

Conclusions. Giant prolactinomas are known for their immense hormonal activity, which cannot be controlled with either only surgery or pharmacological treatment. Despite general practice of conservative surgical prolactinoma treatment, this case displays the importance of combined surgical and pharmacological therapy.

LARGE THALAMIC ARTERIOVENOUS MALFORMATION GAMMA KNIFE RADIOSURGERY

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Keywords. Arteriovenous malformation; Stereotactic surgery

Introduction. Arteriovenous malformation (AVM) is a serious and rare cerebro-vascular condition, potentially leading to uncontrolled intracerebral bleedings. AVM nidus rupture near eloquent brain structures usually leads to permanent neurological deficit. Treatment options may include observation, endovascular embolization, microsurgery, stereotactic surgery. Most difficult to manage are large volume deep seated AVM when open surgery or embolization are not an option. High dose up to 24 Gy radiosurgery has been proven as most effective for AVM nidus obliteration, but smaller and safer dosages for proper selected patients can also achieve good results.

Case Description. A 14-year-old patient with mild schizophrenia symptoms undergone diagnostic MRI with angiography. It showed Spetzler-Martin grade 4 left thalamic AVM with, nidus 4.5×2.6×4.0 cm. For final diagnosis confirmed with cerebral angiography which showed deep venous drainage and multiple feeders. Microsurgery and endovascular embolization were contraindicated. After detailed angiostructure analysis and possible outcome discussions with parents – stereotactic surgery with Gamma Knife ICON 18Gy/48% isodose (Treatment volume 11.2 mL) to AVM nidus was performed. Follow up MRI angiography were performed one and two years after the radiosurgery. On the left side of thalamus T2W sequences showed unevenly hyperintensive MRI SI regions, drastically decreased in size – 2.3×1.1×1.8 (scar). MRI arteriography showed only few small vessels with present blood flow signal. A larger AVM vessel remains, left cistern in ambient region – no blood flow signals.

Summary. A patient was accidentally diagnosed Spetzler-Martin grade 4 AVM. Stereotactic surgery with Gamma knife radiosurgery was chosen as safest treatment option – otherwise the patients would have been left for observation (since microsurgery and endovascular embolization was not an option). Despite slow radiobiological AVM response follow up showed significant AVM nidus reduction after first MRI.

Conclusions. Stereotactic radiosurgery with Gamma knife has proven to be an effective and safe thalamic AVM treatment option.

TRIGEMINAL NERVE BRANCH BLOCK IN REFRACTORY TRIGEMINAL NEURALGIA

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Keywords. Trigeminal neuralgia; Nerve block; Chronic pain

Introduction. Trigeminal neuralgia is a debilitating chronic neuropathic pain condition characterized by sudden and severe burning or shock-like facial pain that lasts several seconds to a few minutes per episode. Pharmacological therapy is the first-line treatment. Unfortunately, due to persistent pain despite medications, other methods for pain control are needed. The use of the trigeminal nerve branch block with a local anesthetic serves as an excellent adjunct to drug treatment.

Case Description. 62-years old male patient complained about the constant, pulsating, burning face pain without irradiation that worsens at night. Based on chronic pain scale the patient evaluated his pain 8–9 points. The pain started in 2015 after he had shingles (Herpes zoster infection), which complicated into nervus trigeminus supraorbitalis brunch damage. His illness differentiated with migraine, MRI examination was without significant changes. He was treated for a while with COX inhibitors with negligible effect. The patient applied to the chronic pain clinic due to poor quality of life. Treatment was adjusted: course of Gabapentin, Carbamazepine and Amitriptyline was started. The character of pain changed to dull therefore the treatment was corrected: 5 courses of Ketamine 15 mg. It had poor effect, patients pain diminished to 5–6 points only for one week. After years of unsuccessful treatment he was deviated to interventional pain management. Supraorbital nerve block was performed with the use of Ropivacaine and Triamcinolone. The patient felt a positive effect after the third procedure. The patients pain decreased from 8–9 to 3 points.

Summary. This case report demonstrates that patients with trigeminal neuralgic pain refractory to medical therapy can be considered for interventional therapy such as trigeminal nerve branch block.

Conclusions. This technique rapidly relieves pain while medications are being titrated to effective levels. This way of pain management helps to improve the quality of patient's life.

EFFECTIVENESS OF REHABILITATION FOR THE PATIENT AFTER CONCUSSION AND EDEMA OF CERVICAL SPINAL CORD

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Keywords. Spinal cord injury; Trauma; Rehabilitation

Introduction. Spinal cord injury (SCI) – damage to the spinal cord from trauma, disease, or degeneration. Estimated annual incidence is around 40 to 80 cases per million population globally. Up to 90% of SCI are due to traumatic events such as road traffic crashes, falls, or violence.

Case Description. A 23-year-old man was hospitalized after a car accident. A CT scan revealed a fragmentary fracture of the C4 body and arches, retrolisthesis of the vertebra into the spinal canal, suspected bleeding area pressing on the spinal cord. After neurosurgical treatment, the patient received physical and occupational therapies, massage and physiotherapy. Changes in muscle strength of the limbs according to the Lovett scale at the beginning and end of rehabilitation: in the right arm proximally from 0 to 2, distally from 0 to 2, in the left arm proximally from 1 to 2, distally from 1 to 4, in the right leg proximally from 0 to 2, distally from 0 to 2, in the left leg proximally from 2 to 5, distally from 3 to 5 points. To assess hand function and coordination, a Box and Block Test was performed in the middle and at the end of rehabilitation. Right hand improved from 2 to 48, left hand – from 9 to 10 blocks per minute. Dynamometry results enhanced in the right hand from 0 to 5.5 kg, in the left hand from 0 to 30.6 kg. Functional independence test results changed from 40 to 93 points. Barthel index results improved from 5 to 60 points.

Summary. A 23-year-old man underwent rehabilitation after a car accident and achieved significant positive changes in his functional activities.

Conclusions. Such significant functional recovery after this type of injury is not common but the young patients' age and individualized rehabilitation are crucial factors.

A RARE CASE OF CEREBRAL AMYLOID ANGIOPATHY RELATED INFLAMMATION IN A PATIENT WITHOUT ALZHEIMER'S DISEASE PRESENTING WITH SYNCOPE AND HALLUCINATIONS

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Keywords. Angiopathy; Amyloid

Introduction. Cerebral amyloid angiopathy (CAA) is a rare neurovascular disorder characterized by accumulation of amyloid beta-peptide within the leptomeninges and small to medium sized cerebral blood vessels, which consecutively leads to intracerebral hemorrhages (ICH) and focal neurological impairment. Only 7% population without Alzheimer's disease (AD) have CAA and < 0.5% have CAA-related inflammation (CAA-ri). This case report shows CAA-ri without AD.

Case Description. 65-year-old male presented to emergency department after a syncope, vertigo, instability, disorientation, hallucinations and headache. CT scan proposed a mass in the posterior cranial fossa. Blood glucose of 17.5 mmol/L was found, patient was stationed in Endocrinology department. The last month patient experienced hallucinations, spoke delusionally and had 2 syncopes. Patient denied other mental disorders. Patient started treatment for hyperglycemia and head MRI was performed, in which CAA was found with lobar hemosiderin inclusions, ICH in left temporal lobe and CAA-ri with edema in occipital, parietal and temporal lobes. Based on the modified Boston criteria, patient was diagnosed with CAA-ri. Patient was treated with high dose glucocorticoids, that was effective and continued treatment until a control imaging after three months. 3 months later patient showed significant improvement, yet hallucinations and headache were still present. MRI showed lessening of the edema and increase in small hemorrhages throughout the brain. Patient continues treatment with glucocorticoids until next MRI screening in three months. After another three months no significant difference on MRI or in clinical presentation was noticed. Patient continues treatment.

Summary. Case shows a typical presentation with a variety of differential diagnoses. Treatment with high dose glucocorticoids showed clinical benefit. In follow-up imaging the inflammation had lessened and overall patient status had stabilized.

Conclusions. CAA-ri is a rare disease presenting with often misleading symptoms. The diagnosis is made by excluding other possible causes of ICH. Not all cases coexist with AD. The treatment is effective proving value in early recognizing of CAA.

CASE REPORT: MOYAMOYA SYNDROME

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Keywords. Neurovascular; Stroke; Rare diseases; Revascularization; Moyamoya disease; Moyamoya syndrome

Introduction. Moyamoya disease (MMD) is a rare idiopathic progressive cerebrovascular disease that leads to narrowing and occlusion in the terminal portion of the internal carotid arteries (unilaterally or bilaterally) causing compensatory angiogenesis and vasodilation at the base of the brain in order to meet the demand for oxygen and nutrients.

Case Description. We describe a case of a 35-year-old Caucasian male presenting to the Emergency department with a complaint of continuous headache that lasted for a week and was graded as 9/10. Neurological examination showed no abnormalities; CT scan and angiography of the head showed bilateral narrowing in the terminal portion of the internal carotids. DSA confirmed typical Moyamoya findings; MRI showed ischemic changes bilaterally and a minor subarachnoid hemorrhage of the left frontal lobe. The patient received surgical treatment using an indirect method – encephalo-myo-synangiosis. Postop period was uneventful. Surgical intervention with the direct approach to the right side is scheduled to be done.

Summary. The patient was suspected to have Moyamoya disease, was diagnosed, and treated within 39 days of admission. Blood tests, CT, CTA, DSA, and MRI were diagnostic modalities of choice. The treatment method of choice is surgery.

Conclusions. Moyamoya disease is a rare condition which is often overlooked because of the symptoms that may not be specific enough to order CT angiography in order to confirm the diagnosis. This disease is not curable, but symptoms can be managed using surgical intervention.

CLINICAL MANIFESTATIONS' HETEROGENEITY OF AUTOSOMAL DOMINANT OPTIC ATROPHY PLUS SYNDROME

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Keywords. ADOA plus; OPA1 gene; Optic atrophy; Peripheral neuropathy

Introduction. Autosomal dominant optic atrophy plus syndrome (ADOA plus) is a rare condition which is characterized by bilateral degeneration of optic nerves. It usually begins in the first decades of life, causing gradual loss of vision. The cause of the syndrome is a pathogenic mutation of the OPA1 gene. Sensorineural hearing loss, ataxia, myopathies and progressive ophthalmoplegia may also be observed in patients with this disease later in life. The prevalence of this syndrome is between 1/1 000 000 and 9/1 000 000.

Case Description. Case I is a 59-year-old man with progressive weakness and stiffness in his legs since the age of 40 and a gradual deterioration of vision since the age of 10. In the family health history, mother and grandfather experienced similar symptoms. When performing ophthalmological and electrophysiological examinations, bilateral optic nerve atrophy and polyneuropathy were observed in the nerves of the arms and legs. A mutation of the OPA1 gene is detected in the genetic examination. Case II is an 83-year-old man with tingling and numbness in the legs, and double vision which started 30 years ago. The symptoms have progressed to general malaise, unsteady gait, and oculomotor movement disorders. When performing ophthalmological and electrophysiological examinations, bilateral optic nerve atrophy and deep, motor-sensory, axonal demyelinating polyneuropathies were observed in the nerves of the hands and feet. A mutation of the OPA1 gene is detected in the genetic examination.

Summary. Small clinical case series describes the various manifestations and diagnosis of ADOA plus syndrome. Diagnosis involved family history collection, clinical manifestations, and genetic testing to confirm the OPA1 gene mutation, which is important for diagnosis.

Conclusions. ADOA plus syndrome has various clinical manifestations and variable expressivity, for this reason, the only way to confirm it is through genetic testing.

CHALLENGES IN THE DIAGNOSIS OF PARKINSON'S DISEASE FOR YOUNG PATIENTS

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Keywords. Juvenile; Parkinson's disease; PRKN gene

Introduction. Parkinson's disease (PD) is one the most common neurodegenerative movement disorders. The mean age of onset of disease is in the early-to-mid 60s manifesting with bradykinesia, rigidity and tremor. However, there are some difficulties to diagnose PD for young patients.

Case Description. A 36-year-old woman was admitted to Neurology Outpatient unit due to deterioration of gait, stiffness of left side of the body, muscle cramps and inversion of the right foot. Her mental status was found normal. Similar symptoms have been shown since the age of 15. In the year of 2010 CT and MRI were performed – no structural causes were found. As the symptoms persisted, in 2011 the patient was diagnosed with levodopa-sensitive idiopathic familial dystonia, due to 30% improvement in the motor portion of the Unified Parkinson Disease Rating Scale after taking Levodopa/Benserazide test. For treatment she used Levodopa/Benserazide prolonged release form with gradually increased dosage until 2018. After reported side effects it was changed to Levodopa/ Carbidopa and Trihexyphenidylum sustained-release form. Regarding the possibility of familial dystonia genetic tests were performed – no mutations in TOR1A gene were found. In 2020 neurosurgeons implanted the globus pallidus internus (GPi) deep brain stimulation (DBS) bilaterally, however, recurrent symptoms require changes in parameters and medical treatment till this day. In 2022 09, following genetic tests, a mutation in PRKN gene was found and finally she was diagnosed with juvenile PD, type 2.

Summary. A 36-year-old patient with rapidly progression of atypical signs and symptoms such as dystonic posture and muscle cramps and a requirement of different treatment is presented. After a delayed diagnosis, finally genetically inherited PD form was diagnosed.

Conclusions. Although the clinical diagnostic criteria for PD is validated, an accurate diagnosis of PD remains a challenge because clinical features can overlap with those of other movement disorders.

TRIGEMINAL NEURALGIA CAUSED BY NEUROVASCULAR COMPRESSION IN YOUNG ADULT

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Keywords. Neurovascular conflict; Trigeminal neuralgia; Microvascular decompression

Introduction. Trigeminal neuralgia (TN) is a severe, sudden form of facial pain that can be debilitating if left untreated. Patients present with short periods of pain that can become more frequent and intense over time. It typically affects the elderly. However, the most common cause of compression in young adults is venous – isolated or associated with arterial nerve compression.

Case Description. A 25-year-old male with right trigeminal neuralgia complained of sharp, electric shock-like facial pain on the right side, which started 4 years ago. During the last month, the pain had become more regular, more pronounced while eating, drinking, and talking, and more intense at night and after waking up. Conservative therapy with Carbamazepine was initiated but proved ineffective. After a long search for the cause and visits to several doctors magnetic resonance imaging (MRI) and angiography (MRA) were done to clarify the diagnosis. Based on MRI, there was no evidence of pathology in the major intracranial arteries. MRI confirmed a neurovascular conflict between the right trigeminal cistern, petrous vein, and superior cerebellar artery with root deformity. A developmental variant with a smaller right vertebral artery was also been identified. The patient underwent right-sided posterior fossa craniotomy and nervus trigeminus microvascular decompression surgery using a Teflon pad. After the applied treatment, the patient's condition improved and the pain was not observed.

Summary. A 25-year-old male presenting with right trigeminal neuralgia for 4 years. MRI of the brain verified a neurovascular conflict between the right trigeminal nerve with the upper cerebellar artery and petrosal vein. Microvascular decompression for Trigeminal neuralgia was performed.

Conclusions. TN is a common cause of chronic facial pain that affects the patient's quality of life. Although it's more common in older patients, we need to recognize symptoms and rule out underlying causes in younger adults, which can be treated surgically.

COVID-19 INDUCED ENCEPHALITIS IN WILSON'S DISEASE: A CASE REPORT

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Keywords. COVID-19; Wilson's disease; Viral encephalitis

Introduction. Wilson's disease (WD) is an autosomal-recessive disorder of copper metabolism that leads to impaired function of the intracellular copper transporter *ATP7B*. Due to impaired biliary copper excretion, it manifests by hepatic, neurological, psychiatric, and ophthalmological dysfunctions.

Case Description. A 25-year-old female was hospitalized with general weakness, lethargy, behavior disorder, gait abnormalities, and urinary incontinence. Neurologically – insignificant weakness in left limbs, Rossolimo's sign, and instability in Romberg's position. A CT and MRI showed the unspecific changes in the brain differing between dysmetabolic encephalopathy, encephalitis, neurotoxoplasmosis, angiocentric lymphoma. In cerebrospinal fluid cytometry – no data for the lymphoproliferative disorder. Dexamethasone and mannitol therapy were started. A stereotactic brain biopsy was performed to specify the diagnosis. During treatment, the preventive examination of the SARS-CoV-2 came positive. Also, liver enzymes were increasing, consequently, a panel of viral hepatitis, autoimmune and rare liver diseases was done. In abdominal ultrasound and CT – an enlarged dysmetabolic liver. Due to increased liver enzymes, elevated copper level in urine, and decreased ceruloplasmin, empiric D-penicillamine therapy was started. Genetic testing for mutation in the *ATP7B* gene was performed and complex heterozygous c.3207C > A and c2389_2398del mutation was detected. In histological samples – liver steatosis. The diagnosis of WD was confirmed and the D-penicillamine dose was increased. In brain biopsy material – lymphocytic vasculitis associated with a viral infection and positive immunologic reactions with the SARS-CoV-2 marker. As the neurological condition improved and liver enzymes decreased, the patient was discharged for rehabilitation, and treatment with D-penicillamine and methylprednisolone was continued.

Summary. This clinical case describes a 25-year-old female patient diagnosed with the unique combination of COVID-19 encephalitis and WD that requires a multidisciplinary approach.

Conclusions. The diagnostic plan for patients with WD and COVID-19 encephalitis includes multiple laboratory and morphology tests, imaging, and differential diagnosis might be challenging for medical professionals.

INCIDENTAL FINDING OF UNRUPTURED RIGHT OCCIPITAL LOBE ARTERIOVENOUS MALFORMATION IN CONTROL WHOLE NEURAXIS MRI AFTER SURGICAL RESECTION OF SPINAL EPENDYMOMA

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Keywords. Ependymoma; Neuraxis; Arteriovenous malformation

Introduction. Spinal ependymomas and cerebral arteriovenous malformations are separate pathological entities. So far, there is no data available in literature, where they are diagnosed simultaneously in a single patient and are not a part of any known medical syndrome or genetic disorder.

Case Description. A patient in her mid-forties, had complaints about lower back pain with electric shock like irradiation to both hips. Magnetic resonance imaging (MRI) of the patient's lumbosacral spine revealed a non-homogeneous intradural mass at L₁-L₂ level. To remove the mass the patient had intradural mass resection via L₁ hemilaminectomy. A biopsy sample was taken for histological diagnostics. Postoperative period was without complications and the patient was discharged from the hospital. Later the pathohistological diagnosis determined the resected mass to be a grade 2 ependymoma. Since ependymoma can be characterized by so called "drop metastases", the patient was recommended to have whole neuraxis MRI. The head MRI concluded the incidental finding – unruptured arteriovenous malformation in the right occipital lobe (Spetzler – Martin grade I (type A)). After diagnosis a successful endovascular embolization was performed.

Summary. A patient in her mid-forties had a surgery for L₁-L₂ intradural grade II ependymoma. The postoperative control whole neuraxis MRI revealed an unruptured brain arteriovenous malformation which was treated with endovascular embolization.

Conclusions. Concomitant spinal ependymoma and brain arteriovenous malformation could be found in a single patient.

INFECTIOUS DISEASES, IMMUNITY AND ALLERGOLOGY

ALTERED BLOOD METABOLOME IN HEREDITARY ANGIOEDEMA PATIENTS

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Objectives. Hereditary angioedema (HAE) is a rare, life-threatening, inborn immunity error caused by a deficient or dysfunctional C1 esterase inhibitor (C1-INH), leading to the overproduction of bradykinin and the development of recurrent subcutaneous or submucosal edema. Although biomarkers have been discovered in many pathologies, only a few are currently used in clinical practice to diagnose HAE. Investigating the metabolomic profile of HAE, which remains unclear, may contribute to a better understanding of the pathogenesis of HAE and may explore potential new metabolic biomarkers for diagnosis, assessment of disease activity, and management of these clinical entities. This study aims to explore the metabolomic profiles of HAE patients and identify new biomarkers that could be used for diagnosing HAE and evaluating disease activity.

Materials and Methods. Blood plasma samples from 10 HAE (types I/II) patients and 20 healthy controls were measured using targeted metabolomics workflow. Metabolite analysis was performed using HILIC-based separation combined with high-resolution mass spectrometry detection. Obtained data were processed using TraceFinder 5.1 software, and statistical analysis was carried out using GraphPad Prism 9.

Results. The quantitative values for 33 metabolites were obtained, out of which 7 metabolites had significantly lower ($p < 0.05$) concentrations in HAE plasma compared to controls. Among these metabolites were creatinine, amino acids, and several acylcarnitines. It should be noted that carnitine results align with previous studies in HAE urine samples. ROC curve analysis for biomarkers revealed that the creatinine/cystine ratio could distinguish between HAE patients and controls with an AUC of 0.923 (sensitivity 0.909, specificity 0.85).

Conclusions. Our study identified the creatinine/cystine ratio as a potential biomarker for HAE diagnosis. New biomarkers could provide more opportunities for precise, timely, and cost-effective diagnosis of HAE and personalized management in choosing the most appropriate treatment.

ALTERNATIVE TO PREVENT AND COMBAT BIOMATERIAL-ASSOCIATED INFECTIONS: CLINICALLY RECOGNISED BACTERIOPHAGE-BASED BIOPOLYMERS

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Objectives. The application of biomaterials in medical devices is facing increased demand. Nonetheless, medical devices may serve as abiotic surfaces to be colonized by biofilm-producing bacteria, which commonly leads to biomaterial-associated infections. Such challenges as biofilm formation and widespread antimicrobial resistance to commonly used antibiotics have led to an emerging need for alternative strategies to overcome possible biomaterial-associated infection prevention and treatment failure. Our study aimed to evaluate clinically recognized biopolymers as carriers for bacteriophages to develop a potential system for targeted and controlled local delivery of antimicrobials, i.e., bacteriophages.

Materials and Methods. Three biopolymers, two commercial bacteriophage cocktails, and one host reference bacterial strain were used in the study. Both bacteriophage cocktails had their viral titer determined by plaque assay, from which plaque-forming units per milliliter were calculated for each phage stock. A repetitive bacteriophage propagation procedure was executed to attain a higher viral titer. High-titer phage stocks were incorporated into biopolymers. The release profile and stability of phages within bacteriophage-impregnated biopolymers were evaluated by performing a plaque assay after different incubation periods.

Results. The bacteriophage propagation procedure was successfully applied to both commercial phage stocks resulting in increased viral titers. Regarding the preparation of bacteriophage-based biopolymer mixtures, characterization of the molecular structure revealed that the chosen sterilization method for biopolymer solutions was suitable. The data obtained showed that the viral titer of released bacteriophages varied among different bacteriophage/biopolymer mixtures and their texture properties over the study period.

Conclusions. Taken together, the present findings in our study suggest that clinically recognized alginate-based biopolymers can be considered promising carriers for alternative antimicrobials such as bacteriophages. However, further investigations and characterization of bacteriophage-based biopolymers should be of particular interest for developing clinically available and safe local delivery systems of bacteriophages from microbiological, biocompatibility, and materials science perspectives.

ANALYSIS OF SINGLE ACCUMULATED NUCLEOTIDE VARIANTS AND MUTATION RATE IN *M. TUBERCULOSIS* ISOLATE PAIRS USING THE WHOLE GENOME SEQUENCING APPROACH

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Objectives. Whole genome sequencing (WGS) has become an irreplaceable tool in studying different aspects of *Mycobacterium tuberculosis* (Mtb) infection, such as microevolution, drug resistance and recurrence. However, data about acquired genomic mutations during human infection are still limited. The aim of this research was to explore mutation rate and accumulated single nucleotide variants (SNVs) in Mtb isolate pairs obtained during either a single or two different tuberculosis (TB) episodes.

Materials and Methods. WGS was performed on 52 Mtb isolate pairs of identical genotypes acquired from pulmonary TB patients (2002–2019). Gene-based annotation and functional effect prediction were performed on differing SNVs detected in isolate pairs with pairwise SNV-distance ≤ 10 . Mycobacterial mutation rate was calculated as SNVs/genome/year for isolate pairs where differing SNVs were found only in subsequent isolates.

Results. 77 differing SNVs among 29 Mtb isolate pairs were detected, and the majority was located in protein-coding genes (68/77). Missense (33/68) and synonymous (32/68) mutations were more common than stop mutations (3/68). No SNV accumulation pattern could be determined since new variants were mostly randomly distributed throughout the whole Mtb genome. In contrast, four patients infected with multidrug-resistant Mtb strains of Beijing ($n = 3$) and LAM ($n = 1$) genotypes developed fluoroquinolone resistance due to accumulation of additional SNVs in *gyrA* gene. The mutation rate was calculated for 37 Mtb isolate pairs. In 18 cases it was equal to zero, in 17 isolate pairs the mean mutation rate was 0.36 ± 0.16 SNVs/genome/year, and two outlier values of 2 and 2.47 SNV/genome/year were obtained for drug-resistant single-episode isolates of Beijing genotype.

Conclusions. This study highlighted the overall tendencies of SNV accumulation in Mtb genome. Further investigation is needed to decipher factors triggering selective fluoroquinolone resistance development and high mycobacterial mutation rate in different Mtb genotypes. This study was supported by the ERDF grant No 1.1.1.1/20/A/046.

APPLICATION OF LASER SPECKLE TECHNOLOGY FOR DETERMINATION OF ANTIBACTERIAL ACTIVITY

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Objectives. Bacterial contamination can pose a threat to human health and safety. One way to control it in health facilities is to use coatings with antibacterial properties.

Copper oxide nanostructures have been proved to possess antibacterial and biocide properties.

Laser speckle imaging is an imaging technique based on the analysis of the blurring effect of the speckle pattern. It has been used in numerous studies in wide range of different fields. The aim of our research is to evaluate the application possibilities of this technology in determining the antimicrobial properties of various materials.

Materials and Methods. A total of 24 different sol-gel CuO surface coatings on polished or phosphatated AISI304 steel (10×3 mm) were examined. Coatings contained 0.5, 1, 3, 5 weight% CuO and 1, 3 or 5 deposited layers.

The antibacterial effect was determined to all samples with novel dried droplet method using *E.coli*35218. Laser speckle technique was used to determine its potential to be used in evaluation of antibacterial effect, it can visualize submicron movement which can correspond to activity to any object in our case bacteria.

Results. Phosphatized steel coating showed greater antibacterial effect than polished coatings (average antibacterial effect 86.7% vs 35.4%)

Using laser speckle technique bacteria activity signal strength were detected. (Values from 0 to 255). To calculate antibacterial effect, control value was subtracted from sample values and those with higher negative value had greater antibacterial effect, 0 or positive value being no antibacterial effect. Almost all phosphatized samples shown antibacterial effect, while only few polished samples had any. Average phosphatized vs polished were –7.6 vs –0.7.

Conclusions. Surface samples deposited on phosphatized steel showed greater antibacterial effect than those deposited on polished steel.

Compering both methods, results in most cases were similar, thus showing the potential to use laser speckle method to determine antibacterial effect. To successfully validate this method further experiments are needed.

ASO AND CRP SERUM LEVEL CORRELATION WITH POSITIVE BETA HEMOLYTIC STREPTOCOCCUS THROAT CULTURES

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Objectives. The aim of the study is to identify the increase of ASO and CRP levels in correlation with positive beta-hemolytic streptococcus throat culture.

Materials and Methods. ASO and CRP detection was made by Roche, Cobas Pro (c503) - Immunoturbidimetric assays. For microbiological examination, the test material was inoculated onto CNA media and identification of microorganisms was made using Bruker MALDI-TOF system.

Results. From 01.01.2021 to 31.12.2022 951 throat samples were examined. 23.55% were positive for beta hemolytic Streptococcus. A group was identified 69.64%, 17.31% were tested also for CRP and ASO. 14.81% CRP and ASO were increased, but 33.33% CRP and ASO were in normal values, 33.33% CRP was increased and ASO was normal, and 18.53% CRP was normal, but ASO was increased. B group was isolated 3.13%, it wasn't tested for ASO, but in one case CRP was tested and it was increased. C group was isolated in 20.09%, 8.89% was tested also for CRP and ASO, 75% ASO was increased, but CRP was normal and 25% both markers were normal. G group was isolated 7.14%, ASO and CRP were tested in 6.25%, CRP was increased and ASO was normal.

Conclusions. ASO and CRP can't be used as only markers for Streptococcus infection laboratory diagnostics. From 23.55% positive throat samples about 5% CRP and ASO levels were in normal ranges. So microbiological testing should stay as Gold standard for identification of beta hemolytic Streptococcus.

ASSESSMENT OF RIFAMPICIN EXPOSURE IN LATVIAN PULMONARY TUBERCULOSIS PATIENTS IN THE CONTEXT WITH AADAC GENETIC POLYMORPHISMS

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Objectives. The anti-tuberculosis (anti-TB) treatment success largely depends on M. tuberculosis drug susceptibility and adequate drug exposure. Rifampicin (RIF), one of the most important drugs in TB treatment, is a substrate of human liver arylacetamide deacetylase (AADAC). Recent studies suggest that polymorphisms in the AADAC gene are associated with RIF pharmacokinetic variability. This study aimed to evaluate RIF exposure in pulmonary TB (PTB) patients considering the AADAC haplotype.

Materials and Methods. The study population comprised PTB patients (n = 58) admitted to the Riga East University Hospital, Centre of Tuberculosis and Lung Diseases. The AADAC haplotype was determined using a targeted NGS-based methodology designed for the analysis of TB-associated pharmacogenes. Sequencing data were processed on Galaxy open-source platform; detected variants were annotated using an online-based wANNOVAR tool. The RIF concentration was measured using LC-MS/MS method in the plasma samples collected pre-dose, 2 h and 6 h post-dose. The statistical data analysis was performed using jamovi software (The jamovi project, v2.3); Quade's rANCOVA was conducted to compare RIF exposure between detected haplotypes considering body weight and dose.

Results. The NGS sequencing results showed that patients were predominately either AADAC*1/*2 or AADAC*2/*2 haplotype carriers (25.9% and 70.7%, respectively). The rare AADAC*1/*1 (wild-type) and AADAC*2/*3 haplotypes were detected in one patient each (1.7%). Overall, the prevalence of lower than recommended RIF plasma concentration (< 8 µg/mL) 2 h post-dose was 93.0%. Further analysis did not reveal any statistically significant differences in adjusted RIF AUC_{0-6h} between the detected AADAC haplotypes (p > 0.05).

Conclusions. The observed RIF underexposure in PTB patients is in line with previously reported findings. However, our results did not indicate the potential impact of the AADAC haplotype on RIF exposure. Further studies are required to identify and assess other factors contributing to RIF underexposure.

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ASSOCIATED HHV-6 VIRAL LOAD AND CHANGES IN IMMUNOLOGIC PROFILE IN FIBROMYALGIA

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Objectives. Fibromyalgia (FM) is the most prevalent type of widespread chronic pain disorders, affecting around 4.7% of the population. The most common symptoms of FM are chronic widespread pain, peripheral sensitization, depression, and anxiety, which affect a person's daily activities and are a burden to the health system. The lack of measurable biomarkers for diagnosing this disease means that it depends on physicians' knowledge and subjective opinion. The objective of this study is to identify FM-specific measurable indicators with biomarker potential that may help to diagnose and estimate the disease, by analysing viral infections, cytokine profile, and their interactions.

Materials and Methods. Deoxyribonucleic acid (DNA) was isolated from samples using Qiagen All prep mini kit. DNA was tested for human herpesviruses (HHV) – 6A and 6B using the quantitative PCR kit “RealStar HHV-6 PCR kit 1.0”. Plasma from both healthy controls and FM patients were analysed for interferon (IFN)- γ , interleukin (IL)-1 β , IL-2, IL-6, IL-8/ chemokine (C-X-C motif) ligand (CXCL)8, IL-9, IL-10, IL-17A/ cytotoxic T-lymphocyte antigen (CTLA)8, IL-18, tumor necrosis factor (TNF)- α cytokines using Luminex technology.

Results. The obtained results show detection frequency and load (copies/106cells) of HHV-6 A and B in analysed groups of patients with FM and apparently healthy controls. In addition, differences are estimated in circulating plasma IFN- γ , IL-1 β , IL-2, IL-6, IL-8/CXCL8, IL-9, IL-10, IL-17A/CTLA8, IL-18, TNF- α levels between FM patients and control groups.

Conclusions. Differences between the frequency/load of HHV-6 and the level of immunologic markers in FM and the control group indicate a biomarker potential in FM, which needs to be approved in a larger study.

BACTERIAL COLONISATION AND ROLE OF BACTERIAL BIOFILMS IN THE UPPER RESPIRATORY TRACT

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Objectives. To evaluate the tonsillar crypts as a potential reservoir for clinically important pathogens and analyse biofilm formation and antibacterial susceptibility of isolated strains.

Materials and Methods. In a prospective cohort study tissue samples were obtained from tonsillar crypts of 91 healthy students. Samples were acquired with a brush and cultivated on Columbia blood, Mannitol salt, MacConkey, Sabouraud dextrose, Brucella blood and Chocolate agar. Bacteria were identified with MALDI–TOF mass spectrometer. Antimicrobial susceptibility was detected using disk diffusion test. Crystal violet assay was used for assessment of biofilm production.

Results. Oropharyngeal microbiota were cultivated from 37 participant samples (40.7%). The *S. aureus* predominated, it was detected in 41 (45%) participant samples. *K. pneumoniae* was isolated in 7 (7.7%) samples, *Acinetobacter* spp. were isolated in 5 (5.5%) samples, and *P. aeruginosa* was isolated in 2 (2.2%) samples. *S. aureus* strains were predominantly biofilm producers: 25 out of 41 (61%) *S. aureus* strains were moderate or strong biofilm producers, and 14 out of 41 (34.1%) *S. aureus* strains were weak biofilm producers, but 2 out of 41 (4.9%) *S. aureus* strains were biofilm nonproducers. Among the Gram-negative bacteria, 6 out of 15 (40%) strains were moderate or strong biofilm producers and 6 out of 15 (40%) strains were weak biofilm producers, but 3 out of 15 (20%) strains were biofilm nonproducers. The tested *S. aureus*, *K. pneumoniae*, *P. aeruginosa*, and *Acinetobacter* spp. strains were sensitive to commonly used antibiotics (cefoxitin, amoxicillin – clavulanic acid, clindamycin, or ciprofloxacin). One *S. aureus* strain was MRSA.

Conclusions. Biofilms seem to be a naturally existing form of pathogenic bacteria that are colonizing human tissues of healthy individuals. *S. aureus*, *K. pneumoniae*, *P. aeruginosa*, and *Acinetobacter* spp. can be found in the tonsillar crypts of healthy individuals, and it is therefore most likely that opportunistic tonsillar infections originate from the tonsillar crypt microbiota.

BIOFILM FORMATION ON DIFFERENT SMOOTH AND TEXTURED SILICONE BREAST IMPLANT BIOMATERIALS

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Objectives. The aim of this research is to investigate the ability of *Staphylococcus epidermidis* ATCC 12228, *Pseudomona aeruginosa* ATCC 27853 and *Candida albicans* ATCC 10231 to form biofilms – on smooth, micro-textured and macro-textured breast silicone biomaterial in an *in vitro* study.

Materials and Methods. A total of 90 samples of silicone biomaterial outer shells were used, with (n = 30) for each type of biomaterial – smooth, micro- and macro-textured. In each of the biomaterial groups, half of the samples (n = 15) were used to determine the biofilm formation after 2-hour incubation in microorganism suspension and the other half to determine biofilm formation after 24-hour incubation in microorganism suspension on the active surface of the samples. Later the samples were sonicated for one minute in 44 kHz frequency, then the suspense was mixed and cultured on Trypticase soy and Sabouraud agar for 48 hours.

Results. The most intense biofilm formation after 2 H was shown by *Paeruginosa* (smooth 454 CFU/cm², micro 1135 CFU/cm², macro 2383 CFU/cm² on average), followed by *S.epidermidis* (454 CFU/cm², 340 CFU/cm², 794 CFU/cm² on average respectively) and *C.albicans* (340 CFU/cm², 113 CFU/cm², 227 CFU/cm² on average respectively). Increased biofilm formation after 24 H was demonstrated by *Paeruginosa* (smooth 1×10^6 CFU/cm², micro 3×10^6 CFU/cm², macro 1.1×10^7 CFU/cm² on average), followed by *S.epidermidis* (4.5×10^5 CFU/cm², 1.3×10^6 CFU/cm², 3.6×10^6 CFU/cm² on average respectively) and *C.albicans* (1×10^4 CFU/cm², 1.6×10^4 CFU/cm², 3.6×10^4 CFU/cm² on average respectively).

Conclusions. The strongest biofilm formation after 2 H was to the surface of macrot textured implant. Among microorganisms, which showed the highest biofilm formation rates after 24 H were *Paeruginosa*. The most intense biofilm formation was on the macro-textured implant, then on the micro-textured and then on the smooth.

BIOMARKERS AND THEIR DYNAMIC CHANGES ASSOCIATED WITH ACUTE RESPIRATORY DISTRESS SYNDROME, ACUTE KIDNEY INJURY AND DEATH IN COVID-19: PROSPECTIVE COHORT STUDY

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Objectives. An exceptionally high mortality rate of SARS-CoV-2 pneumonia is due to complications such as acute respiratory distress syndrome (ARDS) and acute kidney injury (AKI). New prognostic markers for deterioration of lung function, increased mortality rate, and development of AKI are constantly emerging. Most of the research done so far is based on cross-sectional data collection, and there are few dynamic studies evaluating patients using serial samples. We focus on novel and well-described biomarkers and their dynamic changes over time. Leucine-rich Alpha-2 Glycoprotein (LRG) is a novel acute phase protein included in our study, which as a perspective serum biomarker, has been studied in autoimmune diseases, fetal infection, acute appendicitis in children and kidney disease.

Materials and Methods. In a single-centered prospective cohort study, 60 patients with laboratory-confirmed SARS-CoV-2 pneumonia were included. Twenty-one biomarkers were measured in serial blood and urine samples on the first and fifth day of admission. Delta values were calculated and compared between groups of various outcomes – death, worsening of ARDS, and AKI.

Results. An increase in ferritin levels during the first five days was associated with the progression of ARDS, increased mortality, and AKI development, compared to widely used markers such as lactates, IL-6, CRP, procalcitonin, and others. If ferritin levels did not decrease during the first five days of hospitalization, the RR of in-hospital death was 5.36 (95% CI 1.87–15.50). The best prognostic value for death was observed in the PaO₂/FiO₂ ratio measured of fifth day with AUC 0.944 (p < 0.001). Serum LRG did not show any predictive value.

Conclusions. Increasing ferritin levels over the first five days of admission signal a poor outcome, and therefore, as an easy to use and universal marker, it should be taken into account in decision-making. Although serum LRG was not predictive, further studies are needed on its possible role in SARS-CoV-2 infection.

CHARACTERISTICS OF ENTEROCOCCUS RESISTANCE RATE AND PRESENCE OF VAN GENES IN RESISTANT CULTURES FROM TWO MULTIDISCIPLINARY HOSPITALS IN LATVIA

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Objectives. A common pathogen causing various infections is Enterococcus. It can cause various infections if migrating to other than gastrointestinal tract locations throughout a human body.

In majority of cases such infections are uncomplicated to manage, but problems arise if enterococci are becoming resistant against first line treatment.

In case of infections caused by a very resistant enterococcus, antibacterial agent vancomycin is administered. There is rising concerns about an increasing rate of resistance against vancomycin.

Van genes are responsible for enterococci resistance against vancomycin. There are 9 clusters of *van* genes discovered in decent decades: *vanA*, *vanB*, *vanC*, *vanD*, *vanE*, *vanG*, *vanL*, *vanM*, and *vanN*. The most common *van* gene in Europe is *vanA*, followed by *vanB* and *VanC* gene.

The aim of our study was to investigate Enterococcus samples, the rate of resistance against vancomycin and particular *van* genes presented in the case of such resistance.

Materials and Methods. Enterococci containing cultures from two multidisciplinary hospitals in Latvia were analysed. Full genome sequencing was performed with Illumina MiSeq, with a protocol of Illumina DNA Prep library. ResFinder data base was used to identify the resistance genes against vancomycin and other antibacterial agents. MS Excel program applied for performance of descriptive analysis.

Results. 120 samples were analysed. 86 samples contained *E. faecalis*, 49 – *E. faecium*, *E. durans* – 1, *E. gallinarium* – 1, and *E. raffinosus* – 1. 86 samples were sensitive, but 34 samples were resistant against vancomycin. Van genes A, B, C, and M were detected. *VanB* – in 25 samples (*E. faecium* – 18; *E. faecalis* – 7), *vanA* – 7 samples (*E. faecium* – 6; *E. raffinosum* – 1), *vanC* – 1 (*E. gallinarium*), and *vanM* in one sample (*E. faecium*). *E. faecalis* resistance rate was 10.29%, *E. Faecium* – 50%.

Conclusions. The most common resistance gene found in samples was *vanB* gene. The highest resistance rate against vancomycin was detected in *E. faecium*.

CLINICAL APPLICATION OF BACTERIOPHAGES IN COMPLICATED BIOFILM-ASSOCIATED INFECTIONS

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Objectives. The widespread presence of antimicrobial resistance and bacterial biofilm formation has dramatically increased the risk of antibiotic treatment failure. This has led to the search for alternative treatment strategies especially in complicated patient groups as immunosuppressed, polytrauma, and organ transplant patients. Reintroduction of bacteriophage therapy might be a solution in such cases. In recent years, several clinical cases have been reported where phages were successfully administered as last-minute treatment in case of antibiotic failure.

Materials and Methods. We present the current experience and treatment results of the scientific phage therapy group in Rīga Stradins university. Several patients in Latvia have been treated with bacteriophages, e.g., patients with multiresistant soft tissue infections and medical device-associated infections. Bacteriophage susceptibility was performed for each strain using spot assay. Bacterial characterization of antimicrobial susceptibility, biofilm formation and other characteristics was evaluated. We compared the results with other cases of phage therapy in relevant clinical situations.

Results. For several patients we have achieved complete bacterial eradication with phage therapy in whom biofilm-associated multiresistant bacterial infections were present. However, in some cases, relapses of infection were observed, and, in some patients, we were unable to provide phages due to lack of their lytic activity or lack of the desired lytic phage. Bacteriophage therapy was supplemented with antibiotics in case of susceptibility. The results of other clinical cases available in the SCOPUS and MEDLINE databases showed similar results.

Conclusions. In recent years, phage therapy has been used more widely. The main cause of using phages is the presence of bacterial multi-resistance, especially in complicated patient groups. For proper evaluation of phage therapy, randomized clinical trials are necessary.

COVID-19 VACCINATION STATUS AND SIDE EFFECTS IN ULCERATIVE COLITIS PATIENTS

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Objectives. Severe acute respiratory syndrome coronavirus 2 (COVID-19) vaccination is recommended for all individuals with inflammatory bowel disease (IBD), including those on immunosuppressive therapies; however, little is known about vaccination status, frequency and side effects safety and efficacy in IBD disease course.

Materials and Methods. In 6-month time (June 2021 to December 2021) 49 ulcerative colitis (UC) outpatients from Riga East Clinical University Hospital were included in a Cross-sectional study. All patients were divided into groups according to medically proven data about COVID-19 status (COVID-19+ vs COVID-19-) in the last 6 months. Information about vaccination status and complaints after vaccination were collected. Data were analyzed with SPSS 20.0.

Results. Out of 49 patients, 33 (63.3%) were males and 13 (36.7%) were females, mean age was 38.0 Md[Q1-Q3:34.0-51.0]. Most UC patients were vaccinated (23 (41%) males and 9(16%) females, $p = 0.000$). The most common vaccine was: Comirnaty (19(33.9%)) and Spikevax (7(12.5%)). Twenty-four (49%) patients had side effects after vaccination. Nineteen (38.8%) had side effects after the first vaccine, 6 (12.2%) after the second vaccine, and one (2.04%) – after the third vaccine. The most common side effects were local hyperemia in 22 (16 (28.6%) males, 6(10.7%) females), subfebrile temperature in 7(12.5%) males, and bone pain in 4 patients (3(5.4%) males, one (1.8%) female). The worst side effect after the first vaccination was pancreatitis (in one case), after 3rd: the first onset of UC (in one case). There was no statistical significance between age, gender, and side effects after vaccination. Fourteen patients (28.6%, 7(50%) in each gender) have been COVID-19 positive.

Conclusions. Most UC patients received the COVID-19 vaccine. The most common vaccine used among UC patients were Comirnaty and Spikevax. Males were vaccinated more often than females. Almost half of UC patients had a side effect after vaccination.

CYTOKINE PROFILE IN PATIENTS WITH PRIMARY ANTIBODY DEFICIENCY IN RESPONSE TO SARS-COV-2 ANTIGEN

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Objectives. An increased COVID-19 related morbidity and mortality has been reported in patients with primary antibody deficiencies. Immunization may therefore be particularly important in these patients. Specific cytokine signatures have been shown to be related to vaccine immunogenicity. Our aim was to investigate the cytokine profile that characterize the immune response to SARS-CoV-2 antigen *in vitro* in patients with primary antibody deficiency.

Materials and Methods. Study included 38 subjects: 31 patients with primary antibody deficiency and 7 healthy controls. We reviewed patient's clinical records to collect demographic and clinical data. QuantiFERON tubes were used for blood collection and sample incubation with SARS-CoV-2 spike-specific antigens or negative control for further analysis of IFN- γ production using an ELISA and IL-1 β , IL-4, IL-6, IL-10, IL-15, IL-17A, IL-21, TNF- α and TGF- β detection using xMAP technology.

Results. Of the 38 individuals (31.6% men; mean age 42.26, SD = 13.1), 28 patients and 7 controls had completed the vaccination regimen with a median time 164 (IQR = 114) days after vaccination. Overall, we found statistically significant increase in levels of INF- γ ($p < 0.001$), IL-10 ($p = 0.002$), IL-15 ($p = 0.008$), IL-17A ($p = 0.028$), IL-1 β ($p = 0.044$), but not IL-21 ($p = 0.756$), IL-4 ($p = 0.133$), IL-6 ($p = 0.795$), TNF- α ($p = 0.019$) and change in TGF- β ($p = 0.003$) levels following the SARS-CoV-2 antigen stimulation. The only statistically significant difference between the patient and control groups was observed in the change in TGF- β levels after stimulation with SARS-CoV-2 antigen ($p = 0.04$): TGF- β levels decreased by 167 pg/mL (median, IQR = 392) in the patient group and increased by 245 pg/mL (median, IQR = 724) in the control group. Differences in cytokine profiles were observed when comparing patient groups by comorbidities.

Conclusions. Patients with primary antibody deficiency show as rapid increase in both pro-inflammatory and antiinflammatory cytokine levels, following *in vitro* stimulation with SARS-CoV-2 antigen, however, cytokine profiles differ from those of healthy controls and between different comorbidities.

DIAGNOSTIC ACCURACY OF POTASSIUM HYDROXIDE SMEAR RELATIVE TO FUNGAL CULTURE – SINGLE CENTER EXPERIENCE

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Objectives. Rapid detection of dermatophytosis is key for timely initiation of treatment. Potassium hydroxide smear (KOH) remains an integral test for the rapid detection of dermatophytosis even with the prospect of modern mass spectrometry methods. The review of diagnostic accuracy of traditional methods is needed for an algorithmic approach to laboratory detection of dermatophytosis.

Materials and Methods. An observational cross-sectional study design was selected. The study enrolls 5568 cases of fungal diagnostic testing for suspected dermatophytosis. All fungal testing reports included both KOH smear microscopy and fungal culture and were performed in Riga East University hospital from October 2019 to October 2022. Fungal culture was selected as the reference standard method for the diagnostic accuracy comparisons.

Results. KOH smear microscopy was negative in 74.1% of the cases. Fungal culture was negative in 80.5% of the cases. Cultures found *Trichophyton* spp. in 17.7% of cases and *Microsporum* spp. in 1.8% of the cases. *Trichophyton rubrum* and *Microsporum canis* and *Trichophyton mentagrophytes* were the most common among positive fungal cultures, found in 82.5%, 6.9% and 4.7% respectively. KOH smear of *Trichophyton* spp. had a sensitivity, specificity, and accuracy of 87.1%, 88.1%, and 88.0%, respectively. KOH smear of *Microsporum* spp. had a sensitivity, specificity, and accuracy of 55.6%, 88.1%, and 87.5%, respectively. KOH smear microscopy in *Trichophyton* spp. cases had an AUC of 0.872 (CI95 0.859–0.886, $p < 0.001$). KOH smear microscopy in *Microsporum* spp. cases had a comparatively smaller AUC of 0.651 (CI95 0.587–0.715, $p < 0.001$).

Conclusions. KOH smear microscopy performed by experienced practitioners has considerable diagnostic accuracy for detection of dermatophytosis with the greatest sensitivity in *Trichophyton* spp. cases. An algorithmic approach including KOH smear microscopy, fungal culture and modern diagnostic methods is essential for the reliable diagnosis of dermatophytosis.

DIFFERENCES IN FECAL MICROBIOME DIVERSITY AND LIVER-RELATED MARKERS IN PATIENTS WITH CHRONIC HEPATITIS C, HIV, AND HIV/HCV COINFECTION

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Objectives. Liver fibrosis is a common consequence of chronic hepatitis C (HCV) and human immunodeficiency virus (HIV) infection, which is more intensive in patients with HIV/HCV coinfection. Impaired gut microbiome is among the pathogenetic mechanisms of liver fibrosis. The current study assessed fecal microbiome diversity, liver-related markers, and their interrelations in patients with HCV, HIV, and HIV/HCV coinfection.

Materials and Methods. The study included 81 treatment-naïve patients (47 men and 34 women) aged 18 to 65 (median age 44 years, IQR [37; 50]). There were 28 patients with HIV, 29 patients with HIV/HCV coinfection, and 24 patients with HCV. Liver injury was assessed by ALT, liver apoptosis marker as caspase-cleaved cytokeratin 18 fragment (CK18-M30) in serum (ELISA), and liver fibrosis index (FIB-4). The level of microbial translocation was assessed by lipopolysaccharide-binding protein (LBP) and soluble CD14 receptor in serum (ELISA). Bacterial profiles of stool samples were detected by sequence analysis of bacterial 16S rRNA genes, and Shannon diversity was calculated.

Results. Shannon diversity was higher in patients with HCV than in HIV and HIV/HCV coinfection. Patients with HCV had higher ALT and lower LBP than patients with HIV and HIV/HCV. CK18-M30 was higher in patients with HCV than in patients with HIV, but it was similar to HIV/HCV. Advanced liver fibrosis (FIB-4 ≥ 3.25) was detected in 4% of patients with HIV, 21% of patients with HIV/HCV, and 21% of patients with HCV. Shannon diversity correlated with ALT ($r_s = 0.35$, $p < 0.01$), CK18-M30 ($r_s = 0.24$, $p < 0.05$), LBP ($r_s = 0.31$, $p < 0.01$) and sCD14 ($r_s = -0.37$, $p < 0.001$).

Conclusions. Patients with HIV and HIV/HCV had a lower diversity of fecal microbiome and a higher microbial translocation than patients with HCV despite more intensive liver inflammation and apoptosis before treatment that highlight the role of the impaired gut microbiome in the pathogenesis of liver fibrosis in patients with HIV.

DYSREGULATED B CELL RESPONSES IN IGA NEPHROPATHY

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Objectives. IgA nephropathy (IgAN) is the most common primary glomerulonephritis worldwide with an incompletely understood aetiology and mechanisms of pathogenesis. Despite characteristic deposition of IgA-containing immune complexes in the kidney that indicates aberrant B cell function, an in-depth characterisation of B cell activation and its association with renal function is yet to be carried out; here we address this gap in knowledge.

Materials and Methods. We recruited individuals with renal biopsy-confirmed IgAN (n = 68) at the Nephrology Centre of Pauls Stradins Clinical University Hospital; collectively these patients had a range of renal function – from normal to severe kidney damage. Age- and sex-matched healthy individuals (n = 23) were recruited as controls. Peripheral blood mononuclear cells were isolated by density gradient centrifugation and analysed with fluorescently-labelled antibodies against surface markers CD19, CD27, IgD, CD38, CD24. These markers allowed us to determine the peripheral blood frequencies of antigen-inexperienced B cells (IgD⁺CD27⁻), including transitional (CD24^{int}CD38^{int}) and mature naïve (CD24^{int}CD38^{int}) B cells. We also determined the composition of the antigen-experienced B cell compartment – unswitched (IgD⁺CD27⁺), switched (IgD⁻CD27⁺) and double negative (IgD⁻CD27⁻) B cell subpopulations. IgA, CXCR5, CD11c, CD43 and CD1d surface markers were used to gain further functional insight of the subsets. Data analysis was done with FlowJo and GraphPad Prism software version 9.2.0.

Results. Unique B cell profile characterises patients with IgAN. We observe a marked increase of naïve (IgD⁺CD27⁻) and a reduction of unswitched memory (IgD⁺CD27⁺) B cells; this dysregulation in the B cell compartment is particularly pronounced in individuals with more severely impaired renal function. Of note, we did not observe an expansion of double negative (IgD⁻CD27⁻) B cells previously associated with pathogenic antibody production in systemic autoimmunity.

Conclusions. IgAN is associated with aberrant B cell activation, future studies will address the mechanisms that enable this dysregulation, including importantly microbiota-derived signals. Funded by Latvian Council of Science (lzp-2019/1-0139).

EBV INFECTION AND DISEASE PROGRESSION CELL-SURFACE MARKERS IN LATVIAN COHORT OF UNTREATED PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA

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Objectives. Epstein Barr virus (EBV) is a human virus implicated in oncogenesis of various lymphomas and associated with autoimmune complications. Previously, we demonstrated that EBV infection of B cells induces expression of the chemokine receptors CCR1 and CCR2. Since 2008, WHO classifies chronic lymphocytic leukemia (CLL), a major type of adult leukemia, as a B-cell NHL. The aim was to assess in untreated CLL patients a relationship between the EBV infection and expression of the cell-surface markers, CCR1, CCR2, and known negative prognostic CD38.

Materials and Methods. The EBV DNA viral load in PB cells was determined using commercial quantitative PCR kit (detection limit: 5 copies/10⁵ cells). mRNA expression of the EBV latent genes, EBNA2, LMP1, and LMP2A, we also examined. We compared the frequency of the CD38-, CCR1-, and CCR2-expressing PB lymphocyte populations, using multiparameter flow cytometry, in 23 EBV-positive and 24 EBV-negative untreated CLL patients. The study was funded by the projects: LZP No.lzp-2018/1-0156 and RSU No.6-ZD-22/14/2022.

Results. Three patients only had the high viral load exceeding 200 EBV DNA copies/10⁵ PB cells, two of them were with the moderate frequency and one with > 30% of the CD38+ leukemic lymphocytes. The EBV oncogene LMP1 transcription was determined in 3 out of 23 EBV positive patients. Surprisingly, the viral load in these patients was only 6–7 copies/10⁵ cells. The all 3 LMP1-expressing patients were CD38-positive (> 30% of CLL cells). In patients co-expressing LMP1 and EBNA2, CCR1 and CCR2 were also presented on > 30% of the CD19+CD5+ lymphocytes.

Conclusions. Expression of the EBV oncogene LMP1 in PB cells is linked to expression of the negative prognostic marker CD38 and to the increased number of the CCR1- and CCR2-expressing leukemic cells. CCR1/CCR2 on CLL cells can promote dissemination of these cells through the body thus contributing to progression of the disease.

ECHINOCOCCOSIS RISKS FACTORS IN LATVIA AND NEIGHBOURING COUNTRIES

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Objectives. To describe risk factors that can promote infection with *Echinococcus* spp. And to compare Latvian data with it from neighbouring countries.

Materials and Methods. In order to ascertain the risk factors of the disease, a questionnaire was carried out on echinococcosis and echinococcosis-free patients on possible risk factors for the disease. Analysis of literature about risk factors in neighbouring countries to Latvia was done.

Results. In Latvia, statistically significant risk factors for echinococcosis were: 1) living in a rural household, particularly for a long time; 2) dogs and cats have been owned; 3) dogs and cats live unattended and have eaten small rodents or internal organs of slaughtered animals; 4) the fact that they owned livestock; 5) the fact that there are hunters in family. Literature analysis in PubMed revealed 2 publications from Lithuania, 3 from Russia and no reliable data about Estonia and Belarus.

Conclusions. It must be mentioned that literature data on the development of echinococcosis and epidemiological factors of patients are limited and in the PubMed database only few could be used, as well as, for some studies, the original publications themselves is not available.

EFFECTIVENESS OF TBE VACCINATION IN LATVIA IN 2018–2020

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Objectives. Tick-borne Encephalitis (TBE), a central nervous system infection by the Tick-borne Encephalitis virus (TBEV), is endemic in Latvia and elsewhere in Europe and Asia. TBE can result in death and other severe consequences. In Latvia, TBE vaccination is strongly recommended, and partially government-reimbursed for children 18 years of age, but TBE vaccine effectiveness (VE) for various TBEV infection outcomes has not been estimated.

Materials and Methods. Rīga Stradiņš University conducted nationwide population-based surveillance for TBEV-infected cases in collaboration with the Centre for Disease Prevention and Control, the National Reference Laboratory, and 15 hospitals. Serum and cerebrospinal fluid were tested by ELISA for TBEV-specific IgG and IgM antibodies. After informed consent, TBE vaccination history was collected by interview and medical record review. VE (with 95% confidence interval) was estimated using the screening method utilizing vaccine uptake data from population surveys conducted by IPSOS in 2019 and 2020.

Results. From 2018–2020, surveillance identified 716 TBEV-infected cases, 587 of which according to ECDC case definition were classified as TBE cases. 98% (576) of TBE cases were unvaccinated, but 0.3% (2) were fully-vaccinated (on-schedule receipt of all doses).

In the IPSOS general population surveys in 2019–2020 56.5% of general population had received at least 1 or more TBE vaccine doses, 24.2% were fully-vaccinated. VE with ≥ 3 doses against laboratory confirmed TBE with hospitalization was 99.5% (97.8–99.9), against TBE with moderate or severe disease was 99.2% (94.6–99.9) and against TBE with hospitalization > 12 days as well 99.2% (94.0–99.9). There were 364 TBE virus-infected and 302 TBE cases prevented by TBE vaccine per year.

Conclusions. For the first time, study of TBE VE against different infection and disease outcomes was performed and both EU registered TBE vaccines have shown a very high effectiveness in Latvia.

EFFECTS OF SARS-COV-2 INFECTION ON CARDIOVASCULAR SYSTEM

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Objectives. This review assesses the risk of cardiovascular complications in the course of SARS-CoV-2 infection.

Materials and Methods. For this review, the author searched PubMed and Google Scholar for scientific articles using the keywords "cardiovascular complications", "SARS-CoV-2", "COVID-19", "acute coronary syndrome", "thromboembolic complications", "coagulopathy", "dysrhythmias", "endotheliopathy". The author studied 44 scientific articles focusing on COVID-19 and cardiovascular complications caused by it. This included case reports, retrospective studies, prospective studies, systematic reviews, meta-analyses and clinical guidelines.

Results. Based on the processed literature, was concluded that myocardial injury with elevated troponin levels occur in 7-17% of those hospitalized with a diagnosis of COVID-19, and in 22-31% of patients interned in the intensive care unit. The risk of myocardial infarction, in patients with SARS-CoV-2 infection ranges from 1.1% to 8.9%. Based on some studies, palpitations can occur in 7% of patients with COVID-19, and the overall percentage of arrhythmias reaches 17% in cases of patients hospitalized with COVID-19 and up to 44% of ICU patients. An increased risk of fatal outcomes associated with venous thromboembolism, including pulmonary artery thromboembolism, has also been identified. A study of COVID-19 patients' derma bioptic samples analyzed through histologic, immunofluorescent and immunohistological methods, showed that endothelitis was present in 65% of cases.

Conclusions. This review of the literature indicates that SARS-CoV-2 infection is not only associated with the risk of respiratory complications, but also, in a large number of cases, may lead to cardiovascular complications such as myocardial injury, myocardial infarction, arrhythmias, thromboembolic complications, and vascular lesions. Clinicians should take these facts into consideration when prescribing treatment to reduce morbidity and mortality from cardiovascular complications.

EPSTEIN-BARR VIRUS IN MULTIPLE SCLEROSIS

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Objectives. Multiple sclerosis (MS) is central nervous system disease manifesting with chronic inflammation and neurodegeneration, affecting nearly three million people worldwide. Epstein-Barr virus (EBV) worldwide prevalence in at least 90% of adult population and it is capable to establish lifelong latency. MS aetiology is complex and multifactorial, involving genetic and environmental factors, such as viral infection.

The aim of this study was to clarify current evidence on EBV involvement in MS to analyse role of EBV infection in relapsing remitting MS (RRMS).

Materials and Methods. Literature analysis was performed to gather latest information on EBV involvement in aetiology and pathogenesis of MS. Determination of EBV infection markers in peripheral blood mononuclear cell/ cerebrospinal fluid (CSF) samples will be performed using multiplex and reverse transcription real-time polymerase chain reactions (PCR). The presence of virus-specific immunoglobulin (Ig)G and IgM antibodies in the serum and CSF of MS patients will be measured using enzyme-linked immunosorbent assays (ELISA).

Results. Research results on epidemiology, virology and serology display presence of EBV infection in patients with MS. The mechanisms on the infection are demonstrated by number of peer-reviewed publications, associating abnormalities in MS with viral infection. EBV is stated a significant risk factor developing MS.

Study results will show presence of virus-specific IgG and IgM antibodies, as well as viral load and activity phase of EBV in patients with RRMS in Latvia.

Conclusions. EBV is one of infectious agents having role in MS, possessing as a risk factor for developing MS that is demonstrated in several published studies which needs to be investigated in Latvian patients with RRMS.

ESKAPE PATHOGENS ANTIMICROBIAL RESISTANCE IN LIEPAJA REGIONAL HOSPITAL INTENSIVE CARE UNIT, 2022

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Objectives. The acronym ESKAPE includes six nosocomial pathogens that exhibit multidrug resistance and virulence: *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacter* spp. The aim of the study was to analyze the incidence of ESKAPE pathogens and antimicrobial resistance (AMR) at the intensive care unit (ICU) of Liepaja Regional Hospital (LRS) in 2022.

Materials and Methods. From 22.07.2022. till 11.01.2023. were recruited 51 LRS ICU patients: male – 27, female – 24. 96 ESKAPE pathogens were identified (*A.baumannii* – 31/96 (32%), *Paeruginosa* – 25/96 (26%), *K.pneumoniae* – 13/96 (14%), *E.coli/E.cloacae* – 11/96 (11%), *S.aureus* – 10/96 (10%), *E.faecium* – 6/96 (6%)). AMR testing were performed with phenotypic methods according EUCAST recommendations. Sample's materials were bronchoalveolar lavage – 43, tracheal aspirate – 15, urine – 14, blood – 8, wound samples – 6, central line tip – 3, intraoperative abdominal sample – 3, nasal sinus puncture – 1, abdominal drainage fluid – 1, bile sample – 1, nasopharyngeal swab – 1.

Results. In this review we assessed the current state of AMR in ESKAPE pathogens. All *A. baumannii* samples were multidrug-resistant and carbapenem-resistant (CRAB), two of which were pandrug-resistant isolates with no effect to polymyxin-class antibiotics. *P. aeruginosa* displayed resistance to multiple classes of antibiotics, with 20% sample's resistance to carbapenems. *E. cloacae* showed resistant to aminopenicillins and 4th generation cephalosporins. *E. coli* displayed resistance to aminopenicillins (50%), 3rd generation cephalosporins (20%) and fluoroquinolones (10%). There wasn't found carbapenem-resistant *K. pneumoniae* (CRKP) strains. Methicillin resistance in *S. aureus* – 20%. Vancomycin-resistant *E. faecium* (VREfm) – 33%.

Conclusions. Most frequently isolated pathogens – *A.baumannii* and *Paeruginosa* – showed expansive multi-drug resistance mechanisms, that, with the rise of VREfm strains, show an emerging area of concern from nosocomial infections. Findings recommend further research, including genomic testing.

EXPERIENCE IN HCV DRUG RESISTANCE TESTING

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Objectives. Efficacy of hepatitis C virus (HCV) infection treatment with interferon-free, direct-acting antivirals (DAA)-based combination therapies can be reduced by pre-existed or emerged mutation in HCV genome. The aim of the study is to analyse HCV resistance-associated substitutions (RASs) in patients' failed therapy with combination of DAAs.

Materials and Methods. Overall 44 patients after virological treatment failure were included in study: 30 men, 14 women, median age 58 years, 15/44 with HIV-1 coinfection. Median HCV viral load was 5.1 E5 IU/mL, HCV genotypes distribution was as follows: GT1a-6/44, GT1b-18/44, GT3a-16/44, GT2-2/44, GT4-2/44. For HCV variants resistant to NS3 Protease inhibitors, NS5A Phosphoprotease inhibitors and NS5B Polymerase inhibitors detection, HCV RNA isolation from plasma, amplification of three corresponding HCV genome regions, next-generation sequencing (Deep Cheek® HCV ABL kits, Illumina Iseq100 analyser) was performed. RASs were determined according to Geno2Pheno 0.92 virologic tool, with 15% cutoff.

Results. Significantly, DAAs susceptibility reduced RASs, were detected in 34 of 44 patients (77%). Most often NS5A RASs were detected (28/44, 64%), followed by NS3 RASs (20/44, 45%) and NS5B (6/44, 14%). From NS5A RASs- Y93H (18/28), L31M (12/28), A30K (5/28), Q30R (4/28) were present. Detected NS3 RASs were as follows: N174S (5/20), Y56F/H (6/20), D168V/A/T (6/20). Detected NS5B were S556G (3/6), L159F (3/6), M414I (1/6). According to Geno2Pheno interpretation, NS5A RASs lead to full resistance to one or more drugs in 27/44 patients, to intermediate (reduced) resistance in 1/44 patients. NS3 RASs lead to full or intermediate HCV resistance in 10/44 and 10/44 patients respectively; NS5B in 4/44 and 2/44 patients respectively.

Conclusions. Analysis has shown different mutations in specifically analysed HCV genes (NS3, NS5A and NS5B) in 77% patients with DAAs treatment failure in history. Most often clinically significant HCV NS5A RASs were found (28/44, 64%). These mutations can persist for > 1 years after treatment discontinuation and affect the results of re-treatment. HCV genotyping for RASs detection can be used as a tool for optimal DAAs regimen choosing.

FIRST RESULTS OF USING GENOME SEQUENCING IN DISCOVERING THE MOLECULAR CAUSE OF PRIMARY IMMUNODEFICIENCIES

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Objectives. Primary immunodeficiency disorders (PID) result from altered, poor, or absent function in one or more components of the immune system, that cause increased frequency and severity of infection, autoimmunity, aberrant inflammation, and malignancy in affected individuals. The understanding of the genetic heterogeneity of PID has expanded greatly over the last decade. Although next generation sequencing approach became more available still diagnostic yield for exome in PID is ranging from 15 – 70% depending on the study.

Aim of the study. To enroll clinically diagnosed PID patients and with genome sequencing to identify the molecular cause.

Materials and Methods. 96 individuals (probands and their relatives) with clinically diagnosed PID enrolled in the study. For 14 patients performed genome sequencing where analyzed nucleotide variations and copy number variations in the selected gene panel from PanelApp browser related to PID following ACMG pathogenicity criteria.

Results. Three patients identified molecular causes for PID in genes *NRAS*, *SH2D1A*, *NR2F1*. For one patient identified deep intronic variant, other complex structural variation would be missed if exome analysis would be performed. Two patients with identified variants of unknown clinical significance in genes *NLRP1*, *MPO*. Seven patients remain without identified genetic causes related to PID.

Conclusions. Genome sequencing allows for an increase in diagnostic yield in PID.

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GUT MICROBIOME DIFFERENCES BETWEEN PATIENTS WITH COLORECTAL ADENOMAS AND HEALTHY INDIVIDUALS

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Objectives. One of the factors in the development of colorectal cancer (CRC) is the gut microbiome. Its effect on promoting colon pathology occurs both through the microorganisms themselves and their metabolites. It is known that the most common pathway of CRC development is the adenoma-carcinoma; therefore, research is needed not only on the relationship of CRC with changes in gut microbiome composition, but also to specify whether the presence of CRC precursors – benign colon adenomatous polyps could be early associated with changes in the composition of the gut microbiome.

The aim of our study was to determine whether the composition of the gut microbiome was different in individuals with colon adenomas detected during colonoscopy examination compared to individuals without adenomas.

Materials and Methods. Fecal samples were collected from 48 patients with colorectal adenoma (AD) and 74 healthy controls. Gut microbiome composition was determined using a 16S rRNA gene sequencing approach. Differential abundance testing was performed by the Linear discriminant analysis effect size (LefSe) tool.

Results. The most pronounced bacterial discriminants of the AD group include the genus *Mediterraneibacter*, previously described as associated with colorectal cancer[1], and the species *Carnobacterium divergens*. Healthy individuals were characterized by an increase in representatives of *Alistipes*, *Akkermansia*, *Odoribacter*, *Lactococcus*, *Anaerotignum*, and *Coprobacter*.

Conclusions. Significant differences in the gut microbiome composition have been detected between patients with colorectal adenomas and healthy individuals, indicating potential microbiome-related changes at the early stages of colorectal cancer development.

HLA CLASS ALLELES ASSOCIATED WITH EPITHELIAL CELL DAMAGE AND EXTRACELLULAR MATRIX PRODUCTION IN ACUTE COVID-19

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Objectives. The genetic influence on the COVID-19 course has not yet been fully explored. Human Leukocyte Antigen (HLA) genes encode HLA I and II molecules that bind to antigen peptides and present them to T lymphocytes, playing an essential role in regulating the host's immune response. Previous studies suggest intense epithelial tissue damage and active extracellular matrix (ECM) formation in severe COVID-19. Our study aimed to determine the association of HLA Class II alleles with full-length cytokeratin 18 (CK18), caspase-cleaved CK18 fragment M30 (CK18-M30), and hyaluronic acid (HA) in serum as markers of epithelial cell necrosis, apoptosis, and ECM formation, respectively.

Materials and Methods. The study included 101 patients with COVID-19 hospitalized during the autumn of 2020. Routine clinical tests were performed at admission to the hospital. Serum levels of CK18, CK18-M30, and HA were determined by ELISA. HLA typing was performed in HLA-DRB1, -DQA1, and -DQB1 loci by a real-time polymerase chain reaction. COVID-19 severity was determined according to the World Health Organization definition.

Results. Patients with severe/critical COVID-19 had higher levels of CK18, CK18-M30, and HA than patients with the nonsevere disease course. Patients with HLA-DQB1*03:01 had a lower level of CK18-M30 than patients without it (207.0 U/L vs. 240.0 U/L, $U = 647.5$, $p < 0.05$). Patients with the HLA-DRB1*04 allele had a lower level of HA than patients without it (49.8 ng/mL vs. 81.2 ng/mL, $U = 610.5$, $p < 0.05$), but the presence of HLA-DRB1*12 in genotype was associated with a higher level of HA (320.0 ng/mL vs. 66.1 ng/mL, $U = 62.0$, $p < 0.05$).

Conclusions. HLA Class II alleles can affect the level of epithelial cell apoptosis and ECM production associated with severity during acute COVID-19.

HUMAN HERPESVIRUS 6 – VIRUS OF AUTOIMMUNITY?

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Objectives. Human herpesvirus 6 (HHV-6) is an ever-present human pathogen with several intriguing characteristics – immunomodulatory properties, latency establishment, reactivation and persistence, and broad tissue tropism, leading researchers to investigate this virus's role in autoimmunity development. Over the years, studies have accumulated evidence implicating HHV-6 in various autoimmune conditions – connective tissue, neurological and endocrine. This review summarizes the accumulated knowledge on HHV-6 and autoimmunity.

Materials and Methods. We searched PubMed for relevant studies regarding HHV-6 and various most common autoimmune conditions, e.g. multiple sclerosis, systemic sclerosis, rheumatoid arthritis, autoimmune thyroiditis etc.

Results. The reviewed studies demonstrated that HHV-6 DNA, mRNA, and HHV-6 specific antibodies could be more frequently detected in autoimmune disease patients in the case of several autoimmune conditions. HHV-6 presence was found in autoimmunity-affected tissues – the nervous system in the case of multiple sclerosis, the thyroid gland in the case of autoimmune thyroiditis, synovial tissues in the case of rheumatoid arthritis, and most recently in the pancreas of diabetes patients. For some diseases (multiple sclerosis, autoimmune thyroiditis, etc.) autoimmunity-triggering mechanisms have even been proposed.

Conclusions. Studies have demonstrated the relevance of HHV-6 in the context of autoimmunity – it has been detected in autoimmunity-affected tissues, it has been shown to infect autoimmunity-relevant cells, changing their functionality or lysing the cells, and it has been shown to promote an inflammatory state and alter immune responses. Although much has been studied, more research is necessary to demonstrate the mechanisms and undoubtedly consolidate HHV-6 as a virus of autoimmunity.

HUMAN LEUKOCYTE ANTIGEN CLASS II ALLELES IN HIV-POSITIVE PATIENTS WITH PRIMARY SKIN PATHOLOGIES AND IN CONTROL GROUP IN LATVIA

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Objectives. HIV-infected patients typically exhibit unusually dry skin and may present inflammatory or eczematous eruptions like primary skin pathologies (PSP). These include atopic dermatitis, seborrheic dermatitis, psoriasis, pruritic papular eruption of HIV, eosinophilic folliculitis, papular urticaria, prurigo nodularis. At the same time HLA diversity can influence on the likelihood of manifestation of PSP in HIV-infected patients. Evaluation of innate immunity defects in these patients is possible with HLA class II allele typing.

This study assessed the distribution of variants of HLA Class II alleles in patients with HIV and PSP within the Latvian population.

Materials and Methods. There were 70 patients aged 34 to 72 years in our test sample, of whom 22 (31%) were females and 48 (69%) were males. 62 patients (88%) had tuberculosis. All patients in our sample had HIV and PSP. To determine risk alleles of the HLA Class II gene, HLA-profiles of a control group of 80 adults (various age and sex, no HIV) was created.

Results. When comparing the distribution of HLA-DRB1/DQA1/DQB1 alleles in our test and control groups it was found that the alleles HLA-DRB1*04:07,01:15, 04:12,13:17, HLA-DQA1* 0103:0501, 0101:0501, 0102:0301 and HLA-DQB1*0401-2:0401-2, 0301:0302, 0301:0401-2, 0501:0602-8 are more represented in the test group, these alleles are identified as risk alleles for manifestation of PSP in HIV patients. HLA-DRB1*07:13, 01:13, 11:13, HLA-DQA1*0101:0101, 0101:0102, 0501:0501 and HLA-DQB1*0201-2:0301, 0301:0602-8, 0301:0301 were identified as protective alleles.

Conclusions. Our findings indicate that the HLA class II alleles -DRB1, -DQA1 and -DQB1 are associated with a trend to risk/protection relating to PSP in HIV patients. Further research is needed to determine the protective and risk alleles of HLA class II for these patients in Latvia. HLA class II allele typing can provide additional information for the prognosis of PSP in HIV patients and monitoring its treatment.

IMPACT OF SARS-COV-2 VIRUS DURING THE STATE OF EMERGENCY ON THE QUALITY OF RESIDENCY PROGRAMME OF FAMILY MEDICINE IN LATVIA

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Objectives. To prove hypothesis that family medicine residents suffered in quality of residency program while working in the state of emergency with SARS-CoV-2 (C19) patients.

Materials and Methods. Multiple-choice questionnaires completed by residents. Survey data analysis in SPSS, Microsoft Excel.

Results. From 140 family medicine (FM) residents 71 (50.7%) participated in the survey, from whom 67 (94%) worked with C19 patients, two of residents took academic leave (3%), but two were on academic leave due to paternity leave (3%).

42 of GP (62.7%) residents were involved more than 8 weeks out of their rotation cycles (RC), 33 (49.3%) of the residents worked extra hours, mostly 24–48h in a month (41.8%)

Residents worked dispersed during the period – 42 (62.7%) were working in hospitals with C19 patients who had moderate severity of symptoms and with patients in intensive care units, but 25 (37.3%) worked only in outpatient clinics.

46 (68.7%) of the residents had to assimilate their rotation cycles (RC). Most common were Internal Medicine (32.8%) and Pediatrics (23.9%) but involved up to 15 different RC.

FM residents were asked to answer questions about their opinion on their thoughts:

- If they gained big experience while working with C19 patients, for which strongly agreed 9% of respondents, 28.4% agreed, but 43.3% of GP residents were neutral.
- If they feel that their quality of residency program has lost its value, for which strongly agreed 23.9% of respondents, 17.9% agreed, but 35.8% of GP residents were neutral.

Conclusions. Resident opinion varies while there were no significance nor correlation between factors which may involve the outcome of their thoughts. This reveals that it depends on each individual how competent they feel on different medical fields afterwards.

IMPACT OF THE SARS-COV-2 PANDEMIC ON CLINICAL MANIFESTATIONS AND NEUROPHYSIOLOGICAL FINDING OF GUILLAIN-BARRÉ SYNDROME

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Objectives. Despite the fact that SARS-CoV-2 pandemic has ended, the long term impact data is still scarce. Guillain-Barré syndrome is an autoimmune disease that can develop after infections, including respiratory viruses. The impact that SARS-CoV-2 has on nervous system is still unclear, so this research aims to provide insight – has COVID-19 pandemic changed Guillain-Barré syndrome?

Materials and Methods. Patients hospitalised in PSKUS in the time period from 2018 to 2022 and discharged with diagnosis Guillain-Barré syndrome were included in the research (2018 to 2022 were categorised before the pandemic, 2021 and 2022 – after). Biometrical data, clinical presentation, cerebrospinal fluid analysis and electrophysiological findings on total 19 patients were gathered.

Results. On average in the span of one year 4 patients were admitted before, and 3.5 after the start of COVID pandemic. On average before COVID patients were 55.5 years old, mostly men (woman 16.6% (N = 2), men 83.4% (N = 10)), while after – on average 52 years old, 57.1% women (N = 4). After the start of the pandemic for one of the patients the trigger behind Guillain-Barré syndrome was identified as ARVI, and only one of the patients had proven connection with SARS-CoV-2 – virus was contracted after admission in PSKUS. No significant difference was found between clinical Guillain-Barré syndrome presentation and neurophysiological findings. Even after the pandemic electroneurographic studies were still conducted to majority of patients.

Conclusions. Further research on relations between SARS-CoV-2 and Guillain-Barré syndrome is needed. The main focus on additional studies will be patients with the same diagnosis in RAKUS, electrophysical data and vaccination status.

IMPORTANCE OF HELA CELLS IN MODERN MEDICINE

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Objectives. Presenting to young researchers the information about HeLa cells and their importance in different branches of modern medicine.

Materials and Methods. PubMed database was used and the keywords „HeLa cells” were searched. We focused mainly on 2012–2022 period and, therefore, 44,671 results were determined.

Results. HeLa cells is the oldest and most widely used cell line in the world. It is well-known the importance of HeLa cells in the modern medical fields, such as: molecular biology, human genetics, sexual and reproductive health (HPV and cervical cancer, HIV infection and AIDS), COVID-19 infection, etc. HeLa cells are particularly important in medical bioethics and deontology, being an important aspect in the development of the concept of informed medical consent. The complexity of the topic is reflected in the large number of existing bibliographic sources, through which young researchers can learn about the importance of HeLa cells. The contribution, in various fields, has been appreciated including the extension of the number of sources, with the association of “molecular biology”, “human genetics”, “human papilloma virus”, “HPV virus”, “cervical cancer”, “human immunodeficiency virus”, “HIV”, “acquired immune deficiency syndrome”, “AIDS”, “COVID-19” expressions, being obtained approx. 1235 sources.

Conclusions. The importance of HeLa cells and their involvement in various fields of medicine is demonstrated by the large number of data. Studying them helps to inform young researchers with some of the most important concepts in contemporary medicine.

INTERACTION OF ANTIBIOTICS AND BACTERIOPHAGES IN BACTERIAL BIOFILMS

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Objectives. The increasing resistance to antibiotics has become one of the most important global health care problems. The ability of bacteria to form a biofilm is an important resistance mechanism. Studies indicate that bacteriophages can be used as an alternative to antibiotics or as combination with antibiotics with some limitations. The effect of combined therapy can be synergistic, additive, or antagonistic, which is directly related to the mechanism of action of both antibacterial agents.

Materials and Methods. Evaluation of bacterial strains isolated from patients and reference strains were used. Lytic phages and antibiotics were used as antimicrobial agents. The antibacterial sensitivity was determined using disk diffusion test and broth microdilution test to detect minimum inhibitory concentration (MIC). Formation ability was determined by the Crystal violet assay. Bacterial susceptibility to phages was evaluated according to the spot test. The MIC and minimum biofilm eradication concentration (MBEC) of phages and antibiotics were determined with a Calgary device.

Results. Phage and antibiotics can be used as separate therapies that can follow each other or combined together simultaneously. The sources of the literature and the results obtained in our study show that the order in which the therapy is used is essential: the best effect is observed if the phages are used first and antibiotics are applied only afterward. The interaction of antibiotics and phages should be assessed and may vary according to action mechanism of antibiotic and phage-bacterium interaction.

Conclusions. Bacteriophages and antibiotics can enhance each other's effects if the combination is used appropriately, but they can also act as antagonists. Such combinations can be used as alternatives in cases of multidrug-resistant bacteria, but each situation must be evaluated individually.

INTRODUCING NOVEL DIAGNOSTIC METHOD FOR DETECTING NATURAL-ONLY TICK-BORNE ENCEPHALITIS VIRUS INFECTIONS: CURRENT CHALLENGES AND FUTURE PROSPECTS IN LATVIA

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Objectives. To evaluate newly established diagnostic method in Tick-borne encephalitis (TBE) diagnostics (NS1 ELISA), that detects antibodies against the TBE virus non-structural protein 1 (NS1), which is exclusively indicative for virus replication in natural infection.

Materials and Methods. Study population includes patients with acute and confirmed TBE diagnosis of seasons 2020-2021 in Latvia. Written informed consent was obtained for all participants prior to enrolment. Further serum sample was tested with traditional ELISA TBE-specific IgM and IgG antibodies in the serum and with newly developed NS1 ELISA. This method detects TBE-specific NS1 IgG antibodies based on TBE virus European subtype.

Results. Total of 129 patients with acute TBE were included in the study. Serological testing by traditional ELISA confirmed TBE-specific IgM antibodies in the serum in 126 patients (98.4%) and IgG antibodies in 123 patients (96.1%). Detection of TBE-specific NS1 IgG antibodies by NS1 ELISA was observed in 10 (7.8%) of acute TBE patients. Median time of testing – 7 days since onset of TBE neurological symptoms. Negative NS1 ELISA results were observed more frequently in eastern part of Latvia, where also TBE virus Siberian and Far-Eastern subtype circulate – 67% versus 48% in western part.

Conclusions. Published results clearly show that detection of TBE-specific NS1 antibodies is proved as highly sensitive and specific tool for diagnosing TBEV infections. Moreover, it is not affected by TBE vaccination. Although NS1 ELISA sensitivity in TBE patients in Latvia was low, future investigations will be done to address issues on possible test limitations – other subtype discrimination that also circulate in Latvia and too early tested samples.

INVASIVE PNEUMOCOCCAL DISEASE EPIDEMIOLOGY IN LATVIA, 2017–2021

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Objectives. Laboratory confirmed IPD cases are passively notified to the Centre for Disease Prevention and Control of Latvia (CDPC) by laboratories and clinicians.

Materials and Methods. We calculated incidence by age, sex, case fatality, and trend in serotypes by conducting a retrospective population-based study based on national IPD surveillance data.

Results. From 2017 to 2021 371 cases of IPD were reported, including 17 (4.6%) cases reported in age 0–17. The total mean IPD cases during five years are 74.2 cases per year (3.9/100,000). The highest notified incidence was in 2018 at 4.3/100,000, which fell to 3.5 in 2020. The highest mean annual IPD incidence was in infants (7.2) and in the elderly (8.0).

95% (351/371) of all *S.pneumoniae* IPD cases were serotyped. PCV10 vaccine serotypes has a decreasing trend from 27% in 2017 to 17.4% in 2021. PCV13 vaccine serotypes had an increasing trend and rose from 16.2% in 2017 to 36% in 2021 aspatially in children (aged 0–17) and elderly (aged ≥ 65). The most common serotypes among all patients are 19A (13%, 46/351), 3 (12.8%, 45/351) and 8 (11.4%, 40/351).

Total case fatality rate in study period was 16.2% (57/371) with the highest in elderly (aged ≥ 65) 16.7% (26/155). The highest case fatality 21.4% was in 2021. 21% (12/57) of all *S. pneumoniae* death from IPD was associated with serotype 19A.

Conclusions. Surveillance data indicate the importance to change the vaccine in the schedule from PCV10 to other including more *S.pneumoniae* serotypes.

KAPOSI'S SARCOMA IN HIV-INFECTED PERSON IN REPUBLIC OF MOLDOVA

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Objectives. Keywords: HIV, AIDS, Kaposi's sarcoma, antiretroviral treatment

Introduction: Kaposi's sarcoma (KS) is an angioproliferative viral disorder of the vascular endothelium, associated with advanced HIV-infection. The most affected site are skin (painless lesions as macules, papules and nodules of red, purple, violaceous, and dark brown or black color), mucosal surfaces, respiratory tract, and lymph nodes.

Case description: A 37-year-old man, reported with fatigue, multiple violaceous papules and nodules on his trunk, arms and legs, productive cough, fever, 10-15 kg weight loss for 2 months. Patient was HIV positive since 2014, by unprotected heterosexual exposure, no history of blood transfusion, injection drug use, or needle sharing, without antiretroviral treatment (ART) before. On examination, the patient was severe, alert, oriented but emaciated, lung examination: diminished breath sounds bilaterally with no other alterations, SaO₂ 97%. The lab results: hemoglobin 71 g/L, WBC 6,200/uL, lymphocytopenia 1100/uL, ESR 68 mm/h, CD4-36 cells/mm³, ARN HIV-789000 copies/mm³, normal renal function, no cytotolestase (total bilirubin 3.5 mmol/L, ALT - 15.4 U/L, AST - 61.8 U/L), Western Blot for syphilis - positive. Chest X-ray: hypotransparency bilateral, predominant of the right lower lobe. KS diagnosis was confirmed by skin biopsy. Patient was hospitalized for 2 months; ART was started with TDF+FTC+EFV and symptomatic treatment, but without an effective response, with worsening of the general condition, followed by death. Pathomorphological diagnosis was KS with polyorgan failure.

Summary: The clinical manifestations in our patient show aggressive course of KS in HIV-infected patients. The disseminated presentation of AIDS-associated KS has a poor prognosis. Pulmonary involvement generally occurs in severely immunosuppressed patients and it is associated with worse prognosis and increased mortality compared with other systems.

Conclusions: The late presentation and detection of HIV infection and delaying the initiation of ART leads to the advancement of immunodepression, with the association of AIDS indicator diseases, such as KS, with the progression to death.

LATE RESULTS OF CORNEAL TRANSPLANTATION IN CASES OF INFECTIOUS KERATITIS

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Objectives. Analyse the results of full-thickness corneal grafts, that were performed after infectious keratitis in P. Stradins Clinical University Hospital from 2016 to 2023.

Materials and Methods. Retrospective case series analysis and interpretation of case medical histories from 2016 to 2023.

Results. During this period 193 full-thickness corneal grafts were performed. In 86 cases the main cause was infectious keratitis. The most common cause of infections were bacteria (*Streptococcus Epidermidis* – 18 (20.9%), *Pseudomonas Aeruginosa* – 17 (19.7%)) and single-cell organisms (*Acanthamoeba* spp – 15 (17.4%)) followed by fungal infections (*Candida Albicans* – 14 (16.2%), *Aspergillus* spp – 6 (6.9%), others – 16).

Mean visual acuity in decimal system before surgery was 0.01 ± 0.02 , and after surgery 0.1 ± 0.04 . A secondary glaucoma developed in 23 patients, that were treated surgically (in 15 patients sinusotrabeculectomy (STE) were performed and in 8 cases – a glaucoma implant were used). The mean intraocular pressure after STE was 16 ± 3 mmHg, after the glaucoma implant surgery 10 ± 2 mmHg.

Conclusions. The full-thickness corneal graft is the last resort treatment for patients suffering from corneal lesions due to infectious keratitis. The glaucoma implant is the best treatment option for secondary glaucoma after penetrating keratoplasty in cases of infectious keratitis.

LATENCY AND REACTIVATION OF WITH AUTOIMMUNITY ASSOCIATED HUMAN HERPESVIRUSES IN COVID-19 PATIENTS

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Objectives. Human herpesviruses (HHVs) share ability of persistence in human body in latent state after primary infection which can switch to reactivation of the virus due to factors including other infections and altered state of host immune system. Furthermore, infection of several HHVs have been associated with contribution of autoimmune diseases.

The aim was to determine the presence and reactivation of with autoimmunity associated viruses – HHV-6A/B, HHV-7 and Epstein-Barr virus (EBV) in COVID-19 patients.

Materials and Methods. This study included 86 hospitalized COVID-19 patients (45 females, 41 male) from May to November 2020. Patients' age ranged from 18 to 93 years and the average age \pm SD was 61 ± 17.2 years. None of the patients included in this study had received COVID-19 vaccine. Presence of HHV-6A/B, HHV-7 and EBV was determined by multiplex real-time PCR and nested PCRs in DNA extracted from peripheral blood and cell-free blood plasma. For 48/86 patients, repeated samples in dynamics were available at two or three timepoints.

Results. Of the 86 patients included in the study, 37.2% of blood but none of the plasma DNA samples were positive for the presence of the EBV genomic sequence; 1 blood DNA was positive for HHV-6A/B, but HHV-7 was present in 20.9% DNA samples extracted from blood and in one plasma sample. In dynamics, EBV was detected in 15/48 (31.25%) blood samples. Two out of 48 (4.2%) plasma samples were HHV-6A/B positive in dynamics as well as 4/48 (8.3%) blood samples. In dynamics, 3/48 (6.25%) cases of HHV-7 infection were detected in plasma samples and 8/48 (16.7%) cases in blood.

Conclusions. This study shows that reactivation of HHV-6A/B, HHV-7 and EBV latent infection can occur in patients with severe COVID-19 disease requiring hospitalization and long-term treatment. This can affect the course and recovery of COVID-19.

LONG-TERM HEALTH CONSEQUENCES 18 TO 24 MONTHS AFTER ACUTE COVID-19 AMONG HOSPITALISED PATIENTS

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Objectives. The SARS-CoV-2 virus can cause various types of long-term health sequels. The delayed effect over a long period is not clearly known. The aim of this study was to evaluate persistent symptoms 18 to 24 months after acute COVID-19 among hospitalized patients.

Materials and Methods. The study included patients hospitalized in Riga East Clinical University Hospital September–December 2020 with confirmed COVID-19. Follow-up of fifty-one patients was taken 18–24 months after acute infection. Patients were interviewed using pre-prepared questionnaires that included a post-COVID characteristic symptoms list and blood samples were taken.

Results. The mean age of patients was 55 ± 12 years (55% women). The course of the acute COVID period was 65% – nonsevere, 29% – severe and 6% – critical. In the self-assessment, 71% of patients noted the deterioration of their health. In the interviews, 82% of patients noted at least one complaint that was not observed before COVID-19. Patients noted 1–23 different symptoms: neurological or psychological – 71%, general – 59%, cardiorespiratory – 57%, digestive – 16%, dermatological – 12%, joint and muscle abnormalities – 37%, visual – 14% and hearing changes – 10%, other – 18%. The presence and number of post-COVID symptoms were not associated with patient age, gender, chronic diseases, the severity of acute COVID, or re-infection. Self-assessment was influenced by changes in weight, but the weight was not associated with the number of symptoms reported during the interview. Levels of AST, transferrin and CRO were higher in patients with post-COVID symptoms.

Conclusions. Deterioration of the health condition is noted by most patients 18–24 months after acute COVID. More than half of the patients note new neurological, psychological, general, and cardiorespiratory complaints. Symptoms are not related to age, gender, pre-COVID chronic diseases and acute COVID severity, but some laboratory indicators are related to the complaints.

MICRORNAS AS POTENTIAL BIOMARKERS IN MYALGIC ENCEPHALOMYELITIS/CHRONIC FATIGUE SYNDROME

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Objectives. Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) continues to cause significant morbidity worldwide, and many individuals with ME/CFS symptoms remain undiagnosed due to the lack of diagnostic biomarkers. Recent evidence suggests a role of Herpesviruses (e.g. Human Herpesvirus 6) as potential causative agents and their infection has been widely reported to profoundly impact the expression of microRNAs (miRNAs), short sequences of non-coding RNA whose dysregulation has been associated with a variety of diseases including ME/CFS. In addition, the recent identification of circulating miRNAs has gained interest in the search for potential biomarkers for ME/CFS diagnosis. The objective of this study was to investigate the expression of specific miRNAs in plasma samples from ME/CFS patients.

Materials and Methods. The MagMax mirVana Total RNA isolation kit, based on magnetic-bead technology (ThermoFisher Scientific) was used to extract miRNAs from plasma of 40 patients with ME/CFS and 20 healthy donors. TaqMan advanced miRNA cDNA synthesis kit (ThermoFisher Scientific) was used to prepare the cDNA template. TaqMan Advanced miRNA assays (ThermoFisher Scientific) were used for individual analysis of target miRNAs. Data analysis was performed using Applied Biosystem real-time PCR Analysis Modules on Thermo Fisher Cloud.

Results. The procedure allowed to obtain highly sensitive and specific quantitative analysis of mature miRNAs in plasma specimens. In particular, investigated miRNAs included: miR-448, miR-124, miR-551b, miR-127-3p, miR-142-5p, miR-143-3p, miR-140-5p, miR-150-5p, miR-361-5p, miR-186-5p and ath-miR-159a.

Conclusions. The results may open the way for further validation of circulating miRNAs as new potential biomarkers in ME/CFS and increase the knowledge of the complex pathways involved in the ME/CFS.

MOLECULAR DETECTION AND CHARACTERISATION OF BACTERIAL MENINGITIS PATHOGENS DURING AND POST COVID-19 PANDEMIC IN LATVIA

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Objectives. Meningitis can be caused by different pathogens, including bacteria, fungi or viruses, however the highest global burden is seen with bacterial meningitis.

The aim of the study was to analyse bacterial meningitis pathogens by PCR during and post COVID-19 pandemics in the NRL of Latvia.

Materials and Methods. 776 cerebrospinal fluid (CSF) samples were tested by real time PCR (Allplex Meningitis-B Assay, Seegen). Capsular sequence typing (*wzh* gene) of *S.pneumoniae* was performed by Sanger sequencing, capsular typing (a-f) of *H.influenzae* (gene *ompP2*, *bexA*, *cap*) and serotyping *N.meningitidis* (B,C,W135-Y) were performed by conventional PCR. The patient age ranged from newborn to 98 years, with male/female ratio 404/372.

Results. In the period 12.2019–03.2022 positive cases were 27/577 (4.7%). 8/27 (29.6%) – *S.pneumoniae* (19A serotype – 2, 09N, 06C 23B – 1, nontypable – 3). 6/27 (22.2%) – *L.monocytogenes*. 3/27 (11.1%) – group B *Streptococcus*, 3/27 (11.1%) – *E.coli* K1. 3/27 (11.1%) – *H.influenzae* (serotype B – 1; non capsulated – 1, nontypable – 1). 3/27 (11.1%) – *N.meningitidis* (serogroup B – 1, nontypable – 2). 1/27 (3.7%) – *E.coli* K1/*S.pneumoniae* with serotype 07C. The male/female ratio was 15/12, average age 43.3, that included 7 (25.9%) kids. In the post pandemic period (04.2022–11.2022) positive cases were 17/199 (8.5%). 7/17 (41.2%) – *S.pneumoniae* (serotypes 19F,06C,15F, 07C – 1 and 3 nontypable. 6/17 (11.8%) – *L.monocytogenes*. 5/17 (29.4%) – group B *Streptococcus*. 2/17 (11.8%) – *H.influenzae* (both nontypable). 1/17 (5.9%) – *N.meningitidis* serogroup B. The male/female ratio was 6/11 with average age 38.1, that included 7(41.2%) kids.

Conclusions. After COVID-19 pandemic proportion of positive CSF increased from 4.7% to 8.5%. *S.pneumoniae* was the most common pathogen in both periods, however proportion increased noticeably post pandemic, while *N.meningitidis* and *L.monocytogenes* rate decreased and *E.coli* K1 wasn't detected at all. The *H.influenzae* range was almost the same in both periods.

MOLECULAR DETECTION AND PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS PATHOGENS IN NRL OF LATVIA, 2020–2022

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Objectives. Sexually transmitted infections (STIs) can be caused by different pathogens. *Ureaplasma* and *Mycoplasma* are naturally present in the urinary and reproductive tract of humans, however they can spread and cause STIs. *Ureaplasma* is one of the most common STIs pathogen worldwide. The rapid diagnosis of the STIs pathogens and timely treatment are essential. Multiplex PCR is a sensitive method for rapid and precise diagnosis of STIs pathogens.

The aim of the study was to analyse *C.trachomatis*, *Ureaplasma*, *M.hominis* and *M.genitalium* prevalence in the NRL of Latvia 2020–2022.

Materials and Methods. Overall 3563 clinical (urogenital, rectal or oropharyngeal swabs, conjunctival discharge, prostate gland secretion, urine) samples were collected through regular screening or for confirmation of STIs and tested by real time multiplex PCR (AmpliSens*C.trachomatis*, *Ureaplasma*, *M.hominis*, *M.genitalium* Multiplex PCR kit) – 1484 in 2020, 1087 in 2021 and 992 in 2022. DNA was extracted by the NucliSens EasyMAG (BioMerieux) automated system.

Results. Positive for at least one pathogen were 1500/3563 (42.1%) of tested clinical samples. *Ureaplasma* positive were 983/1500 (65.5%) – 334/499 (66.9%) in 2020, 341/535 (63.7%) in 2021 and 308/466 (66.1%) in 2022. Combination *Ureaplasma/M.hominis* positive were 205/1500 (13.7%) – 84/499 (16.8%) in 2020, 57/535 (10.7%) in 2021 and 64/466 (13.7%) in 2022. *M.hominis* positive were 137/1500 (9.1%) – 45/499 (9.0%) in 2020, 71/535 (13.3%) in 2021 and 21/466 (4.5%) in 2022. *M.genitalium* positive were 65/1500 (4.3%) – 8/499 (1.6%) in 2020, 27/535 (5.0%) in 2021 and 30/466 (6.4%) in 2022. *C.trachomatis* positive were 110/1500 (7.3%) – 28/499 (5.6%) in 2020, 39/535 (7.3%) in 2021 and 43/466 (9.2%) in 2022.

Conclusions. *Ureaplasma* was the most frequently detected pathogen with similar prevalence in all periods. The second most distributed pathogens were combination of *Ureaplasma* and *M.hominis*. Prevalence of *M.genitalium* and *C.trachomatis* increased during analysed period, however rate of *M.hominis* decreased in 2022.

MYCOPLASMA HOMINIS AND UREAPLASMA SPP. SELECTIVE CULTURE BROTH UNINTERPRETABLE TEST RESULT ANALYSIS

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Objectives. *M.hominis* and *Ureaplasma spp.* laboratory diagnosis is mainly based on selective culture broth diagnostic tests. Uninterpretable test results are often obtained when analysing different genitourinary tract samples.

The aim of the study was to investigate and identify the cause of an uninterpretable test result in *M.hominis* and *Ureaplasma spp.* selective culture broth assays.

Materials and Methods. In October and November 2022 619 vaginal, cervical and urethral women swab samples were tested for *M.hominis* and *Ureaplasma spp.* using selective urea – arginine culture broth assay.

At the same time these samples were tested for microbiological examination. Materials were inoculated onto various selective media – Columbia CNA, Macconkey un Sabouraud's dextrose agar and the identification of grown microorganisms were made using Bruker MALDI Biotyper sirius one system.

Results. In the examination of 619 samples 226 were positive for either *M.hominis* or *Ureaplasma spp.*; 361 were negative for both microorganisms and 32 were uninterpretable.

Further microbiological examination of the testing material that gave uninterpretable results showed that 7/32 samples were positive for multiple microorganisms: 1/7 *C.albicans* and *A.ursingii*; 1/7 *C.albicans* and *S.agalactiae*; 1/7 *C.albicans* and *G.vaginalis*; 1/7 *S.agalactiae* and *E.faecalis*; 1/7 *S.agalactiae* and *K.pneumoniae*; 1/7 *S.agalactiae* and *E.coli*; 1/7 *A.baumannii* and *E.hormaechei*.

Single isolation and identification were obtained in 25/32 uninterpretable results, where 8/25 were species of yeast, 6/8 were *C.albicans*; 1/8 was *C.glabrata* and 1/8 was *M.guilliermondii*. Gram negative rods were isolated and identified in 15/25 uninterpretable results, in which 7/15 were *K.pneumoniae*, 4/15 were *E.coli* and 4/15 were *P.mirabilis*. In 2/25 cases were isolated and identified *E.faecalis* and *E.faecium*.

Conclusions. In the analysis we obtained 6.16% uninterpretable test results. The reason for uninterpretable results could be material contamination with other bacteria (especially *S.agalactiae* and *K.pneumoniae*) and fungi (*C.albicans*) that can split urea or arginine and lead to active infection or coinfection with *M.hominis* and/or *Ureaplasma spp.*

ORAL BIOFILMS AND MUCOSAL LESIONS IN SMOKELESS TOBACCO USERS

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Objectives. Smokeless tobacco products gain more and more users due to smoke free policy. Some smokeless tobacco manufacturers claim that smokeless tobacco is a healthier choice than usual cigarettes. Unfortunately, smokeless tobacco still has a big impact on addiction, more over smokeless tobacco has a lot of side effects that society does not pay a lot of interest in, for example, oral mucosal lesions that could eventually become oral cancer or that smokeless tobacco impacts oral biofilm and could create oral diseases.

Materials and Methods. A retrospective survey was made about tobacco product consumption, habits, diet etc. Oral mucosal visual inspection was followed if the respondents used tobacco products more than 2 years, were healthy individuals and aged between 18–30. Respondents were divided in 3 groups: smokeless tobacco users, cigarette users, and non-tobacco users. All the mucosal changes were photographed (Canon, EOS 80D). If necessary, soft tissue excision was made and stained with haematoxylin and eosin and examined with a microscope with a magnification of 40x, 100x, 600x. Saliva samples were obtained from respondents (1 mL) and periodontal pathogens were detected (RT-PCR, Sacace Biotechnologies). Statistical analysis was made using SPSS IBM 27.

Results. The location of the mucosal changes was where the smokeless tobacco sachets were placed. The characteristics of oral mucosa were mostly white, localized lesions, with leathery like appearance. The usage of smokeless tobacco affects oral biofilm compared to respondents who do not use smokeless tobacco.

Conclusions. The use of smokeless tobacco affects oral health. First, it causes changes in the oral mucosa leading to predominantly white, leathery-like and local lesions. Secondly, by changing the oral biofilm, it potentially causes a variety of diseases related to oral health.

PLATELET-RICH FIBRIN ANTIBACTERIAL ACTIVITY AGAINST KLEBSIELLA PNEUMONIAE

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Objectives. Wound healing in the oral and maxillofacial region is compromised by infection. The antimicrobial properties of PRF play an important role in its successful application for tissue healing and regeneration. Last decade studies on PRF antimicrobial properties have increased and gained more attention and antimicrobial activity testing prevails using oral microbiomes.

Materials and Methods. Antibacterial activity testing was done using the agar-well diffusion method. Bacterial suspension of *K. pneumoniae* was inoculated on Mueller hinton agar (MHA) (Oxoid, UK). Peripheral blood samples from 17 healthy volunteers were drawn with the butterfly blood collection method in 10 mL S-PRF tubes. Tubes were placed in a centrifuge and centrifuged at 700 rpm for 3 min according to Choukroun's protocol to obtain i-PRF. i-PRF was pipetted in prepared MHA wells and incubated at 37°C for 24 hours. Measures of zones of inhibition (ZOI) were done.

Results. Experiments using *K. pneumoniae* reference cultures revealed moderate i-PRF antibacterial activity, showing ZOI (more than 5 mm) around MHA wells using samples from 10 patients.

Conclusions. Because of PRF's inhomogeneous nature and clotting ability there is great importance in the use of the appropriate methodology to determine PRF's antimicrobial effect and to get reliable results. i-PRF demonstrated antimicrobial activity against oral flora typical pathogens, but also to *K. pneumoniae* showing the perspective to widen PRF application.

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PREDOMINANT GROUPS OF MEDICAL CONDITIONS, INCLUDING AUTOIMMUNE REACTIONS, REPRESENTED IN THE REPORTING OF SUSPECTED ADVERSE REACTIONS TO COVID-19 VACCINES IN THE EUDRAVIGILANCE DATABASE

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Objectives. Vaccination continues to play an important role in limiting the spread of infectious diseases. At the same time, vaccines represent safety risks and vigilance systems are being set up to monitor them nationally and internationally. In the COVID-19 pandemic settings, the role of vaccine safety monitoring has increased due to the massive introduction of new vaccines without sufficient experience with their use. The aim of this study was to identify the predominant groups of medical conditions reported by clinicians and patients after vaccination within the EU passive vigilance system.

Materials and Methods. The data publicly available in the EudraVigilance European Database for Suspected Adverse Drug Reaction Reports were analysed by quantitative methods. Reports submitted to the EudraVigilance database are coded using MedDRA terms for medical conditions. In addition, a scoping literature review was carried out to complement the research framework.

Results. The results demonstrated that the “general disorders and administration site conditions” group significantly exceeds other categories of medical conditions following COVID-19 vaccination. Noticeably, that “chronic fatigue syndrome” also belongs to this group according to MedDRA. Two other dominant reaction groups for COVID-19 vaccination are “nervous system disorders” and “musculoskeletal and connective tissue disorders”, which also have a vast range of medical conditions. A scoping literature review identified a number of publications on specific neurological and autoimmune manifestations after vaccination. New-onset autoimmune phenomena after COVID-19 vaccination have been reported increasingly (e.g., immune thrombotic thrombocytopenia, autoimmune liver diseases, Guillain-Barré syndrome, IgA nephropathy, rheumatoid arthritis, and systemic lupus erythematosus).

Conclusions. Data from the passive vaccine vigilance system allow the identification of predominant groups of reported medical conditions. However, obtaining operational information would require an active system. Therefore, future research should focus on active pharmacovigilance models, as well as more in-depth research on vaccine-induced complications to reduce risks in the future.

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PREVALENCE OF ALLERGIC DISEASES IN PATIENTS WITH CHRONIC SPONTANEOUS URTICARIA IN LATVIA

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Objectives. Chronic spontaneous urticaria (CSU) is an autoimmune disease and it can be associated with other comorbidities, including a variety of allergic diseases. It is often misunderstood that CSU is caused by allergens and in many cases unreasonable dietary restrictions are recommended, which, besides the symptoms of the disease, has a significant impact on patients' quality of life.

The intent of the current study was to verify the prevalence of allergic diseases among CSU patients in Latvia and to evaluate the types of allergies and most frequent allergens.

Materials and Methods. Retrospective review, based on patient interviews and electronic medical records from DataMed information system. SPSS statistical software was used for analysis of the received data.

Results. Medical data from 58 patients with CSU were analyzed. 45 patients (77.6%) were women and 13 (22.4%) men. The mean age of patients was 41.02 ± 16.07 (15–73) years. Among the patients, 32 (55.2%) were allergic and 26 (44.8%) were not. As clinical manifestations 12 (20.7%) patients had allergic rhinitis, 8 (13.8%) contact dermatitis, 8 (13.8%) food allergy, 7 (12.1%) drug hypersensitivity, 2 (3.4%) oral allergy syndrome, 2 (3.4%) bee venom allergy, 1 (1.7%) asthma, 1 (1.7%) photosensitivity, 6 (10.3%) patients had multiple allergy types. The most frequent allergens were house dust mites 8 (13.79%), cat 6 (10.34%), grass pollen 5 (8.62%), mugwort pollen 5 (8.62%), spring tree pollen 4 (6.89%), dog 4 (6.89%). Among allergic individuals, 15 (46.88%) were monosensitized and 17 (53.12%) were polysensitized to multiple allergens.

Conclusions. Chronic spontaneous urticaria is more common among women than men. The mean age of patients was 41.02 years. Of all CSU patients, 55.2% had allergies. The most common clinical manifestations of allergy were rhinitis, contact dermatitis, drug hypersensitivity and food allergy. The most frequent allergens were house dust mites, cat, grass pollen, mugwort pollen, spring tree pollen and dog.

PREVALENCE OF DENTAL MICROFLORA ON THE ADENOID SURFACE IN CHILDREN WITH ADENOID HYPERPLASIA

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Objectives. To identify dental and gingival bacterial microflora on genus level on the surface of adenoid tissue extracted from children undergoing adenoid operations in order to detect the level of dissimulation of odontogenic microflora among other bacterial microorganisms.

Materials and Methods. Microbiological swabs of adenoid surface tissue extracted during elective adenotomy surgical procedure on pediatric patients (three to seven six old) who suffer from adenoid enlargement associated diseases. Microbial DNA was extracted using FastDNA, the V3-V4 hypervariable region of the bacterial 16S rRNA gene was amplified. Data was imported into QIIME2, where we performed trimming of primer sequences to select reads matching the V3 and V4 hypervariable regions. The amplicon sequencing data are available in the European Nucleotide Archive.

Results. Twenty-one sample was analyzed (11 male and 10 female, 2 to 6 years old). Taxonomic analysis on phylum and genus level was conducted. Genus level analysis identified dental and buccal bacteria *Veillonella atypica* and *Fusobacterium nucleatum* on the adenoid surface in relative abundance, *Veillonella* genetic material attributing to 13% and *Fusobacterium* to 18% of total genetic material identified. Genetic material of *Shaalaa odontolytica*, another common dental pathogen, was also represented in our samples, attributing to 7% of total genetic material. Phylum level analysis identified Firmicutes as the dominant phylum of bacterial microorganisms, followed by bacteroides.

Conclusions. Dental bacterial microflora is abundantly represented on adenoid surfaces of children suffering from adenoid hyperplasia. Genetic material of dental and gingival microflora (*Veillonella atypica* and *Fusobacterium nucleatum*) attributed to 38% of total bacterial genetic material in our samples. Our findings suggest a more prominent migration of odontogenic microflora deeper into the nasopharynx and the adenoid surface.

PREVALENCE OF PARASITIC INFECTIONS WITH ZOONOTIC POTENTIAL IN SHREWS, RODENTS AND FROGS IN LATVIA

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Objectives. Human infection with parasites is a health problem of a current interest, as they can contact with infected domestic and wild animals, which were involved in the life cycles of parasites as definitive or intermediate hosts. In shrews, rodents and frogs, parasite species were registered, which are potentially parasitic or pathogenic in humans (i.e. those with high zoonotic potential). Aim of this study was to investigate helminths these animals take in focus on parasitic zoonotic agents.

Materials and Methods. The investigation was carried in Daugavpils University Institute of Life Sciences and Technology, Department of the Ecology, Laboratory of the Parasitology and Histology from 2015 till 2022. Full parasitological examination of 1295 animals on helminths presence was done.

Results. Zoonotic agents were found in investigated animals. Humans are more often infected with *Hymenolepis diminuta* (Rudolphi, 1819, *Echinoparyphium recurvatum* (von Linstow, 1873), Lühe, 1909. Less commonly, infection occurs with *Mesocostoides lineatus* (Goeze, 1782) and *Calodium hepaticum* (Bancroft, 1893). Trematoda *Alaria alata* (Goeze, 1782), Krause, 1914 is still a debatable species among scientists, as to whether or not it is pathogenic to humans

Conclusions. The findings of this study indicate pathogenic for human parasites in shrews, rodents and frogs. Adult stages of *H. diminuta* was found in rodents, frogs were involved in the *E. recurvatum* metacercaria transmission. *Mesocostoides lineatus* larvae was detected in one shrew, and in rodents as well. *Calodium hepaticum* larvae observed in rodents, in turn *A. alata* mesocercaria in frogs.

PREVALENCE OF TICK-BORNE PATHOGENS IN IXODES RICINUS TICKS COLLECTED FROM AUTUMN MIGRATORY BIRDS IN LATVIA

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Objectives. Birds play an important role for dissemination of tick-borne pathogens to both nearby and remote localities, and also can act as reservoir hosts. In this study, tick infestation of birds in Latvia was examined and prevalence of tick-borne pathogens in bird ticks was studied.

Materials and Methods. Ticks were collected from resident and migratory birds captured at the Pape Ornithology Station, Latvia, during the autumn migration season in 2018. Ticks were molecularly identified to species, and morphologically to developmental stage, and the presence of tick-borne pathogens was determined by molecular methods.

Results. In total, 1220 nymphs and larvae were collected from 369 birds. Tick-infested birds belonged to 38 different species, of which European robin (*Erithacus rubecula*), blackbird (*Turdus merula*), song thrush (*Turdus philomelos*) and dunnock (*Prunella modularis*) were most strongly infested. Mean tick infestation per bird was 3.3; in some single cases up to 33 ticks per bird were found. Ticks were examined for several pathogens; nymph samples were processed individually, while all larvae samples from a single bird were combined in pools. *Borrelia* sp. was detected in 7.9%, and *Candidatus N. micurensis* bacteria were detected in 3.9% of the ticks. In addition, a low number (< 1.0%) of tick samples were positive for *A. phagocytophilum*, *Babesia* and *Rickettsia* pathogens. Coinfection cases were detected in several nymph and larvae samples. Larvae of *I. ricinus* with *B. miyamotoi*, *B. garinii*, *B. spielmanii* and *B. afzelii* were removed from five bird species, particularly *T. merula* and *E. rubecula*, which may suggest that the larvae had contracted the *Borrelia* bacteria from or via these birds.

Conclusions. The results of this study highlights the substantial contributions of birds to the maintenance and dispersal of several tick-borne pathogens.

RELATIONSHIP BETWEEN LOW-DENSITY LIPOPROTEIN CHOLESTEROL AND SEVERITY AND OUTCOME OF THE COVID-19 DISEASE

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Objectives. From 2020 the world is living under the conditions of COVID-19 pandemic. Currently, more than 600 million cases of COVID-19 infection have been registered in the world, according to WHO data from December 2022, more than 6.5 million people died. But despite the global pandemic, people have co-morbidities, such as coronary heart disease, which is still one of the most common causes of death in Latvia. Low-density lipoprotein cholesterol is known to be one of the risk factors for coronary heart disease, but how this affects the course, severity, and outcome of COVID-19 is unknown. Currently, there is not enough data on the topic of this work in Latvia.

The main purpose of this retrospective study was to find relationship between low-density lipoprotein cholesterol and the severity and outcome of COVID-19 disease

Materials and Methods. This retrospective study was conducted at the Pauls Stradins Clinical University Hospital, Riga East University Hospital and involved adults > 18 years old who were hospitalized during the period from 01 October 2021 to 31 March 2022 with laboratory-confirmed COVID-19 infection and laboratory-determined low-density lipoprotein cholesterol. Clinical data and results were collected from medical records using MS Office Excel and analysed using SPSS program.

Results. A total of 189 patients were included, 64.4% were women and 35.6% were men. 173 patients survived and 16 died. There was no statistically significant difference in distribution of low-density lipoprotein cholesterol between surviving and deceased patient groups (Mann-Whitney U test, $p = 0.438$). There was no found statistically significant correlation (Spearman's rank correlation, $p = 0.700$) between low-density lipoprotein cholesterol and the severity of COVID-19 disease.

Conclusions. The results of the study show that low-density lipoprotein cholesterol levels were not associated with disease severity and outcome of COVID-19. Further prospective research should be done in this area.

RESISTANT SYSTEMIC SCLEROSIS WITH MULTIORGAN DAMAGE

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Objectives. Systemic sclerosis (SSc) is rare autoimmune disease through the lifetime and affects multiple organ systems, including the skin, gastrointestinal tract, lungs, kidneys, and heart. The most common pulmonary manifestations of SSc, interstitial lung disease (ILD) and pulmonary arterial hypertension (PAH), are the leading causes of death and account for up to 60% of the SSc-associated mortality. The patient, a 65-year-old woman, was diagnosed with SSc with ILD in 2011. Initially, therapy was applied with medrol, later in combination with azathioprine. Due to ineffectiveness, the therapy was changed to methotrexate. As shortness of breath progressed, therapy was adjusted to cyclophosphamide orally, but leukopenia and anemia developed. Therapy changed to cyclophosphamide intravenously. Due to progressive shortness of breath and cough, digestive tract damage therapy was adjusted to mycophenolate mofetil in 2017. In dynamics, the course of ILD worsens with constant dry cough, shortness of breath and low exercise tolerance. From the middle of 2021, Rituximab has been started. In dynamics, complaints of cough, shortness of breath, arrhythmia, Raynaud's syndrome intensify, as well as low exercise tolerance and active alveolitis in bronchoalveolar lavage was detected. Mycophenolate mofetil and continuous oxygen was added to the therapy. After less than a month, numbness developed around the mouth, tongue and throat. Mycophenolate mofetil was discontinued. The tingling went away. For diagnostic purposes, an MRI of the head was performed, where vascular foci in the brain, pontine myelinosis were detected. In 2022, cardiac probing was performed and PAH was detected. Therapy with tadalafil was started. There was a slight decrease in shortness of breath during the first month, but then it got worse again. Computer tomography of lungs and lung functional tests showed negative dynamics of ILD, therefore nintedanib is added to the therapy. This clinical case shows ILD progression despite aggressive immunosuppressive treatment.

ROLE OF ANTI-NUCLEAR AND ANTI-GANGLIOSIDE ANTIBODIES IN PATHOGENESIS OF POLYNEUROPATHY IN SYSTEMIC SCLEROSIS

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Objectives. Systemic sclerosis (SSc) is an autoimmune connective tissue disease. Polyneuropathy (PNP) is considered a rare SSc complication but can significantly affect patients' quality of life. The current study aimed to assess different antinuclear antibodies (ANA) patterns and anti-ganglioside antibodies (AGA), and their role in PNP pathogenesis.

Materials and Methods. The study included 2 groups: SSc patients with PNP (24) and without (24), with matching gender and age ratio. The indirect immunofluorescence test was performed to assess the presence and pattern of ANA, and ELISA was used for AGA detection.

Results. In both groups, there were 18 females and 6 males, mean age in females was similar: 69.5 with PNP, 67 without PNP, but males without PNP were much younger than those with: 70.5 with PNP, 46.33 without.

ANA were detected more in patients with PNP (21/24 vs 15/24, $p = 0.0933$), but the distribution of patterns of ANA were quite similar in both groups: most common was centromere (9/24 vs 8/24), next was speckled (9/24 vs 7/24), but homogeneous and nucleolar patterns were seen only in PNP group: 2/24 and 1/24 respectively. patients with PNP were tested for the presence of AGA, and 3 (12.5%) had positive AGA, compared to data from other AGA studies, where positive antibodies were found in 15.5% of healthy individuals.

There was no association between the presence of ANA ($p = 0.0933$) or ANA different patterns ($p = 1.000$) and AGA.

Conclusions. ANA and different patterns were not found to be relevant in the pathogenesis of PNP in SSc AGA can be found positive in patients with SSc-associated PNP, for their significance in SSc a larger sample size should be tested.

ROLE OF MATRIX METALLOPROTEINASE 8 IN THE ACUTE COVID-19

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Objectives. Matrix metalloproteinase 8 (MMP-8) is a collagenase dominantly produced by neutrophils. It belongs to the family of MMPs, which regulate the degradation of extracellular matrix (ECM) and affect different phases of the immune response. Previous studies on MMP-8 in respiratory diseases showed that increased activity of MMP-8 facilitates inflammation and lung tissue destruction. Our study aimed to assess the role of MMP-8 in acute COVID-19, accounting for its relationships with hyaluronic acid (HA) as the main product of ECM and other parameters related to the disease severity.

Materials and Methods. The cross-sectional study included 101 patients with COVID-19 hospitalized from September to December 2020. Blood-based clinical tests were performed at admission to the hospital. The levels of MMP-8 and HA were detected in serum by ELISA. The severity of COVID-19 was retrospectively assessed following the World Health Organization definition. Spearman's correlation, network analysis, and mediation analysis were conducted.

Results. The mean age of patients was 60.4 ± 14.3 years (50% were women). Forty patients had severe and critical disease courses. The level of MMP-8 at admission (median was 1689 pg/mL, IQR [1004; 2273]) had no difference between patients with different disease severity. Spearman's correlations showed an association of MMP-8 with leucocytes, neutrophils, C-reactive protein, minimal blood oxygen saturation, and serum enzymes such as gamma-glutamyl transferase (GGT) and aminotransferases (ALT and AST). The network analysis emphasized two direct relationships of MMP-8. It was positively related to the absolute count of neutrophils and GGT. The following analysis pointed to MMP-8 as a partial mediator in the relationship between neutrophils and GGT.

Conclusions. In the acute phase of COVID-19, MMP-8 was involved in inflammation and could mediate multiple organ damage.

ROLE OF MICROBIOME IN PATHOGENESIS OF IMMUNOGLOBULIN A NEPHROPATHY

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Objectives. Recent years studies indicate the importance of gut-kidney axis in the pathogenesis of immunoglobulin A nephropathy (IgAN). Progression of IgAN has been associated with gut dysbiosis and bacterial translocation. The gut microbiome is dynamic and varies in different populations, ages, sexes, seasonal variations, geographies, ethnicities, diets, and lifestyles.

Materials and Methods. Project “Dissecting the interplay between intestinal dysbiosis and B cell function in the pathogenesis of immunoglobulin A Nephropathy” No. lzp-2019/1-0139 funded by the Latvian Council of Science, has started the implementation in Pauls Stradiņš Clinical University Hospital in January 2020. Adults with a morphologically confirmed IgAN and healthy individuals were included in the study. Gut microbiota of fecal samples of IgAN patients and healthy controls were analyzed using 16S rDNA sequencing.

Results. Our projects results will follow this year. According to other studies, the genera, *Streptococcus* and *Paraprevotella* showed a higher proportion in patients with IgAN compared to healthy individuals, whereas *Fusicatenibacter* showed a lower abundance according to meta-analysis. Qualitative analyses suggested that *Escherichia-Shigella* might be increased in IgAN patients.

Two multicenter placebo-controlled trials (the phase 2b NEFIGAN and the phase 3 NefIgArd studies) showed clinically important improvements in proteinuria and glomerular filtration rates in IgAN patients who were treated with targeted-release budesonide.

Conclusions. Gut microbiome represents a novel therapeutic target for improving the outcome of IgAN.

SEROPREVALENCE OF SARS-COV-2 ANTIBODIES AMONG CHILDREN IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL, RIGA, LATVIA

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Objectives. Over the past two years Coronavirus disease 2019 (COVID-19) has become one of the key global health concerns affecting numerous countries including Latvia. The aim of this study was to detect seroprevalence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) antibodies in children and adolescents to ascertain the overall morbidity in Latvia and compare these findings with similar data collected globally.

Materials and Methods. A cross-sectional seroprevalence study was conducted from March to July 2022 enrolling 200 participants aged 0 to 18 years. Participants were selected randomly from patients hospitalised at Children's Clinical University Hospital of Riga, Latvia for reasons other than COVID-19. Spike protein and nucleocapsid antibodies against SARS-CoV-2 were detected in blood samples. The presence of SARS-CoV-2 nucleocapsid antibodies was set as a main criterion for seropositivity. Study sample was divided into three age groups and further analysed.

Results. 173 out of total 200 study participants turned out to be seropositive, leading to overall seroprevalence of 86.5%. The highest seroprevalence was observed among children and adolescents aged 12 to 18 years (94.3%) whereas the lowest – in children under 5 years of age (77.8%). 123 (61.5%) participants mentioned having had confirmed COVID-19 at least once in the period of previous two years. The seroprevalence data collected shows that 50 of the 173 (28.9%) seropositive children were not aware of being infected with SARS-CoV-2 due to asymptomatic or mild course of the disease.

Conclusions. Prior to this study there was no data available in Latvia on seroprevalence of SARS-CoV-2 among children. The study showed high seropositivity in this population group. Studies collected globally revealed similar findings with significant increase of seroprevalence among children since the beginning of the pandemic. Increasing morbidity most likely indicate that COVID-19 might become a seasonal illness.

SIGNIFICANCE OF CLINICAL PRESENTATIONS IN THE COURSE OF THE IMMUNOGLOBULIN A NEPHROPATHY (IGAN)

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Objectives. IgAN is believed to be the most common type of glomerulonephritis worldwide. However, there are considerable variations in the prevalence, clinic presentation, and prognosis of IgAN in different geographic areas. Similarly to Western Europe, in Latvia, IgAN has a moderate prevalence in 2013 (23%) among all kidney biopsies (KB) in Pauls Stradins Clinical University Hospital Nephrology Centre. An analysis of the clinical manifestations of IgAN is one of the important strategies in the course of the disease. This would allow a better understanding of the pathogenesis and treatment of IgAN, and prevent premature kidney death.

Materials and Methods. This research is funded by the Latvian Council of Science (No. Izp-2019/1-0139). From January 2020 to March 2021 adult patients with morphologically proven primary IgAN were enrolled in the study. We studied a main clinical presentation of IgAN (hematuria; proteinuria; arterial hypertension, course of chronic kidney disease (CKD). KBs were analysed according to Oxford classification (MEST-C). We evaluated leucine-rich alpha-2-glycoprotein (LRG1) in serum and urine as a marker of kidney damage.

Results. A total of 80 patients with IgAN were included, 65% men. The median age was 40 years (21–65). The patient subset according to the stage of CKD was 21%, 19%, 14%, 16%, in stages 1,2,3,4 respectively, with dialysis – 11% and kidney transplant –19%. The MEST-C score was M0–22.5%, M1–77.5%; E0–92.2%, E1–7.8%; S0–27.5%, S1–72.5%;

T0–73.5%, T1–13.8%, T2–12.5%; C0–88.8%, C1–7.5%, C2–3.8%. More than 50% of the subjects had hypertension, proteinuria, obesity, and eGFR < 60 mL/min or dialysis. Shrunken pore syndrome (SPS) as a kidney disorder associated with premature death (eGFRcystatin C/eGFRcreatinine < 0.7) was found in 18% of patients. The increase in serum LRG1 was correlated with the decline in GFR and mesangial hypercellularity.

Conclusions. IgAN is diagnosed with clinical signs of advanced CKD and a possible risk of premature death due to cardiovascular disorders.

SUSCEPTIBILITY PROFILE OF STREPTOCOCCUS AGALACTIAE ISOLATED FROM PATIENTS WITH URINARY TRACT INFECTION

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Objectives. The aim of the study was to examine urine samples from patients with a clinical picture of urinary tract infection and to identify the uropathogen in these samples – Group B streptococcus – *Streptococcus agalactiae*. On the next step antimicrobial susceptibility testing of *S.agalactiae* was undertaken.

Materials and Methods. From 1st January to 15th December 2022 16 161 urine samples were microbiologically tested for uropathogens. Urine samples were inoculated onto different microbiological media – Columbia agar and Uriselect agar, and the identification of grown microorganisms were made using Bruker MALDI Biotyper sirius one system.

The antimicrobial susceptibility testing was done using the Kirby–Bauer methods according to EUCAST guidelines 2022.

Results. In the examination of 16161 urine samples 382 were positive for *S.agalactiae*. From 382 samples 372 were taken from women and 10 were taken from men.

Antimicrobial susceptibility testing results of *S.agalactiae* showed that 287/382 isolates were susceptible to erythromycin, 89/382 were resistant and 6/382 were susceptible in increased exposure; 307/382 isolates were susceptible to clindamycin, 75/382 were resistant; 372/382 isolates were susceptible to benzylpenicillin, 10/382 were resistant; 375/382 isolates were susceptible to nitrofurantoin, 7/382 were resistant; 66/382 isolates were sensitive to tetracycline, 306/382 were resistant and 10/382 were susceptible in increased exposure; 353/382 were susceptible in increased exposure to levofloxacin and 29/382 were resistant; 174/382 isolates were susceptible to trimethoprim/sulfamethoxazol, 206/382 were resistant and 3/382 were susceptible in increased exposure.

Conclusions. Most *S. agalactiae* isolated from urine samples are sensitive to the main antimicrobial agent used in infection therapy – benzylpenicillin. High resistance to tetracycline and trimethoprim/sulfamethoxazole was observed in the study.

TOWARDS DIGITAL ONTOLOGY OF ME/CFS IN SELF-MANAGEMENT AND ASSISTANCE APPLICATIONS

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Objectives. Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) is a chronic debilitating medical condition of unknown aetiology. While clinical diagnostics is increasingly entering common medical practice, especially post-COVID, absence of validated biomedical framework not only complicates disease progression and prediction, but also makes access to modern digital healthcare tools complex. Fuzzy ontology of ME/CFS keeps it at distance from integration into major global efforts in digital healthcare. While novel approaches to digital health solutions and apps is emerging, traditional, widely reimbursed toolkits are based on very mechanistic “computer = machine” methodologies.

Materials and Methods. Ontology databases analysed: University of Maryland School of Medicine Disease Ontology Project (<https://disease-ontology.org/>), EMBL-EBI OLS Ontology database (<https://www.ebi.ac.uk/ols/>), National Cancer Institute Thesaurus (<https://ncit.nci.nih.gov/>), National Library of Medicine MESH database (<https://meshb.nlm.nih.gov/>), Alliance of Genome Resources Database (<https://www.alliancegenome.org/>), SNOMED CT Browser (<https://browser.ihtsdo.org/>), ICD-9, 10, 11, literature analysis on ME/CFS classification cases and ME/CFS – related syndromes as PAIS, PAPIS.

Results. ME/CFS ontology is dominated by very poor classification tree under “syndromes”, where we can count also ICD10:R53.82. Specific classifications are under diseases of nervous system as ICD10:G93.3 and MESH classification tree for musculoskeletal diseases. Case evidence as Royal Free epidemic outbreak analysis demonstrate that availability of proper toolkit (mathematical modelling of infectious disease) can deliver a great contribution to proper classification.

Conclusions. Participation in digital healthcare and reimbursement of very much needed digital devices, apps, etc. depends on ability to press the disease ontology into proper digital profile. Digitalisation of lab tests, imaging, and disability accession platforms increases the patient dependence of fitting the proper shortened clinical pathway initially and at regular intervals. ME/CFS ontology as a post-viral syndrome has an advantage as not putting a straightjacket on individual natural course, but can have disadvantages of not delivering (symptomatic) treatments located on diverging ontological trees.

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TRENDS IN MICROBIOLOGICAL SPECTRUM AND ANTIBIOTIC RESISTANCE PATTERN IN PERIPROSTHETIC JOINT INFECTIONS

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Objectives. Periprosthetic joint infections is one of the most devastating complication after total joint arthroplasty (PJI). We sought to characterise the causative pathogens of PJI, and to evaluate trends in the microbial aetiology.

Materials and Methods. Over a ten-year period, hip and knee PJI patients treated at the Hospital of Traumatology and orthopaedics (Latvia, Riga), were retrospectively included. We divided this period into two 5-year intervals (2013–2017 and 2018–2022). The demographic characteristics, causative pathogens and antimicrobial susceptibility, time of infection, site of arthroplasty were recorded.

Results. A total of 449 first-time infection cases (263 hip PJIs and 186 knee PJIs) from January 2013 to December 2022 were included in the retrospective study. A microbiological diagnosis was obtained for 400 cases (89%). In all, 6.2% of all episodes (28) were polymicrobial.

The main pathogens were gram-positive cocci, accounting for 65% of the isolates, and the most common pathogen was *S.aureus*, accounting 31.8% (n = 143) of the isolates, followed by coagulase-negative staphylococci (n = 89; 19.8%). The distribution of these microorganisms slightly differ between the two study periods (*S. aureus*: 27.9% in 2013–2017, 34.2% in 2018–2022; coagulase-negative staphylococci 22.7% in 2013–2017, 18.6% in 2018–2022). Gram-negative bacilli accounted for 10.6% of the isolates (8.7% in 2013–2017, 12% in 2018–2022), fungi accounted only for 0.6% (n = 3).

Multidrug resistant bacteria were involved in 25 (5.5%) PJIs during the study period, including 4 methicillin resistant *staphylococcus aureus*, 20 multidrug resistant Gram negative bacilli and 1 vancomycin resistant enterococcus. The proportion of PJI caused by multidrug-resistant bacteria increased from 2.8 (n = 6) in 2013–2017 till 6.2% (n = 15) in 2018–2022.

Conclusions. The distribution of microorganisms was not significantly different between the two periods. The exception is the increase in the proportion of multiresistant microorganisms, mainly due to the increase in resistant Gram negative microorganisms. The observed trends have significant implications for prescribing empiric therapy for acute PJIs.

UNILATERAL VESTIBULOPATHY AFTER COVID-19: CASE REPORT

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Objectives. Despite public health measures and vaccination, millions of people continue to become infected with SARS-CoV-2. 35% of COVID-19 patients have neurological symptoms (Mao et al, 2020), which can subside after the acute phase, or continue as the post-COVID syndrome up to 6 or more months in 57% of COVID survivors (Taquet et al, 2021). The vestibular neuritis can be explained by COVID-associated microvascular lesions (Smadja et al, 2021), and the presence of ACE receptors, necessary for tissue invasion by SARS-CoV-2, in the inner ear (Jeong et al, 2021).

The case report presents a patient, a 35-year-old woman, fully vaccinated against COVID-19 in June 2021. She contracted COVID-19 and developed pneumonia in October 2021. Initial outpatient treatment included amoxicillin / clavulanate, NSAIDs nasal decongestants, and inhaled fluticasone. After 10 days she developed an intermittent vertigo and nausea worsening with head turning movements. The patient had no prior history of vertigo and denied experiencing tinnitus or hearing loss. A slight horizontal nystagmus to the left was present. Inflammatory markers and coagulation parameters were within normal range. Carotid and vertebral artery duplex ultrasound showed normal findings. Vertigo remained intermittent for 38 weeks, causing short-lasting symptoms 4–8 days per month; the patient took no medication. In August 2022 she was hospitalized due to persistent vertigo for 2 days. CT scan of the head without contrast showed no acute pathology. An EEG and brain MRI with angiography showed no pathological findings. The patient has been on permanent sick leave and consulted by a neurologist monthly since August 2022 until January 2023. Starting August 2022, she's been managed symptomatically with betahistine, meldonium and vitamin D supplementation. Her symptoms have been gradually improving, and she reported no vertigo since December 2022, making the complete duration of vertigo for 13 months after COVID-19 infection.

VARIATIONS OF SODIUM AND POTASSIUM IONS IN SEVERE FORMS OF COVID-19

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Objectives. Neurohormonal disorders and organ dysfunction in severe forms of COVID-19 can generate electrolyte changes, therefore, the assessment of Na⁺ and K⁺ ion disturbances in patients with severe forms of COVID-19 is important.

Materials and Methods. It is a retrospective study on 30 patients – 10 men and 20 women with severe forms of COVID-19 (positive PCR test) treated in the ICU in 2021. Were excluded from the study: people aged < 18 years; patients with autoimmune diseases, chronic liver, kidney and heart diseases who permanently administer drugs inducing electrolyte disturbances. We examined the values of Na⁺ and K⁺ ions at admission, after 24h and 48h in the ICU.

Results. Average age of patients – 51 ± 5 years. Men – mean age 59 ± 3 years. Women – average age 44 ± 3 years (fertile age), 10 of them – girls with an average age of 31 ± 2 years. At admission, 12 patients (40%) had hypokalemia. After 24 hours of treatment, hypokalemia persists in 8 patients (26%) and does not improve even after 48 hours in 6 patients (20%). At admission, hyponatremia is determined in all patients, among them – mild and moderate hyponatremia was assessed in 24 patients (80%), and in 6 people (20%) – severe deficiency, requiring corrective treatment. After 24 hours of treatment, hyponatremia persists in 76.67% of patients, 2 patients (6.67%) remaining severe. The increase in sodium level is significantly ($p \leq 0.01$) higher in women than in men, ($p \leq 0.00001$) (estrogens, modulate ion transport, inhibit the cotransport of Na⁺ through cell membranes, show competitive action with aldosterone for mineralocorticoid receptors, promotes sodium and water retention, maintains edema). After 48 hours, in 96.66% of patients the values of Na⁺ ions normalize, and in one case (3.33%) – Hypernatremia is appreciated.

Conclusions. Patients with severe complications of SARS CoV-2 infection present severe Na⁺ and K⁺ deficiencies.

SCHNITZLER SYNDROME – A RARE CAUSE OF CHRONIC URTICARIA

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Introduction. Chronic spontaneous urticaria (CSU) manifests in the spontaneous appearance of wheals for more than 6 weeks due to known or unknown causes, which may be accompanied by angioedema. The disease occurs with daily signs and symptoms or as a recurrent course, even after years of full remission. Schnitzler syndrome, which is chronic urticaria with monoclonal gammopathy should be taken into consideration in differential diagnosis. 150 cases of this medical condition have been described, mainly in Europe. Treatment consists of appropriate steroid therapy and immunosuppression. The prognosis is variable and depends on the severity of the organ disease.

Keywords. Schnitzler syndrome; Chronic urticaria; Allergology; Immunology; Autoimmunology

Case Description. A 64-year-old man was admitted to the department urgently with worsening symptoms of chronic urticaria for more than a year. He had previously been treated with quadruple-dose of antihistamines, montelukast, and inserts of systemic steroid therapy. Each reduction in steroid therapy was associated with a recurrence of complaints, impairing daily functioning. Laboratory tests revealed: leukocytosis with neutrophilia, CRP 15 mg/L, IL-6 30 pg/ mL, IgM 3.08 g/L, and a suggestion of monoclonal protein in the proteinogram, confirmed by immunofixation. The diagnosis was extended with a skin biopsy –neutrophilic urticarial vasculitis was found. The patient was referred urgently to the clinical immunology clinic for verification and qualification for biological treatment.

Summary. The case report presents Schnitzler syndrome, which without additional diagnostics could be mistaken for chronic spontaneous urticaria. Schnitzler syndrome should be suspected in patients with recurrent urticarial rash and any of the following symptoms: fever; fatigue, general malaise; pain in joints, muscle and/or bone, enlarged lymph nodes, liver or spleen; leukocytosis and/or increased markers of inflammation; monoclonal gammopathy; neutrophilic infiltrate on skin biopsy.

Conclusions. Each case of chronic urticaria, especially poorly responsive to standard treatment, requires a thorough differential diagnosis so that rare conditions are not overlooked. Their identification provides an opportunity to implement effective therapeutic management.

A CASE REPORT OF ASPERGILLOSIS IN LIVER TRANSPLANT RECIPIENT

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Keywords. Aspergillosis; Hepatic; Liver transplant

Introduction. Invasive aspergillosis (IA) is a significant cause of morbidity in immunocompromised patients. Its incidence in liver transplant recipients ranges from 1% to 9%, while the mortality rate exceeds 80%. Liver involvement in IA is uncommon. We present a rare case of successfully treated hepatic IA in a liver transplant recipient and its diagnostic challenges.

Case Description. A 54-year-old male was admitted to the hospital with complaints of fatigue, poor appetite, and intermittent pain in the right side of the abdomen. 10 months prior the patient underwent successful liver transplantation due to decompensated cryptogenic liver cirrhosis with Child-Pugh 10, MELD-Na scores 28. Current immunosuppressive treatment consisted of tacrolimus and mycophenolate mofetil. Initial laboratory testing revealed increased cholestatic and uremic markers. Abdominal ultrasound detected ascites. Contrast CT was performed to rule out a. hepatic thrombosis, showing no signs of hepatic blood flow impairment. Diagnostic paracentesis revealed low serum ascitic albumin gradient with lymphocytosis. Tuberculosis was considered but later excluded. To rule out fungal infections, serum galactomannan and mannan tests were performed. A transjugular liver biopsy to exclude chronic hepatic rejection was also done. A positive galactomannan test and liver biopsy confirmed the diagnosis of hepatic *Aspergillus* infection. Initial antifungal treatment included voriconazole. In the absence of sufficient effect, liposomal amphotericin B was added for combination therapy. Hepatic and renal functions improved and the patient was discharged with appropriate treatment and outpatient medical care.

Summary. We report a case of a liver transplant recipient presenting with lymphocytic ascites caused by hepatic aspergillosis. The patient was diagnosed and successfully treated with combination antifungal therapy.

Conclusions. This clinical report showcases that hepatic aspergillosis in immunocompromised patients could be treated when a prompt and accurate diagnosis is made. However, the challenging treatment period raises important questions regarding the best diagnostic and management strategies for hepatic aspergillosis.

A CASE REPORT OF ACQUIRED PERFORATING DERMATOSIS

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Keywords. Acquired perforating dermatosis

Introduction. Acquired perforating dermatosis (APD) is an umbrella term for a group of rare skin disorders characterized by umbilicated lesions with transepidermal elimination of dermal connective tissue. This disorder appears in adulthood and often is associated with systemic diseases. Here we present a case of APD.

Case Description. A 40-year-old woman presented with a 3-month history of painful, spreading skin lesions. The lesions first appeared on the knees and then proceeded to spread. In the past, the patient was treated with antimicrobial and antifungal drugs with no effect. From medical history, it is known that the patient suffered from attention deficit hyperactivity disorder. Dermatological examination revealed 5 mm in diameter papules with crater-like ulceration, shiny surface in the periphery, and surrounding erythema on the anterior surfaces of the upper and lower limbs, on the chest, lower abdomen, and pubic area – locations that the patient can easily reach. The patient admitted trying to excoriate the lesions. Laboratory examinations showed an elevated erythrocyte sedimentation rate. Complete blood count, blood glucose level, and hepatic and renal function tests were normal. A skin biopsy revealed non-specific changes that could be the beginning of perforating collagenosis. The patient was treated with topical methylprednisolone 0.1% once a day, with satisfactory results on the follow-up visit.

Summary. In this report, we describe a case of a 40-year-old woman with a 3-month history of spreading ulcerous skin lesions. Serological tests showed no abnormalities. A diagnosis of APD was made based on clinical examination and skin biopsy results. The skin condition improved after treatment with a topical corticosteroid.

Conclusions. APD is an uncommon dermatosis with a challenging diagnosis and treatment, and no clear guidelines. Bearing in mind the high association between APD and systemic disorders regarding their development, it is important to rule out any underlying pathological condition.

WILSON'S DISEASE PATIENT WITH SEPSIS, MULTIPLE ORGAN DYSFUNCTION SYNDROME AND AMENORRHEA

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Keywords. SH2D1A; Structural variant; Immunodeficiency

Introduction. Wilson's disease (WD) is a rare autosomal recessive disorder caused by a mutation in the ATP7B gene. Clinical symptoms can vary widely, but the symptoms that are detected and appear most are neuropsychiatric disturbances and liver function complaints.

Case Description. We report on a 30-year-old patient with multiple organ dysfunction syndrome and sepsis. After the necessary investigations and genetic tests, the patient was diagnosed with WD. Unfortunately, it turns out that the first symptoms appeared at least 10 years ago with elevated liver transaminases and amenorrhea. It is possible that if any of the previous physicians had purposely examined this, the patient would have reached a diagnosis sooner. The patient received adequate penicillamine treatment and her condition improved. The patient manages to have a healthy child by slightly changing the treatment of Wilson's disease.

Summary. This case demonstrates that proper examination of the patient and collection of anamnesis leads to diagnosis. If other practitioners would have paid attention to elevated transaminases and amenorrhea, the patient might not have been hospitalized. That is why we want to emphasize the importance of targeted testing for elevated transaminases, especially if the patient has amenorrhea in reproductive age. This case is a good example that with proper treatment of Wilson's disease, the patient's menstrual cycle returns after as little as 10 months. Also, the patient manages to carry a healthy child on the background of Wilson's therapy in 2020.

Conclusions. This case demonstrates that proper examination lead to a diagnosis of WD. In addition, we want to emphasize the importance of targeted testing for elevated transaminases, especially if the patient has amenorrhea of reproductive age. Wilson's disease is not a barrier to carrying a healthy child. Of course, more research is needed to find the best treatment plan and disease management plan.

INDOOR AIR FUNGAL CONTAMINATION IN UNIVERSITY CLASSROOMS

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Keywords. Fungus; Relative humidity; Temperature; Indoor air quality

Objectives. Fungi are common in both indoor and outdoor air. Spores of pathogenic fungi for humans due to their ability to accumulate in the upper and lower respiratory tract can cause allergic rhinitis, bronchial asthma, itching, and dizziness. The aim of this study was to examine the concentration and variety of fungus in the air before, during, and after classes in university classrooms, to determine the current situation for further air quality improvement.

Materials and Methods. In total 13 microbiological (fungal) samples from two rooms were taken over a period of three days using "SAS SUPER ISO 100". These samples were then cultivated on Sabouraud agars. All colonies were then counted and identified using native smears and staining using safranin. All relative humidity and temperature average data was collected hourly by an LMT sensor. A record of the number of students in the class and recorded natural ventilation time and type (windows, doors) was taken.

Results. After inoculation of the samples, colonies formed on all 13 Sabouraud agars. The colony forming units per cubic meter (CFU/m³) overall fluctuated between 24–602 CFU/m³. All identified molds belonged to *Aspergillus* spp., *Penicillium* spp., *Mucor* spp., and *Cladosporium* spp. With 61.65% being part of *Mucor* spp., 32.01% part of *Penicillium* spp., 3.65% part of *Aspergillus* spp., 1.72% part of *Cladosporium* spp., and 0.97% were yeasts. The hourly average relative humidity fluctuated between 51.0–61.5%. The hourly average indoor air temperature fluctuated between 15.5–22.8°C.

Conclusions. All the found fungi are part of normal air microbiota. The colony forming units per cubic meter in the samples exceeded 150 CFU/m³, which means that the tested classrooms have significant microbiological pollution and subsequently there is a higher risk of developing health problems. Nearly all (99.03%) of the fungi found were molds (*Aspergillus* spp., *Penicillium* spp., *Mucor* spp., *Cladosporium* spp.).

TICK-BORN ENCEPHALITIS VIRUS MENINGEAL FORM AND LYME DISEASE (BORRELIOSIS) COINFECTION IN LATVIA: CASE REPORT

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Keywords. Tick-born encephalitis; Lyme disease; Borreliosis

Introduction. In Latvia, tick-born encephalitis and Lyme disease are not uncommonly diagnosed, but there are no data about coinfections. In 2020 a patient with nonspecific symptoms turned to the family doctor for help, which resulted in a diagnosis of tick-born encephalitis and Lyme disease coinfection.

Case Description. A 57-year-old male turned to the family doctor with complaints about a fever of up to 39° C for 6 days, a rash on his body and neck, and an itchy and sore forehead. There was also a rash on the inner folds of elbows and erythematous tonsils. Full blood count showed no changes outside of the normal range. At the start diagnosis of acute respiratory infection and reactive dermatitis was made. Symptomatic therapy was started, but when that was ineffective amoxicillin was prescribed.

A week later the patient presented with the same symptoms. Chest X-ray showed no pathology and full blood count was repeated, Yersinia antibodies in blood were negative, and Group A Streptococcal express test was negative. Since symptoms persisted, the patient was advised to seek medical attention at the hospital.

At the hospital, CT for the head was done, conclusion – old ischemia at the left basal nuclei. Cerebrospinal fluid was positive for tick-borne encephalitis virus IgM antibodies and Borrelia burgdorferi IgG and IgM antibodies. Also, blood serum was tested, which showed the same antibodies. Diagnosis of neuroborreliosis and tick-born encephalitis meningeal form was made. It was treated with Ceftriaxone for 12 days and symptomatic therapy. The patient was discharged on day 13th to continue therapy with doxycycline for 10 days.

Summary. Although tick-borne diseases are not uncommon in Latvia, the patient presented with nonspecific symptoms and signs, that could be present in other diseases. Coinfection of two infections made it even more difficult.

Conclusions. Tick-borne encephalitis and borreliosis coinfection should be considered differential diagnoses, especially in endemic areas. Even without known tick bites in recent history.

CHEMOTHERAPY-INDUCED CHANGES IN SKIN AND ITS DERIVATIVES IN HAEMATO-ONCOLOGICAL PATIENTS

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Keywords. Chemotherapy; Haemato-oncology; Skin; Skin derivatives

Objectives. The main method to treat numerous haemato-oncological diseases is chemotherapy. As far as we know chemotherapy has many side effects, also affecting the skin and commonly causing hair loss. The purpose of this study was to determine the most common dermatological side effects and their severity.

Materials and Methods. The data was obtained by surveying 42 patients. The questionnaire included information about received chemotherapy, diagnosis, and changes in skin and its derivatives. Changes have been documented by taking photos with patients' permission. Obtained data were analyzed using the IBM SPSS program. The study took place in the Latvian Oncology Centre, Chemotherapy and haematology department during 27.11.2022–7.01.2023

Results. The most common side effects were dryness: 34 (81%; $p < 0.001$) cases, 18 of them were severe, 14 – moderate, and 2 – mild and hair loss which was observed in 29 (69%; $p < 0.001$) patients, 1 patient had trichodynia before losing hair. Itching (7 cases; 16%), and pigmentation (8 cases; 19%) were experienced infrequently. Nails were affected rarely. After initiation of the therapy 5 (12%) patients had onychomycosis (agent unknown) on toenails and 1 – pityriasis versicolor. One patient had a recurrent bacterial infection – erysipelas on the right lower extremity. Reactivation of Herpes Simplex Virus (9 cases; 21.4%; $p = 0.004$) was observed more often and also caused more discomfort because of localization (genital and gluteal region). Mucous membranes of the mouth were affected in 15 (35.7%; $p = 0.008$) cases. Local skin reactions were observed in subcutaneous Azacitidine group patients who experienced pain, erythema, and swelling at the injection site, 3 patients had pigmentation after.

Conclusions. After receiving chemotherapy patients expect hair loss but more frequently experience greater discomfort due to dryness which tends to be long-lasting and without improvements. Side effects are various and depend on chemotherapy dosage, way of administration, and patient's body response. Patients should be more educated about the diversity of the side effects and the opportunities to improve their condition.

LEVEL OF LACTATE DEHYDROGENASE IN PATIENTS WITH DIFFERENT SEVERITY OF COVID-19

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Keywords. COVID-19; LDH; Severity; Tissue damage

Objectives. Lactate dehydrogenase (LDH) is a cytoplasmic enzyme of the anaerobic metabolic pathway that is present in almost all tissues but at high concentration in muscle, liver, and kidney. The level of LDH in serum increases during cell destruction and is associated with different clinical conditions, including lung diseases. Lungs are the main organs involved during acute COVID-19. This study aimed to investigate the relationship between LDH and COVID-19 severity.

Materials and Methods. Data for analysis were obtained from the RSU database DataVerse: <https://dataverse.rsu.lv/dataset.xhtml?persistentId=doi:10.48510/FK2/ATVBQE>. The study group included 101 patients with confirmed SARS-CoV-2 infection hospitalized in 2020. Patients were divided into three groups (non-severe, severe, and critical) according to the World Health Organization COVID-19 severity definition. For analysis data of LDH, interleukin 6 (IL-6) and other standard blood tests at admission to the hospital were used.

Results. In non-severe patients ($n = 58$), the median level of LDH was 241 U/L, IQR (195; 316); in severe ($n = 30$) patients – 350 U/L, IQR (263; 454); and in critical ($n = 8$) patients – 413 U/L, IQR (290; 447). The comparison with the Kruskal-Wallis test revealed statistically significant differences among groups of patients, χ^2 ($df = 2$) = 17.91, $p < 0.001$. The following comparison demonstrated that the level of LDH in the non-critical group was significantly lower than in severe and critical groups ($p < 0.05$). The difference between the severe and critical groups was non-significant ($p > 0.05$). In addition, the level of LDH demonstrated positive correlations with IL-6 ($r_s = 0.45$, $p < 0.001$) and patients' age ($r_s = 0.27$, $p < 0.001$).

Conclusions. LDH is associated with COVID-19 severity and related to a higher level of inflammation.

PREVALENCE OF MORPHOLOGICAL SUBTYPES OF BASAL CELL CARCINOMA IN ACADEMIC HISTOLOGY LABORATORY

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Keywords. High-risk basal cell carcinoma; Skin cancer; Infiltrative; Micronodular

Objectives. About 75% of all skin cancer cases are basal cell carcinomas. Although it accounts for less than 0.1% of cancer patient deaths, high-risk subtypes (infiltrative, basosquamous, micronodular) are more difficult to treat and are associated with higher morbidity compared to low-risk subtypes (superficial, nodular, pigmented). The objective of this study was to evaluate the spread of basal cell carcinoma morphological subtypes according to the available data in the SIA “Academic Histology Laboratory” for the years 2020 and 2021.

Materials and Methods. This study collects information on 1016 patients with basal cell carcinomas from the SIA “Academic Histology Laboratory” database. The research was approved by the Ethics Committee of Riga Stradins University (Nr. 22-2/610/2021). Data were summarized using MS Excel and analyzed with SPSS.

Results. Of all patients 66.54% were women, and 33.46% were men. The median age of patients was 65 years. The most common location for cancer was back (24.12%), followed by the cheek (8.24%) and the nose (7.76%). The most common subtypes were nodular (48.16%), superficial (29.73%), and infiltrative (11.05%), the less common were mixed (6.23%), micronodular (1.52%) and pigmented (1.27%). In total 2.92% of patients had more than one basal cell carcinoma. Surgeons performed 530 excisions, dermatologists 215, and oncologists 10². Dermatologists performed 113 punch biopsies, surgeons 5, and oncologists 1. Surgeons had 45.36% of patients with nodular 27.59% with superficial, and 14.59% patients with infiltrative basal cell carcinomas. Dermatologists had 46.92% of patients with nodular 33.90% with superficial 7.53% with mixed, and 6.16% with infiltrative basal cell carcinomas. Oncologists had 66.67% of patients with nodular, 12.70% with infiltrative, and 11.11% with superficial basal cell carcinomas.

Conclusions. Although most of the cases refer to low-risk basal cell carcinomas, almost one in five patients with basal cell carcinoma has high-risk carcinomas such as infiltrative, micronodular, and mixed.

SHORT-TERM OUTCOMES OF PATIENTS WITH MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN

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Keywords. MIS-C; Post-COVID-19; Paediatrics; Outcomes; Persistent symptoms

Objectives. In the paediatric patient population, COVID-19 infection as reported in the scientific literature is mostly mild or asymptomatic. However, some patients develop a multi-system inflammatory syndrome in children (MIS-C) 2–6 weeks later. This hyper-inflammatory syndrome often proposes a life-threatening condition requiring intensive care. However, there is still limited data on the sequelae of MIS-C. The aim of this study was to describe the symptoms and laboratory findings in patients with MIS-C at the time of diagnosis and at the 3-month follow-up.

Materials and Methods. This prospective cohort study included the Children's Clinical University Hospital patients diagnosed with MIS-C since January 2021. Patients were followed up 3 months after admission. Laboratory profiles and persistent symptoms were recorded and analyzed.

Results. 21 patients who had full 3-month follow-up data were included in this study. The median age was 6.9 years, and 47.6% were male. 71.4% had a previously known SARS-CoV-2 infection, all were SARS-CoV-2 seropositive. All patients presented with fever, rash, and cardiovascular symptoms, most patients had neurological deficiencies (95.2%), lymphadenitis (85.7%), gastrointestinal symptoms (85.7%), and conjunctivitis (81%). All patients had elevated inflammatory markers in the acute phase. Median CRP 138.0 mg/L (IQR 104.0–238.5), IL-6 162.0 pg/ mL (IQR 88.4–254.0), ferritin 434.5 ng/mL (IQR 251.8–653.2). By 3-month follow up most patients did not report any persistent symptoms. During the follow up 2 (9.5%) patients reported having persistent gastrointestinal symptoms (nausea, reduced appetite), and 3 (14.3%) patients had persistent neurological deficiencies (difficulty concentrating, memory impairment, irritability). The inflammatory marker profile had normalized.

Conclusions. Despite serious illness and multi-systemic inflammation during the acute phase, most MIS-C patients recover without serious sequelae at a 3-month follow-up. Larger cohorts and longer-term follow-ups are needed to fully assess the incidence of persistent symptoms after MIS-C.

BACTERIAL COLONISATION OF STETHOSCOPES IN PEDIATRIC AND REGIONAL HOSPITAL

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Keywords. Stethoscopes; Bacteria; Nosocomial infections; Medical personnel pediatric hospital; Regional hospital

Objectives. Nosocomial infections are a major concern in hospitals. It has been suggested that stethoscopes could act as a potential source of disease transmission. The purpose of this study was to determine the presence of bacterial contamination on the stethoscopes used to examine patients by medical personnel at the Children's Clinical University Hospital (CCUH) and a regional hospital (RH).

Materials and Methods. 64 stethoscopes from 13 different units, belonging to physicians and residents, were sampled for bacterial cultures by swabbing the entire surface of the diaphragm of the stethoscope with a sterile cotton-tipped applicator, placed in Amies transport medium. Next cultures were transferred to blood agar, mannitol-salt-agar, and Levine EMB agar plates. The plates were incubated at 37°C for 24 hours and examined for colony growth, then Gram stained and microscopied. Next using the streak plate method was transferred to Trypticase Soy Agar to obtain a pure culture that could be used in VITEK-2 for accurate microbial identification.

Results. Bacteria were found on 97% (62) of the sampled stethoscopes: CCUH 97% (33), RH 90% (27). In comparison between CCUH and RH: Gram-negative cultures (15% (5); 19% (5)), Gram-positive (76% (25); 11% (3)), a combination of Gram-positive and Gram-negative (6% (2); 63% (17)), unidentified (9% (3); 7% (2)). The most prevalent species in CCUH were Staphylococcus 48% (16) with one case of coagulase-positive Staphylococcus aureus and Enterococcus 15% (5), in RH Enterobacteriaceae (E.coli) 70% (19) and Staphylococcus 63% (17) with one case of coagulase-positive Staphylococcus aureus.

Conclusions. 97% (62) of sampled stethoscopes were colonized by various groups of bacteria, which shows that stethoscopes are potential vectors for the transmission of bacterial infections. These results raise awareness of the importance of regular medical device disinfection. Future research about resistance patterns of isolated cultures needs to be considered.

KNOWLEDGE ABOUT HUMAN PAPILLOMAVIRUS AND VACCINATION AGAINST IT: A WEB-BASED SURVEY

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Keywords. Human papillomavirus; Vaccination; Survey

Objectives. The human papillomavirus is one of the most common viruses detected in children and young adults. The only way to protect against the virus's negative effects is vaccination. The study aims to evaluate the Latvian population's knowledge about the human papillomavirus and vaccination.

Materials and Methods. A cross-sectional survey was published during the time February 2021 to October 2021. Participants completed an anonymous survey, which included 19 questions, assessing age, sex, education, thoughts about vaccination, and knowledge about the Human papillomavirus. The results were statistically analyzed using IBM SPSS 28.

Results. The survey was completed by 277 participants, 188 females, and 89 males. 82.3% of participants have heard of human papillomavirus and there was a statistically significant difference between genders – females have a higher tendency to know about the virus than males ($p < 0.001$). 82% of the respondents know, that the human papillomavirus can proceed without symptoms. 74.4% of the participants falsely believe, that there is a treatment for this disease. The opinion on whether the partner should be vaccinated had statically significant differences between vaccinated and unvaccinated participants – the vaccinated respondents prefer that their partner is vaccinated, but unvaccinated participants do not think that their partners should be vaccinated ($p < 0.001$).

Conclusions. The study implies that people, who have been vaccinated, have different opinions and better knowledge of vaccination than the ones that have not received the vaccine. To increase vaccination coverage and public knowledge about this disease, it is important to organize more effective and wider educational campaigns.

NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN AS A BIOMARKER IN POST-ACUTE COVID-19 SYNDROME

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Keywords. SARS-CoV-2; COVID-19; NGAL; Post-Acute COVID-19 syndrome

Objectives. This study addresses the role of Neutrophil Gelatinase-Associated Lipocalin (NGAL) in Post-acute COVID-19 syndrome (PACS). Our objective was to establish levels of serum NGAL in the population of patients after the acute phase of the disease and establish factors contributing to prolonged NGAL elevation in the mentioned cohort.

Materials and Methods. The study included 146 patients diagnosed with COVID-19 in different stages of the disease. 3 months after the COVID-19 diagnosis patients' serum was sampled and tested. Patients were questioned for the presence of pre-existing diseases and selected symptoms existing at the time point of serum sampling.

Results. We established serum NGAL levels in patients 3 months after SARS-CoV-2 infection and determined that it was significantly elevated compared to the control group. We demonstrated the association between the severity of the disease and prolonged elevation of serum NGAL levels except for the 4th stage of the disease where NGAL levels remained lower. Moreover, NGAL levels were moderately higher in patients suffering from asthma and COPD and those who reported appetite loss.

Conclusions. NGAL levels remain elevated even after 3 months since the acute phase of COVID-19 disease proving the possible role of NGAL in PACS. Prolonged elevation of NGAL is associated with COVID-19 severity, although administration of steroid and antiviral treatment during the acute phase of the disease could reduce NGAL levels. Higher NGAL levels are associated with appetite loss, one of many symptoms observed in PACS.

ANALYSIS ASSOCIATION BETWEEN COVID-19 VACCINATION RATES AND DEATH CASES IN UKRAINE

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Keywords. COVID-19; Vaccination; Mortality; Ukraine

Objectives. The COVID-19 pandemic is still an important problem of concern in Ukraine. The rapid deployment of the vaccination program is important for the formation of herd immunity, which helps to prevent the rise in morbidity, hospitalization, and mortality rates. The aim of the study was to examine trends in COVID-19 vaccination and their associations with morbidity and mortality in Ukraine.

Materials and Methods. Data collection on COVID-19 vaccination and new cases were derived from the website of the Ministry of Public Health of Ukraine. A retrospective-archive study was conducted in Ukraine from March 3rd, 2021 (the patient zero case) to April 30, 2022. The beginning time point for accessing COVID-19 vaccination data was From February 24, 2021, to January 16, 2022.

Results. The highest level of mortality was detected during the third wave of COVID-19 in November 2021 with 4,622 weekly death cases. The maximal level of vaccinations was achieved with Pfizer/Biontech and Coronavac vaccines. The weekly fully vaccinated count of total cases with 2 doses by vaccine Pfizer/Biontech was 6426131 persons (Median 172895 [IQR 98671 – 216924]), vaccine Coronavac – 4588924 persons (Median 98956 [IQR 136080 – 57773]). There was a shift in time after the 2nd dose of vaccines from 3 to 9 weeks. It detected a functional relationship between mortality and vaccination parameters, which are described in the model by a linear regression equation ($R^2 = 36\%$; $F = 30.56$; $p < 0.05$).

Conclusions. Vaccines serve as an effective means to curtail and manage outbreaks during the pandemic period in Ukraine.

STORAGE OF BACTERIOPHAGES: DOES REFRIGERATION AFFECT THE STABILITY OF PHAGE STOCKS?

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Keywords. Lytic bacteriophages; Refrigeration; Bacteriophage stability; Titer

Objectives. Antimicrobial resistance is recognized as an urgent global challenge in public health. High importance is to find a promising alternative strategy to commonly used antibiotics when preventing and treating bacterial infections. Lytic bacteriophages (phages) are prokaryotes viruses that infect and kill their hosts and therefore have an excellent potential for future application in medicine. As for biological forms, the viability of phages may vary in different conditions over time. For clinical application, it is crucial to maintain stable viral titer of phage stock when phage therapy is considered. Thus, our study aimed to evaluate phage stability under refrigerated conditions at 4°C over a five-month period.

Materials and Methods. To observe and detect any possible phage titer fall during storage under refrigeration, one reference bacterial *Pseudomonas aeruginosa* strain CN573 and two bacteriophages PT07 and PNM (prepared for therapeutic use by our scientific collaboration partners from the Queen Astrid Military Hospital in Brussels, Belgium) were studied on a clinical case basis. A plaque assay was executed to determine the viral titer, expressed as plaque-forming units per milliliter (PFU/mL). The procedure was repeated every two months, from August to December 2022. All experiments were duplicated to enhance accuracy.

Results. Original titers were as follows: titer of the freshly received PT07 bacteriophage was 1.0×10^{12} PFU/mL, whereas the PNM bacteriophage titer was 2.0×10^{12} PFU/mL. After the first repetitive plaque procedure (i.e., serial dilution and plating with susceptible host strain), PT07 and PNM phage stocks showed a 2-log (3.9×10^{10} PFU/mL) and 1-log (3.2×10^{11} PFU/mL) decrease in titers, respectively. Two months later, no log decrease in both phage stocks was observed compared to October's results.

Conclusions. Refrigeration maintained phage stocks' stability starting from the first repetitive plaque procedure. Further investigations are needed to represent stability-determining parameters of prepared phage stocks and prevent potential phage titer fall.

ORTHOPEDICS–TRAUMATOLOGY, REHABILITATION, MILITARY & SPORTS MEDICINE

A MEMBER OF MULTIDISCIPLINARY TEAM: TOTAL SHOULDER ARTHROPLASTY HUMERAL IMPLANT LOOSENING IN IMMUNOCOPROMISED PATIENT

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Objectives. Patients who have undergone total shoulder arthroplasty(TSA) should be monitored vigorously. International consensus meeting Philly suggests radiological findings such as non-traumatic periprosthetic fracture, fracture of arthroplasty material, osteolysis without loosening, periosteal new bone formation etc. should be considered as periprosthetic infection.

64 years old female, 30.03.2013 fell on her right shoulder sustaining right humerus proximal metaphysis fracture. She has been treated non-operatively in regional hospital for several months without bone consolidation. CT and MRI rise a suspicion of bone malignancy. 05.11.2013 open biopsy confirmed bone neoplasm – plasmacytoma. 13.11.2013 partial right humerus resection, TSA with Delta Extend prothesis. Post operative period went without complication, regained function of the arm. Haematologist started multiple myeloma treatment with chemotherapy and immunosuppression.

Patient came for check-ups annually. 01.12.2020 X-ray and MRI findings displayed humerus implant loosening, free fluid collection, inflammation in the soft tissues, suspicion of recurrence of malignancy.

In 2021 patient fell on her operated shoulder and a lump developed on operated site.

12.08.2022 check up in outpatient clinic. Patient complains about pain in her right shoulder and exudative fistula. Microbiological sample – methicillin sensitive *S. aureus*(MSSA).

29.09.2022 revision surgery–evacuation of the implant, debridement, cement spacer with vancomycin. Microbiological sample from surgical site – MSSA. Pathohistological sample – chronic low-grade active inflammation of the soft tissues, bone trabeculae with osteosclerotic changes, no signs of oncopathology. Patient continued suppressive and antibiofilm a/b therapy.

18.10.2022. cement spacer removal, right shoulder joint revision with Mutars®

EP. 22.10.2022 two days after discharge patient dislocated shoulder prothesis. In the emergency department under general anaesthesia the shoulder was reduced in closed manner.

Up to this day, patient continues with physical therapy

In cases of radiographic TSA implant loosening periprosthetic infection should be excluded. Immunocompromised patients should be treated by multidisciplinary team due to higher risks of complications

BEHAVIOUR OF DAILY PHYSICAL ACTIVITY IN SENIORS WITH CHRONIC CARDIOVASCULAR DISEASE – ANALYSIS OF EFFECTS OF INTERNAL FACTORS

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Objectives. To study the behavior of daily physical activity and analyze its internal determinants in the context of – health literacy and disease management self-assessment, symptoms of anxiety/depression and exercise tolerance of seniors with chronic cardiovascular disease.

Materials and Methods. The design of the cross-sectional study was chosen for the study. The sample consisted of 30 seniors with chronic cardiovascular disease. All were assessed for daily physical activity with accelerometry, health literacy, self-management of health status, symptoms of anxiety and depression with self-assessment questionnaires, aerobic capacity and endurance with a six-minute walk test. Data were analyzed using descriptive and analytical statistics (correlation and logical regression methods).

Results. 73.3% of the studied seniors sedentary spent more than eight hours a day on average. Only 37% of the sample's physical activity behaviour met accordance with the recommendations for secondary prevention of cardiovascular disease. Half of the participants rated health literacy as sub-optimal or limited, and almost all rated the disease management ability as moderate or low, while half had mild to moderate symptoms of anxiety and / or depression. Regression analysis confirmed the determinant effect of all five analyzed internal factors as a set ($p < 0.05$) on the compliance of physical activity behavior with the recommendations. An independent influence was observed only for the symptoms of anxiety and depression, which increased non-execution.

Conclusions. There is reason to think that there is a lack of understanding of the recommendations for physical activity for secondary prevention, pointing to the need to ensure the dissemination of individually tailored information that is understandable to seniors. Given that the behavior of physical activity is determined by all the internal factors analyzed as a whole, the change in the behavior of physical activity must include complex interventions, targeted at all factors simultaneously.

BIMALLEOLAR FRACTURE: POSTOPERATIVE PERIIMPLANT INFECTION

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Objectives. Ankle fractures are common in geriatric population. Options of ankle fracture treatment are both nonoperative and operative. Most of the reported complications are related to the patient's medical condition and surgical intervention. In this clinical case, the use of Vishnevsky's balsamic ointment can be mentioned as the cause of the infectious complication as it contributed to the multiplication of *S.aureus* in the surgical wound.

A 61-year-old male was brought to the admission with complains of pain in the left foot joint after the patient fell while walking. During the examination, a closed bimalleolar fracture of the left leg with dislocation was found, it was decided on operative therapy – osteosynthesis with a plate. The recovery process went smooth and on the fourth day of hospitalization, the patient was discharged for outpatient treatment.

One month after the fracture osteosynthesis, patient came to the hospital with recurrent pain in the left foot joint, soft tissue edema, non-healing surgical wounds and discharge from them. *S.aureus* grew on inoculation of discharge from wounds. Patient, while collecting anamnesis, noted that Vishnevsky's balsamic ointment was additionally used when caring for postoperative wounds at home.

Patient was diagnosed with a postoperative peri-implant infection. When treated with antibiotics intravenously, patient's condition did not improve. It was decided to operate and remove the implants after sufficient consolidation of the bone to fight the infection and prevent its further spread.

The patient's condition improved, he underwent medical physiotherapy under the supervision of doctors and after 24 days of hospitalization was discharged for further outpatient treatment. Patient made a full recovery. Conclusions: traumatological, orthopaedic patients often have complications involving skin microflora, the most common cause of infection is *S.aureus*. Patients should be educated about post-operative wound care more.

CALCANEAL FRACTURE TREATMENT USING EXTERNAL FIXATION COMBINED WITH MINI-INVASIVE INTERNAL FIXATION METHODS

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Objectives. Introduce new calcaneal fracture treatment strategy and algorithm using external fixation combined with mini-invasive internal fixation methods

Materials and Methods. Prospective study, in which 5 patients (all males) were treated by given algorithm with acute calcaneal fracture in time period from July 2021 till May 2022. In admission to hospital all patients were rated by ABCDEF Calcaneal Risk Scale. If ABCDEF Calcaneal Risk Scale was 13 or more, then patient was operated by temporary external fixation as emergency procedure with varus and length correction. After soft tissue recovery (reduced edema, positive wrinkle sign of skin) second surgery was performed – fracture mini-invasive internal fixation with external fixation as assistance for bony fragment reduction by given standartized surgical protocol.

Results. All patients had follow up at least 3 months after definitive surgery and there were no wound healing complications or infections. All patients have returned to their previous activity levels

Conclusions. Given treatment algorithm and surgical protocol allows to reduce surgical complications risks and improves functional outcomes. However, small amount of patients doesn't give statistical reliability and study must be continued.

COMPARISON OF DEMOGRAPHIC, CLINICAL CHARACTERISTICS, AND MOBILITY LEVEL BETWEEN BILATERAL AND UNILATERAL LOWER LIMB AMPUTEES WHO RECEIVED PROSTHESES IN LATVIA

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Objectives. Compare demographics, clinical characteristics, and functional mobility levels between unilateral (UL) and bilateral (BL) lower limb amputees who received prostheses.

Materials and Methods. In this quantitative retrospective study, data was collected from the national assistive device system in Latvia from the year 2019. Analyzed data: age, gender, cause of amputation, mobility level (AMP PRO, AMPnoPRO), and assistive devices. Performed data analysis: descriptive statistics. Pearson chi-square and Fisher's exact tests were used to determine the significance between BL and UL amputees.

Results. Age: $M(BL) = 58.62$, $SD = 13.01$ and $M(UL) = 59.94$, $SD = 15.13$ years. There was no significant difference between BL and UL amputees in age and gender. There was a significant difference in the causes of amputation, mobility levels, preliminary(PL) and permanent(PM) prosthetic candidates between BL and UL amputees. BL were more likely to be caused by trauma, but UL by vascular causes (two-tailed, $p = 0.002$). UL amputees were more likely to be k-level 3 and 4 but BL amputees k-level 1 ($t(3) = 50.084$, $p < 0.000$). Similarly, UL and BL amputees had differences in BL/PL, UL/PL and BL/PM, UL/PM groups in k-levels. Regardless of which group, PL or PM, the UL amputees were more likely to have k-level 3 and 4 and the BL k-levels 1 and 2. ($H(3) = 32.507$, $p < 0.000$).

Conclusions. In conclusion, there is no difference in demographics between groups. Despite the vascular patient's increased risk for amputation of a contralateral leg, the most common BL amputee cause was found to be trauma. Our results indicate there is a difference between PL and PM groups in both UL and BL amputees. Further analysis is necessary to define if this difference is caused by an increase in k-level from PL progressing to PM or a different variable.

DEFINITIVE RECONSTRUCTIVE SURGICAL MANAGEMENT OF COMPLEX MILITARY TRAUMA OF THE UPPER RIGHT LIMB AT RIGA EAST UNIVERSITY HOSPITAL

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Objectives. Military or war injuries are becoming more and more relevant. This is a serious challenge in medical treatment due to the increased number of victims, limited resources, and different severity of injuries. Staged treatment has been introduced in war medicine, which begins with damage control surgery, followed by definitive surgery performed outside the war zone. Latvia actively participates in the treatment of war trauma patients.

Materials and Methods. Patient: 35 y.o. male was hospitalized during the military conflict in July 2022. As a result of an explosion, he received an injury to his right arm with extensive bone, soft tissue, and neuromuscular damage. Initially, the patient underwent damage control surgery in the war zone, debridement, the right hand was immobilized using an external fixation device, and both local flap and autodermoplasty were performed. Non-reconstructable defect of the distal end of the right humerus with damage to the elbow joint, with no possibilities of prosthodontic treatment. Radial nerve complete damage and limited flexion in the right wrist were observed.

Results. In December 2022, the patient underwent surgical intervention at Riga East University Hospital, reconstruction in one anatomical region – debridement was performed, and an osteomyocutaneous flap was prepared – from the middle and proximal third of the right radius, it was rotated and fixed with a plate at the middle part of the humerus and the proximal part of the ulna. External fixation was applied. A Radial nerve reconstruction was performed with a nerve graft. The postoperative period was without complications. In the next stage, January 2023, autodermoplasty is performed to close the remaining tissue defect

Conclusions. Evaluated all possible treatment options for this type of injury – elbow joint prosthesis, a bone transplant from the fibula, or even amputation. Result of the planning, a regional osteocutaneous flap was chosen as the best form of treatment

DEVELOPMENT OF ANATOMICAL OPTIMISED INTRAMEDULLARY NAIL FOR TREATMENT OF PROXIMAL EXTRAARTICULAR TIBIA FRACTURES

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Objectives. Intramedullary nailing of proximal extra-articular tibial fractures is compromised by fracture malalignment. Suprapatellar tibial nailing in semi-extended position of the knee may help to resolve this problem, but the design of the traditional tibial nails may also contribute to problems during nail insertion and malalignment of the fracture. The aim of this study was to evaluate a new tibial nail design with the potential to support fracture reduction and reduce the risk of fracture malalignment. In addition, the nail should be easy to insert and optimized for the suprapatellar approach.

Materials and Methods. We conducted this study in 19 human bodies of donors (9 female, 10 male, average age 81.5 years). After intramedullary reaming, a flexible polytetrafluoroethylene (PTFE) tube was inserted into the reamed canal. CT scans were performed to analyze the reamer pathways after both suprapatellar and infrapatellar insertion of the PTFE tube.

A prototype of a suprapatellar nail was manufactured based on this analysis and insertion- and fracture-reduction investigations were performed in a human fracture model in 8 specimens. The cumulated impulses, needed for nail insertion, were measured via an oscilloscope. Fracture reduction was evaluated by an optical 3D measurement system (PONTOS).

Results. Significant differences between the geometry of the suprapatellar reamed canal and the infrapatellar canal could be demonstrated.

The manufactures prototype of a suprapatellar tibia nail could be easier inserted into standardized fractured human tibiae. The analysis of the fracture reduction after the nail insertion shows significantly better results for the anatomical optimized prototype.

Conclusions. Suprapatellar tibial nailing could be improved regarding to nail insertion and fracture reduction by using a nail adjusted to the anatomical conditions of the specific reamed canal and the operative technique.

DIFFERENCES BETWEEN ELECTROCARDIOGRAPHIC FINDINGS IN ICE HOCKEY, FOOTBALL AND BASKETBALL JUNIOR ATHLETES

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Objectives. Each year two of all children in Latvia until the age of eighteen dies from heart problems that could be noticed by regular electrocardiography (ECG). Some of these children had been suffering from heart conditions but haven't showed up in follow-up tests or continued to exercise with inappropriate workload.

Materials and Methods. Totally 900 junior athletes ECG's at the age of twelve, fourteen and sixteen were analyzed. ECG's were taken from Latvia's sports physical health tests, which included 900 ECG's at rest, 900 after physical activity. Findings were assessed according to the Seattle criteria.

Results. Wandering atrial pacemaker in 3.66% (N = 33) cases, most in basketball players 54.5% (N = 18). Early atrial repolarization was found in 2.55% (N = 23) cases, most in ice hockey players 60% (N = 14). Juvenile T waves were found in 4.88% (N = 44) cases, most were found in ice hockey player ECG's 47.7% (N = 21). Incomplete RBBB was found in 18.8% (N = 170) cases. 75% of them were found in basketball and hockey. Prolonged QT interval was found in 0.2% (N = 2) cases one in basketball, and football. 1st degree AV block was found in 0.7% (N = 7) cases, four of them were in football 57% (N = 4). WPW syndrome was found in 0.4% (N = 4) cases, most of them was in basketball 50% (N = 2). 2nd degree AV block (Mobitz1) was found in 0.2% (N = 2) cases one in basketball, one in hockey. Sinus arrhythmia was found in 32.6% (N = 294) cases, most of them in hockey 67.3% (N = 198).

Conclusions. From 900 junior athletes six abnormal ECG findings according to Seattle criteria were found - two ECG's with prolonged QT and four ECG's with WPW syndrome. These athletes require more specific cardiac evaluation and it's necessary to determine adequate workload for them. Other ECG findings classifies as normal, and don't need further evaluation however that refers to asymptomatic athletes with no family history of inherited cardiac disease or sudden cardiac death.

DIGITAL PEDOBAROGRAPHY EVALUATION FOR HALLUX VALGUS DEFORMITY

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Objectives. Hallux valgus is the common forefoot disorder. Evaluation of foot deformities, using digital pedobarography has importance for early diagnostics and treatment. The aim of the research was to analyze foot deformities in hallux valgus patients.

Materials and Methods. Study of 32 patients (28 women, 4 men) who visited orthopaedic surgeon with bilateral hallux valgus deformity Saldus Medical Center in 2022, was conducted. For the foot examination static digital pedobarography was used (Medacpateurs T-PLATE 30th).

Results. Patients age was 20 to 70 years (mean 50.81), weight 50 to 140 kg (average 80.78 kg), height 153 to 191 cm (average height 168.91 cm). Foot size for patients was between 37 to 47 (average 40.25). Surface area for left foot 64 to 154 cm² (average 101.41 cm²), right foot from 62 to 181 cm² (average 103.28 cm²). Maximal pressure in left foot from 541 to 1294 g/cm² (average 797.44 g/cm²), right foot 524 to 1294 g/cm² (average 762.25 g/cm²). We compared pedobarography measurements of these patients with control group (9 women, 3 men) without hallux valgus deformity. In the control group both feet average surface area was 176.5 cm², average maximal pressure – 894 g/cm².

Conclusions. The results of digital pedobarography measurements show that average foot surface area in patients with hallux valgus has tendency to be increased and average maximal pressure of feet – to be decreased, thus indicating flattening of the transverse foot arch and varosity of first metatarsal bone.

DISORDERED EATING – CURRENT SCREENING PROBLEMS IN ATHLETES: LITERATURE REVIEW

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Objectives. Disordered eating is a serious issue in sports medicine and can occur in any athlete at any time. To avoid serious outcomes, subsequently early screening is encouraged.

Materials and Methods. Literature search on PubMed was done in January 2023 using the following search keywords “athlete”, “eating disorder”. Search results included 49 free full text articles written in the English language from 2018 to 2023. Articles addressing screening of eating disorders in athletes were selected for inclusion in the review.

Results. A total of 6 articles were identified regarding screening of eating disorders in athletes. Several different screening tools have been mentioned in these articles addressing problems in their use due to individual factors. Research shows a high prevalence of disordered eating in athletes (2–45%). Due to pressure, regulations and sports specific expectations athletes may present differently and are more prone to normalize these practices (food rituals, compensatory or rigid eating behaviors). Athletes participating in sports where thinness, aesthetics, weight categories are important, have higher risk of disordered eating than athletes from other sports. At the same time there are gender differences (clinical presentation, shame, stigma in male athletes and commentaries, expectations affecting more female athletes). Higher risk to develop eating disorders have been found in elite athletes, while athletes competing in lower levels show higher risk than non-athletes.

Conclusions. Due to individual peculiarities, disordered eating in athletes might be overlooked using currently available tools. Athletes, coaches and sports medicine physicians should be educated and well informed. Sports and gender specific, individualized screening tools to detect disordered eating early should be developed in sports medicine.

FIRST EXPERIENCE ON ABBOTT MTBI TEST USE IN CLINICAL PRACTICE

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Objectives. Examine the specificity and accuracy of the *Abbott mTBI (mild traumatic brain injury)* biomarker in patients with mild head trauma and confirm the reliability of use in clinical practice. To potentially reduce the head CT scan quantity and lower the cost for the health care.

Materials and Methods. The specific *Abbott mTBI* biomarker was used in patients with mild head trauma. The mTBI test is a panel of in vitro diagnostic chemiluminescent microparticle immunoassays (CMIA) used for the quantitative measurements of glial fibrillary acidic protein (GFAP) and ubiquitin carboxyl-terminal hydrolase L1 (UCH-L1) in human plasma and serum. Glial fibrillary acidic protein (GFAP) and ubiquitin carboxyl-terminal hydrolase L1 (UCH-L1) are brain specific proteins that can be measured in serum and plasma in the acute phase following TBI. Interpretation of the result was “positive” or “negative”. From August, 2022 till October, 2022 total of 108 patients over 18 y.o. with mild traumatic brain injury (GCS > 13) were tested for *mTBI* biomarker and had a CT scan of head.

Results. Concordance with CT scans – all test-negative patients showed negative CT findings in 15 patients. In 72 patients with anamnesis of head trauma had a positive *mTBI* test result and no findings in the CT scan. All 20 patients with CT scan findings like contusions, SDH, ICH etc., had a positive test results. One patients had no history of head trauma and got a positive biomarker result.

Conclusions. Test is innovative and requires further study. In the future use of tests may reduce the number of CT scans as well as the time patients spend in the ED. Further study requires a group of patients who have no brain damage on CT but have a positive *mTBI* test. It should also be added that head injuries can include bone fractures in which the test may be negative.

GAIT VARIABILITY DURING BAREFOOT AND SHOD WALK AMONG MILITARY PERSONNEL

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Objectives. Evaluate gait variability parameters when walking barefoot and in military boots among previously injured and non-injured infantry soldiers.

Materials and Methods. Cases ($n = 32$) were active-duty infantry male soldiers from Latvian Land Forces with a medical-record based history of lower leg overuse injury during the last 6 months of service before entering the study. During the study, cases recovered completely from the injury, did not report any functional limits, and were able to participate in all kinds of physical activities. Age and gender matched controls ($n = 32$) were free of injury. Biomechanical gait analysis was performed in Rehabilitation Research Laboratory of Rīga Stradiņš University. Stride time, stride length and variability were evaluated for barefoot and shod conditions.

Results. The barefoot walk showed shorter stride length ($r = 0.64$) and increased stride time ($r = 0.52$) and stride length variability ($r = 0.74$) compared to the shod walk among both study groups. Barefoot stride time ($p = 0.053$) and stride time variability ($p = 0.030$) were statistically different between cases and controls, effect sizes $r = 0.31$ and $r = 0.85$ respectively. During the shod walk, only the stride time was statistically different between the study groups ($p = 0.048$, $r = 0.36$). In univariate and multivariate analysis, only stride time variability (OR = 2.71, 95% CI 1.31–5.60, $p = 0.007$) during barefoot walking statistically significantly predicted the risk of lower leg overuse injury. ROC analysis of stride time variability showed an AUC (area under curve) of 0.77 ($p < 0.001$; 95% CI 0.648–0.883), a sensitivity of 56%, and a specificity of 88%, with an optimal cut-off value 1.95%.

Conclusions. The stride time variability has low sensitivity, and if the variability value is greater than 1.95% then the injury risk is greater. Stride time variability of less than 1.95% can be considered a negative or risk factor.

IMPLANT CHOICE IN COMPLEX REVISION KNEE ARTHROPLASTY

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Objectives. With growing numbers of primary knee replacement surgery accordingly also need for revision arthroplasty has increased. After the previous implant has failed, bone defects, deformities and soft tissue management requires surgeons experience and understanding of surgical principles for revision implant stability and good clinical outcome for the patient.

For revision implant to be successful careful planning of implants with additional stems, augments, sleeves should be used. Trabecular metal has showed excellent results of bone ingrowth when in good contact with bone surface, for stems correct length and cemented or uncemented fixation can differ, although short cemented stems could be superior choice in many cases.

Although fracture of an implant is a rare complication, we present two cases of complex knee replacement following implant failure.

67 y.o. female had undergone first revision knee arthroplasty ten years ago, with increasing pain, instability, with following episode of spraining the knee had been brought to hospital. Radiological findings showed fracture and malposition of femoral component, fracture of medial femoral condyle, malposition of tibial component.

70 y.o., female had previously undergone revision knee arthroplasty three years ago, had been brought to hospital with pain, instability after spraining the left knee joint three months ago. Radiological findings showed fracture of hinge type implant fracture.

In both cases revision knee replacement was done with hinge type implant, using additional trabecular metal and stems. In follow-up both patients was walking with good range of motion, x-rays showed no loosening of implants.

In conclusion, complex knee replacements require understanding of the bone defect classification, biomechanics, loading forces. Preoperative planning needs to be done with CT scans, long-leg standing x-rays for digital planning. Additional augments, sleeves, cones, stems must be used to achieve good contact with bone and stable fixation for implant survivorship to increase.

INDICATORS OF SUCCESSFUL JUMPING ABILITY POST-ACL RECONSTRUCTION

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Objectives. Anterior cruciate ligament injuries are common in sports. Because of the long rehabilitation, it is important to research functional tests that indicate patient's ability to jump. The aim of the study was to evaluate the functional differences between patients with the ability to perform jump tests versus patients without the ability to perform jump tests after ACL reconstruction.

Materials and Methods. This quantitative, analytic prospective study was conducted from September 2018 to December 2022. 46 male patients who underwent ACL reconstruction were divided into two groups: 23 (jumpers) with ability to jump and 23 (non-jumpers) unable to jump. Functional testing included data about age, medical history, the operation, and tests such as the knee outcome survey activities of daily living scale (KOS ADLS), hamstring (H) and quadriceps(Q) submaximal strength, jumping tests and Y-balance test. The collected data were analyzed using SPSS 23.

Results. There was no statistical significant difference between the two groups in age, body mass index (BMI), and time after the operation, H/Q strength ratio ($P > 0.05$). Jumpers group mean age 27.2 ± 2.3 years, BMI 23.5 ± 0.4 , 240.9 ± 16 days after the operation, operated leg H/Q strength ratio $86.6 \pm 6.9\%$ and non-operated $84.3 \pm 4.8\%$. Non-jumpers group mean age 28.4 ± 2.5 years, BMI 25.1 ± 0.6 , 233.7 ± 21 days after the operation, operated leg H/Q strength ratio $85.6 \pm 7.7\%$ and non-operated $79.2 \pm 5.9\%$. Statistical significant difference between the groups in the Y-balance test anterior reach for operated leg 67.9 ± 1.6 cm, non-operated leg 70.1 ± 2.2 cm versus non-jumpers group 59.8 ± 0.9 cm and non-operated leg 63.7 ± 1.1 cm and KOS ADLS results between the groups jumpers $95.2 \pm 0.8\%$ versus non-jumpers $88.3 \pm 3.4\%$ ($P < 0.05$).

Conclusions. The functional testing, such as the KOS ADLS and Y-balance test, may be useful indicators for jumping ability for patients with ACL reconstruction. Further research is needed, including the inclusion of female patients and follow-up studies.

INTRAOPERATIVE STEP-BY-STEP ACHIEVEMENT OF SOFT TISSUE BALANCE DURING PRIMARY TOTAL KNEE REPLACEMENT

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Objectives. Achieving soft tissue balance by identifying and step-by-step elimination of defects for kinematically correct primary total knee replacement (TKR).

Materials and Methods. This prospective study was conducted in a Multidisciplinary clinic of the Tashkent Medical Academy from November 2018 to November 2022. 47 unilateral TKRs were performed in patients with a diagnosis of primary knee joint osteoarthritis of III-IV degree (Kellgren-Lawrence, 1978). Among them, 20 men and 27 women, whose average age is 62.1 ± 7.1 years. Assessment of the balance of soft tissues during TKR was performed intraoperatively to assess the intervals of extension and flexion with varus and valgus stresses. Also evaluated: the time of the operation, the range of movements (ROM), the pain syndrome - Visual analogue score (VAS) (at rest and under stress).

Results. The average HKA value was $9^\circ \pm 5^\circ$, and the maximum varus voltage measured intraoperatively was $12^\circ \pm 4^\circ$. The average DFA, Parent Committee and IAA were $88^\circ \pm 2.5^\circ$, $84^\circ \pm 3.4^\circ$, and $4.5^\circ \pm 2.5^\circ$ respectively. If HKA was $< 10^\circ$, the deformation was amenable to correction in (40/47) 85% of cases. There is a positive correlation between HKA and the maximum varus voltage obtained intraoperatively ($r = 0.75$, $p < 0.0001$). IAA correlated with an increase in HKA ($r = 0.80$, $p < 0.0001$). The average ROM was $112^\circ \pm 12.5^\circ$. The operation time is 115 ± 22.7 minutes. VAS decreased in the early postoperative period to 2 at rest, to 3.5 at load.

Conclusions. Our research showed the effectiveness of step-by-step elimination of soft tissue balance defects in 85% of cases, at the same time, patient satisfaction was not evaluated. The correct balance of soft tissues ensures alignment of the joint axis during flexion and extension and, therefore, is the most important factor in the durability of the implant.

LATVIA WOMEN'S NATIONAL FOOTBALL TEAM HEALTH AND MOVEMENT PATTERN ANALYSIS

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Objectives. Football is played by 250 million players from more than 200 countries, both amateur and professional. As more women participate in football in Latvia, it is important to evaluate and analyse their health status and movement pattern to reduce the risk of cardiovascular diseases and injuries to ensure that athletes can perform at their best.

Materials and Methods. Prospective study was performed at the Sports Laboratory– FIMS Collaborating Centre of Sports Medicine, April 2022. The study was approved by the Ethics Committee of LSMA. After collecting information from athletes about demographic data, medical history, complaints, training program, cardiopulmonary exercise testing and running technique analysis were performed. Data was analysed using IBM SPSS29, p-values < 0.05 were considered statistically significant.

Results. The study included 24 female football players, divided into two age groups: adolescents between 14 and 17 years of age (n = 11) and adults between 18 and 23 years of age (n = 13). There was no statistically significant association between the groups in terms of age, BMI, training program, number of years playing football, complaints, exercise heart rate increase, post-exercise recovery, blood (except lactate) and urine analysis. Statistical differences between groups were found in the maximum running speed achieved during cardiopulmonary exercise testing – adolescent group reached 11.54 ± 1.2 km/h and adult group 13.32 ± 1.1 km/h; adolescent group achieved maximal oxygen uptake (VO₂max) 39.97 ± 4.3 mL/min/kg and adult group 46.14 ± 10.1 mL/min/kg; the post-test blood lactate of the adolescent group $1.54[1.15;2.39]$ mmol/L and adult group $1.15[0.76;1.41]$ mmol/L, 90% of the adult athletes were heel strikers, while in the adolescent group it was 58.3%.

Conclusions. Adult athletes had higher physical working capacity, VO₂max, lower blood lactate level and were more likely to be heel strikers than adolescent athletes. Further research is necessary to better understand health status and movement pattern and provide preventive measures that are essential to improve performance on the football field.

METABOLIC FLEXIBILITY AND LACTATE PROFILE IN MAXIMAL TREADMILL EXERCISE TESTING IN FEMALE ATHLETES

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Objectives. Fat and carbohydrate metabolism is largely dependent on mitochondrial density and function. Ability to change and adapt substrate usage in rest and during exercise is known as metabolic flexibility. Objective of this study was to retrospectively analyse lactate profile and substrate (fat and carbohydrate) oxidation and determine metabolic flexibility during maximal incremental treadmill exercise testing as indirect measures of mitochondrial function in female athletes with different oxidative capacity.

Materials and Methods. In retrospective study results from the Latvian Olympic Unit Physical Exercise Testing Laboratory were analysed. 201 female who did maximal incremental cardiopulmonary exercise test (CPX) on treadmill were included (18–54 years old), and divided in three groups based on their maximal oxygen consumption ($\text{VO}_{2\text{max}}$): “poor” ($< 36 \text{ mL/min/kg}$; $N = 22$), “average” ($36\text{--}49 \text{ mL/min/kg}$; $N = 143$), “good” ($> 50 \text{ mL/min/kg}$; $N = 36$). Carbohydrate and fat oxidation (CHOox and FATox) rates were calculated and maximal FATox as well as lactate profiles were analysed.

Results. The mean age of “good”, “average” and “poor” groups were 32 ± 7 , 34 ± 8 and 37 ± 6 years respectively. Maximal FATox was significantly higher in “good” group compared to “average” and “poor” group individuals (0.45 g/min at 9.8 km/h ; 0.43 g/min at 7.4 km/h and 0.42 g/min at 6.9 km/h respectively). FATox declined till 0 g/min at 10.4 km/h and average blood lactate concentration at this speed was 4.8 mmol/L in “poor” group while in “average” group it was at 13.4 km/h and 4.7 mmol/L . Participants of “good” group showed FATox above 0 g/min until the end of the CPX test despite remarkably high blood lactate concentration.

Conclusions. In conclusion CPX testing can be useful for indirect evaluation of mitochondrial function. Well trained females show higher metabolic flexibility compared to less fit individuals. Blood lactate can be used to determine substrate utilisation in female athletes.

MID-TERM OUTCOMES AFTER SURGICAL TREATMENT OF FRACTURES AROUND TIBIAL PLATEAU

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Objectives. Fractures around the tibial plateau affect one of the most critical load-bearing areas of the human body, therefore diagnostics and preoperative planning according to modern concepts are crucial for the long-term outcome of this fracture type. The objective of the study was to evaluate the surgical treatment outcomes of patients with tibial plateau fractures.

Materials and Methods. A retrospective study of 108 patients with proximal tibial fractures, admitted to the Hospital of Traumatology and Orthopaedics from 2018 to 2021, was conducted. In the study, 88 patients (81.5%) with surgically treated fractures were included. Radiographs and computed tomography scans were evaluated and fractures were classified according to AO/OTA classification. The first group (group A) included patients with type A and B fractures; the second group (group B) – had type C fractures. The surgical approaches and fixation types were evaluated. For functional outcome evaluation, Lower Extremity Functional Scale (LEFS) was used.

Results. Fifty-five patients underwent plate, 19 – plate and screw fixation, from those only one surgery had arthroscopic assistance; 14 – screw fixation and 11 of those operations had arthroscopic control.

Functional outcome was evaluated in 45 patients (51.1%) 11 – 43 months after surgery. Group A (25 patients, mean age 51.8 years) had a mean LEFS score of 57.46 ± 3.1 SD and group B (20 patients, mean age 56.2 years) had a mean LEFS score of 48.1 ± 3.57 , $p = 0.054$.

Conclusions. There are no statistically significant differences between mid-term outcomes in patients with articular fractures compared to patients who have had extra-articular or partial articular tibial plateau fractures. Further research is required.

NEURAL THERAPY AND ITS USE IN POST-COVID PATIENTS WITH VERIFICATION OF HEART RATE VARIABILITY

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Objectives. The effect of neural therapy and respiratory physiotherapy in post-COVID patients after artificial lung ventilation and after oxygen therapy with an oxygen mask with verification of heart rate variability in three positions.

Materials and Methods. Effect The case study is the case studies of two post-COVID patients, where the first is a 57-year-old female patient after hospital treatment with oxygen therapy using an oxygen mask, and the second patient is a 54-year-old man after artificial lung ventilation. Before treatment, heart rate variability was tested on both patients using the VarCor 7 device. As part of physiotherapy, the patients completed diaphragmatic breathing exercises in both horizontal and vertical positions, also using consonants during static, dynamic and mobilization respiratory gymnastics. Subsequently, a local anesthetic – Marcain 2 mL was applied once to each source of irritation according to the Neural Therapy according to the pulmonary composition and to the appendiceal point. The therapeutic intention was subsequently verified by examining the variability of the heart rate after the monthly rehabilitation treatment.

Results. Effect By examining and verifying the patient's dysfunction before and after the therapeutic intervention, permanent changes are recorded in terms of the activity of the respiratory system as well as the autonomic nervous system.

Conclusions. Neural therapy as one of the methods of reflexology has its justification in rehabilitation both in the diagnosis of the trigger mechanism and in influencing the vegetative nervous system.

ONLINE AEROBIC ADAPTED PHYSICAL ACTIVITIES FOR IMPROVING FUNCTIONING AND QUALITY OF LIFE IN PERSONS WITH CHRONIC STROKE

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Objectives. Inactivity adversely affects cardiovascular health and may increase the risk of recurrent stroke. The aim of the study was to evaluate the impact of online aerobic adapted physical activity sessions (OA-APA) on the physical health and quality of life parameters in persons with chronic stroke. In addition, the heart rate of participants was compared between the supervised and unsupervised sessions.

Materials and Methods. The three participants with chronic stroke (all females, age 51–71 years) participated in the multiple baseline single subject design study. The OA-APA intervention was conducted for 4 months, 3 times per week, divided in two phases: (A) supervised sessions together with the therapist, and (B) unsupervised sessions with participants following the recorded video. A two weeks of phase A followed by two weeks of phase B (eight cycles in total). Heart rate intensity was monitored with Polar H10 connected to Polar Flow app. All participants performed 6MWT, Berg Balance Scale, and completed SF-36, IPAQ surveys.

Results. Visual analyses presented predictable and stable HR intensity in all three participants throughout the study. The adherence rate in the study was 81–89% across the A and B phase. Participants successfully followed the recommended exercise intensity 55–80% Max HR during both exercise online modes – under the supervision of a specialist and exercising independently. The OA-APA intervention significantly improved the 6MWT results ($6MWT_{baseline} = 100 - 200m$ to $6MWT_{post} = 211 - 464m$), level of physical activity (IPAQ from avg 2258 MET/min/week to 3547 MET/min/week), while SF-36 outcomes did not change.

Conclusions. The OA-APA intervention as easy to perform and applicable for persons with chronic stroke. The results partially support hypotheses that OA-APA improves physical fitness outcomes and level physical activity in persons with chronic stroke.

OUTCOMES OF SIMULTANEOUS BILATERAL TOTAL HIP ARTHROPLASTY – SINGLE SURGEON EXPERIENCE

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Objectives. Simultaneous bilateral total hip arthroplasty (SimBTHA) allows one to replace both hips under one anaesthetic. SimBTHA has been reported to result in fewer complications, reduced costs, and shorter overall hospital stay and rehabilitation time. The purpose of this study was to characterize a cohort of patients selected for SimBTHA.

Materials and Methods. A total of 55 patients who underwent SimBTHA surgery between 1996 and 2020 at the Hospital of Traumatology and Orthopaedics in Rīga, Latvia were included in the study. Both hips were replaced using the direct anterior approach with the patient lying supine. Data from medical records, such as intraoperative parameters and complications, and clinical results at follow-up visits were analyzed. IBM SPSS 27.0 was used to analyze the data.

Results. Most of the patients who underwent SimBTHA had ASA II (63.2%, n = 12) and also had some comorbidity (60%, n = 33). The surgery was completed in an average of 2 hours and 39 minutes. The average length of hospital stay was 14.7 days. The patients were able to walk independently with crutches at 5.6 days (± 3.5) after surgery. The overall frequency of complications was 7.3% (n = 4); all were detected and corrected in the early postoperative period. The mean Harris Hip Score was 95.76 points, indicating an excellent result.

Conclusions. SimBTHA is a successful procedure in terms of clinical outcomes. Future research would be needed to conduct more comprehensive research comparing SimBTHA with staged bilateral total hip arthroplasty.

PECULIARITIES OF YOUNG WELL-TRAINED ADOLESCENT FEMALE VOLLEYBALL PLAYERS' SHOULDER GIRDLE

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Objectives. The objective of our study was to evaluate shoulder joints' ROM, peak isometric strength of arms muscles, submaximal force repetition error, upper body dynamic stability, and correlations among these characteristics in well-trained female volleyball players.

Materials and Methods. 15 young well-trained female volleyball players from Murjani sports gymnasium participated. The shoulder active ROM in internal rotation (IR), external rotation (ER), flexion, extension, abduction, adduction, horizontal abduction (HABD), and adduction (HADD) were measured using a goniometer. The peak force and the ability to repeat the submaximal force of IR, ER, and extension muscles were determined in isometric contractions using a handheld dynamometer in a vertical position on volleyball players. Dynamic stability was determined by the Y-upper-body dynamic balance test (YUBDST).

Results. The ER ROM ($97^\circ \pm 12^\circ$ in the dominant D, $95^\circ \pm 10^\circ$ in the nondominant N shoulder) was increased. The IR ($54^\circ \pm 12^\circ$ D and $62^\circ \pm 8^\circ$ N) and HADD ($34^\circ \pm 8^\circ$ D and $35^\circ \pm 10^\circ$ N) ROMs were decreased. The extension and adduction ROMs were smaller in the D shoulder ($p < 0.05$). The D arm's IR, ER, and extension muscles developed greater peak forces ($p < 0.05$). ER/IR muscles' peak forces ratio was 0.93 on both shoulders. The D arm's extensor and ER muscles' submaximal force repetition error was smaller ($p < 0.05$). YUBDST mean normalized reaching distances were $95 \pm 6\%$ in the D and $94 \pm 7\%$ in the N arm, symmetrical on both sides. The correlations between the shoulder rotators' peak force and the YUBDBT result were not significant.

Conclusions. Regular repetition of volleyball spikes led to an increase in ER, a decrease in IR and HADD ROMs, and muscle strength and its differentiation ability growth, especially in the D arm. The action of shoulder ER and IR muscles was balanced. The upper body dynamic stability was the norm and did not depend on the rotator muscles' strength.

PENETRATION OF PROPHYLACTIC CEPHAZOLIN IN LUMBAR INTERVERTEBRAL DISC DURING MICRODISCECTOMY

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Objectives. Spondylodiscitis is a rare complication of microdiscectomy procedure in spine surgery with an incidence of 3–4%. Objective of this study was to measure levels of cephazolin in the intervertebral disc during microdiscectomy and determine if they reach the stated minimum inhibitory concentration against *Staphylococcus spp.* (4 mg/L) following intravenous administration.

Materials and Methods. A total of 40 patients, including 21 males and 19 females, with a median age 41 years (range 36–50), received 2 g intravenous cephazolin before 1 or 2-level lumbar microdiscectomy. Venous blood was collected before administration of cephazolin and again at disc removal. Blood and intervertebral disc tissue was assayed by high performance liquid chromatography to measure cephazolin concentrations.

Results. The interval between cephazolin administration and tissue sampling ranged from 25 to 93 minutes. All of the disc samples had detectable levels of cephazolin at the time the disc was removed. Cephazolin concentration in the serum (range 85–206 mg/L) was higher than in the disc (range 3.1–26.3 mg/L). Two of the samples had cephazolin levels lower than 4 mg/L, and 8 samples had levels lower than 8 mg/L. Serum cephazolin concentration did not relate to disc concentration at a given time or the time from cephazolin administration.

Conclusions. Cephazolin diffuses into the human disc in detectable concentrations. The concentration of the antibiotic exceeded the minimum inhibitory concentration in the disc tissue against most susceptible bacteria during the period between 30 and 90 minutes in 95% of patients.

PERIODISATION AND HIGH INTENSITY INTERVAL TRAINING IN ENDURANCE SPORTS: REVIEW

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Objectives. To assess current scientific literature on periodisation and high intensity interval training (HIIT). To discover modern and scientifically solid ways to implement HIIT in training process.

To present a coherent and practical way to execute HIIT during a specific training cycle.

Materials and Methods. Scientific databases Web of science, Pubmed and Scopus were searched for keywords “High intensity interval training” and “periodisation”.

Of articles found only those looking at interconnection of training plan and HIIT, performed on healthy endurance athletes were included in this research.

Results. Initially after searching for keywords “High intensity interval training” and “periodisation” more than 4000 articles were found. Of those 6 were selected for this research.

Around 2010s we see sufficient evidence to question classical periodisation. Issurin in his PhD thesis shows higher efficiency when block periodisation is used. A 12-week study of amateur cyclists in 2016 suggest no need for periodisation. And in 2019 a case report of most successful female cross country skier further approves this notion. It is polarisation instead.

In 2009, Seiler and colleagues showed polarisation as an effective method for endurance training. Zone 5 training is cornerstone of polarisation. HIIT is performed in zone 5. As defined by American College of Sports medicine in 2014, HIIT lasts from 5 s to 5 min and is performed at intensity of 80–95% of maximum heart rate.

Today most extensive meta analysis of HIIT was done by Wen and colleagues in 2019. It showed that longer HIIT and with larger total volume are more effective for increasing Vo₂ max, which is one of more important predictors of endurance performance.

Conclusions. Polarisation is taking over endurance training and periodisation is losing its importance. HIIT is cornerstone of polarisation.

As there are a lot of HIIT protocols, the best is yet to be determined.

PERSONALISED SPORTS MEDICINE AND SPORTS TO LIVE LONG AND HEALTHY

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Objectives. The number of competing athletes arises, but participants' health condition, fitness and performance level are different. However, according to the most recent recommendations, safe participation should include athlete screening and prevention of the exercise-caused increased risk. Modern processing of personal and sensitive data in medicine, knowledge of the patient's unique risk profile, early use of diagnostic and in-depth screening methods in sports medicine and the development of information technologies provide an opportunity for athletes in all sport levels and patients with different diseases and injuries to ensure individualized physical activity, definitive physical load, kind of sport, necessary changes in training program and therapy to achieve successful health outcome.

A longitudinal prospective study was performed at the Sports Laboratory, FIMS Collaborating Centre of Sports Medicine with the goal to evaluate individualized approaches to improve the health risk factors detection and prevention, estimating individual exercise responsiveness and its variability and developing the clinical relevance in the sports medicine studies. Anthropometry, training program analysis, cardiopulmonary exercise testing, and data statistical analysis were used to analyse 1050 male and 550 female 12- to 70-year-old competing athletes. RSU Research Ethics Committee approval.

The cardiorespiratory system's functionality, aerobic and anaerobic ability, and exercise tolerance were all impacted by the exercise consultation, in addition to gender, age, and the nature of the training program. People's training regularity, duration, and reliance on a sports coach decreased as they aged.

The personalized sports medicine principles for planning of physical activity, individualized physical load dosing improve an individual's health and avoid the potential risks. To achieve this goal, athletes at all sports levels should be monitored regularly for in-depth preventive medical screenings in sports medicine, including cardiopulmonary exercise testing.

Keywords: Sports medicine, Exercise medicine, Personalized medicine, Exercise consultation, Exercise tolerance, Cardiopulmonary exercise testing.

PRELIMINARY RESULTS OF SACROPLASTY SURGERY IN ELDERLY PATIENTS IN CASES OF ACUTE TRAUMATIC FRACTURE OF LATERAL MASS OF THE SACRUM

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Objectives. Traumatic fractures of the sacrum occur in the population in 2.1 cases per 100,000 people, at the same time, their frequency increases dramatically in elderly people, reaching 1–5% in case of trauma. In the Liepāja Regional Hospital, from September 2021 to December 2022, 7 sacroplasty operations were performed on patients with a traumatic fracture of the lateral mass of the sacrum combined with a fracture of the os pubis (referring to AO classification cods 61B). The operation allows early mobilization of such patients, shortening the treatment time.

Materials and Methods. The study includes patients over 50 years of age and trauma no older than 2 weeks. The examination protocol includes a pelvic X-ray, CT scan and functional examinations of the patient.

Results. The patients are seven women aged 61–84 years, average 75 years. Before the operation, the pain intensity according to the pain scale was on average 7.9, after the operation it decreased on the pain scale to an average of 3.9.

Conclusions. Clinical results show that pain after saroplasty decreases and the patient's mobility increases. X-rays of the pelvis often do not show sacrum fractures, so a CT scan should be used to diagnose the fracture.

PROPRIOCEPTION IN PATIENTS WITH PATELLOFEMORAL PAIN SYNDROME – COMPARING THE EFFECT OF CLOSED AND OPENED KINETIC CHAIN EXERCISES

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Objectives. The ability to sense the position and movement of the knee joint plays an important role in the diagnostics and rehabilitation of a patient with patellofemoral pain syndrome. Proprioception and the measurement of joint position sense (JPS) have so far received so little attention within the patellofemoral research literature. Our aim was to compare the effectiveness of rehabilitation programs using opened and closed kinematic chain exercises in patients with patellofemoral syndrome and proprioceptive dysfunction.

Materials and Methods. Our research sample consisted of 45 patients (27 female, 18 male) with a mean age of 23.6 years, mean height of 1.73 m, mean weight of 69.8 kg, and a mean BMI of 23.04. The patients were randomly divided into two groups. The first group completed a rehabilitation program using exercises in an open kinematic chain, the second group completed a rehabilitation program using exercises in a closed kinematic chain. Both groups completed a rehabilitation program for 8 weeks. Therapies took place 3 times a week for 30 minutes. For the examination, we used the non-weight-bearing knee joint position sense test in the sitting position measuring the differences from 20° and 60° target angles. Both groups were compared before and after the therapy using a statistical paired t-test.

Results. The results showed that there was no statistically significant difference between the start and the end after 8 weeks of the therapy in either of these groups. Target angle = 20°: CKC group $p > 0.05$, OKC group $p > 0.05$. Target angle = 60°: CKC group $p > 0.05$, OKC group $p > 0.05$. The highest mean absolute error (6.41) was found in the CKC group before the therapy (target angle = 60°).

Conclusions. After 8 weeks of physiotherapy, we did not find improvement in proprioception in patients with patellofemoral pain syndrome.

SPORTS-RELATED INJURIES IN ADOLESCENT ATHLETES

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Objectives. Adolescents play according to the rules of adults and the apparatuses are not adjusted to their sizes, maturity, motor and functional adaptation. Understanding sports related injuries in adolescent athletes can lead to the implementation of injury-prevention strategies.

The aim of the study is to evaluate the findings of sports related injuries in adolescent athletes published in the international journals selected from the databases according to pre-defined criteria.

Materials and Methods. This study is a review of research articles devoted to sports related injuries in adolescents. A literature search using key terms sports injuries, epidemiology, injury rate, adolescent athletes extracted 1307 citations from *PubMed*, *Science Direct*, *Scopus* and *Clinical Key* databases out of which 354 relevant open access full-text articles were extracted and looked through. Four articles that fulfilled the inclusion and exclusion criteria were selected.

Results. The total number of the subjects of the selected studies comprises 4932 respondents aged from 12 to 21. Three of the articles show that the highest percentage of injuries were in the lower body. Ankle injuries comprise from 20.0% to 36.1%; knee from 15.7% to 19.3%. Muscle strains (from 7.8% to 33.7%), ligament sprains (from 8.5% to 26.0%), and bone fractures (from 7.8% to 16.0%) were reported as the most common injuries. The applied measurement systems of injury rates differ across the publications; therefore they could not be analysed all together.

Conclusions. The results show that most commonly injuries occur in the lower body – ankle and knees – resulting in muscle strains, ligament sprains, and bone fractures. Ankle injuries were the most common. These findings point out the need for a registration system of sports related injuries in Latvia to compile and analyse data for the prevention of sports related injuries in adolescent athletes.

STUDY OF SPEECH, LANGUAGE AND HEARING IN CHILDREN WITH CLEFT LIP

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Objectives. To examine the prevalence of speech, language, orofacial myofunctional disorders, hearing and bite problems in children with cleft lip diagnosis.

In the case of cleft lip, information on the effects of cleft lip on speech, language and hearing is controversial. Some studies show a higher prevalence of speech, language and hearing impairment. However, other studies do not support the association of speech, language and hearing disorders with cleft lip.

Materials and Methods. Retrospective chart review of 68 patients with cleft lip (born between 2008 to 2017 and reached the age of 5 years at the time of the study) were analysed. Data was analysed descriptively.

Results. 63 patients were identified with diagnosis Q36.9, 3 patients were identified with diagnosis Q36.0. 36 patients had cleft lip combined with an alveolar cleft. The average age when the cleft lip repair was performed was 5.1 months. Osteoplasty for alveolar cleft closure was performed on 22 patients. Hypernasality and nasal air emission was not observed in any patient. 27% of patients had orofacial myofunctional disorder. Language disorder was documented in 22% of the patients and speech sound disorder unrelated to the cleft lip was documented in 54% patients. Overall, 59% of children with cleft lip had speech and language disorders (32% of children are at risk of language disorders in the overall population). Five patients required orthodontic treatment. Only 7 patients required a hearing test, and all patients had an age-appropriate hearing function.

Conclusions. 59% children with cleft lip had speech and language disorders, which were not related to the cleft lip. In order to draw conclusions about the hearing function, more attention should be paid to testing the hearing function.

THE HIDDEN INJURY – POSTERIOR MALLEOLUS FRACTURES IN COMBINATION WITH TIBIAL DIAPHYSEAL FRACTURES

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Objectives. To determine the frequency of diagnosed and unrecognized posterior malleolus fractures in patients with tibial diaphyseal fractures and their impact on further treatment outcomes.

Materials and Methods. 115 patients with diaphyseal tibial fractures hospitalized in a single medical center from year 2020 to 2021 were included in the retrospective study. Patient demographic data, trauma mechanism, posterior malleolus fracture frequency, size, displacement, treatment methods, radiographic signs of fracture consolidation, and ankle joint osteoarthritis were analyzed by using the Impax-Orthopaedic-Tools 3.0.2.3 and IBM SPSS 23 program.

Results. The most common trauma mechanism was a twisting injury and falling from one's height (67%). Accompanying posterior malleolus fractures were present in 39% of all cases. While patients with posterior malleolus involvement had 93% spiral diaphyseal tibial fractures, the difference between patients without posterior malleolus fractures was not significant ($p = 0.091$). Diaphyseal fractures localized in the distal third of tibia were significantly more prevalent in the posterior malleolus group (83% vs 100%, $p = 0.026$). While fibular fractures were present in all posterior malleolus patients, the difference was not significant ($p = 0.076$). CT scan of the lower leg was done in 12% of all cases, increasing the count of diagnosed posterior malleolus fractures by 4%. In seven cases the posterior malleolus fracture was detected only in postoperative radiographs, one of these patients had the fracture additionally fixated with screws. Posterior malleolus was surgically fixated in 73% of cases. Signs of ankle joint osteoarthritis (stage 1) after one year were significantly more common in the posterior malleolus group ($p = 0.039$).

Conclusions. A patient with a rotational injury sustaining a spiral distal third tibia fracture with a fibula fracture has an increased risk of posterior malleolus fracture. Ankle joint CT scan should be indicated in such cases. By identifying concomitant posterior malleolus fractures, the surgeon can develop an adequate treatment plan to achieve a satisfactory outcome.

TREATMENT OF MULTIPLE FOOT, ANKLE AND HAND BONE AND SOFT TISSUE DEFECTS ACQUIRED BY MILITARY EXPLOSION TRAUMA: CASE REPORT

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Objectives. A 36-year-old man had an explosive trauma on battlefield. Multiple regions were injured, the most affected region was lateral side of left foot and ankle with extensive soft tissue and bone defect. Patient was transferred to RAKUS “Gailezers” for reconstruction treatment of bone and soft tissue defects.

First, we made debridement of the left hand thenar zone with fistula closure, left foot defect debridement, subtalar joint arthrodesis with wire and ex-fix, bone defect was filled with PMMA with antibiotics and wound closure with NPWT dressing. For the definitive closure of lateral foot and ankle soft tissue defect rotated peroneus brevis flap was used. Multiresistant *K. Pneumoniae* was presented in microbiology, because of that target oriented antibiotic therapy was started.

After regular dressing distal necrosis of flap was seen. We decided to make debridement of the necrosis, that proved to be superficial, and further autodermoplasty, flap was covered by NPWT dressing. Flap and autodermoplasty healed properly. Ex-fix and wire evacuation were made after healing of subtalar joint arthrodesis. After patient was admitted for further rehabilitation to RAKUS “Bīķernieki”.

After 2 month third stage surgery was done for lateral ankle instability. We made ankle joint arthrodesis with 3.5 mm reconstruction plates and 6.5mm screw, with iliac crest bone autograft. Ankle joint was fixed with plaster cast for post-op immobilization. After surgery patient continued further rehabilitation.

Conclusion:

1. Explosive trauma produces unique patterns of injury that always complicate by infection.
2. Treatment of explosive trauma requires step by step multiple operative interventions.
3. Correct and aggressive debridement and target directed antibiotic therapy is the main treatment in posttraumatic infection.
4. Definitive osteosynthesis isn't advised as the first line treatment in case of explosion military trauma.

USE OF THE DIGITAL ASSISTANT “VIGO” AT HOME ENVIRONMENT FOR STROKE RECOVERY: FOCUS GROUP DISCUSSION WITH SPECIALISTS WORKING IN NEUROREHABILITATION

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Objectives. The aim of this study is to identify the requirements for a tablet-based home program for stroke recovery from a specialist working in stroke rehabilitation perspective.

Materials and Methods. A qualitative exploratory study was conducted to identify the eligibility requirements of the tablet-based home rehabilitation program Vigo for stroke recovery from a specialist perspective. The main interest of concern was a better understanding of specialists' attitudes, experience and expectations about the use of the digital assistant “Vigo” as home-based rehabilitation program for stroke recovery in domains of application's functionality, compliance, usability and content.

Results. In total 17 healthcare professionals (physiotherapists, occupational therapists, speech and language therapists and physical medicine and rehabilitation physician) participated in three focus group discussions. Four main themes were identified: 1) clinician's views on using Vigo as a home-based rehabilitation system, 2) patient related circumstances facilitating and limiting the use of Vigo, 3) Vigo application functionality and its use process (programme creation, individual use, remote support), 4) complementary and alternative Vigo use perspectives. Last three themes were divided totally in 10 subthemes and two of those subthemes had two sub-subthemes each.

Conclusions. Healthcare professionals expressed a positive attitude towards the usability of the application, but acknowledged the application is still a work in progress to show any improvements in patient functional outcomes. Coherency is needed between the aim of the application and the description defined by the developers to use the application according to its intended goal. To have a therapeutic effect, close involvement of rehabilitation specialists is needed in the process of the development of the application and research process.

COLORECTAL CANCER LIVER METASTASES EVALUATION AFTER TACE TREATMENT BASED ON RECIST 1.1 AND SUM OF DIAMETERS

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Keywords. Transarterial chemoembolization; Liver metastases; Colorectal cancer; Interventional radiology.

Objectives. Liver metastases are the leading cause of death in colorectal cancer patients. The aim of this study was to investigate the effect of TACE with irinotecan or doxorubicin loaded spheres in patients with liver metastases from colorectal cancer.

Materials and Methods. In total 32 patients (14 female, 18 male) were included and received 93 TACE sessions, on average 2.90 ± 1.84 interventions per patient. 9 patients had 1 metastasis, 2 patients – 2 metastases and 21 patients – 3 or more metastases. Pre- and posttreatment MRI and CT images were analyzed retrospectively. The metastases were measured based on RECIST 1.1 criteria (sum of the longest diameters), and divided in the following categories – partial response (PR, decrease by 30%), progressive disease (PD, increase by 20%), stable disease (SD), early death. The metastases were measured also in CC, LL and PA projections and the same criteria for the response was applied. The mean values, median, standard deviation, maximum and minimum values were determined. The follow-up imaging was conducted after approximately 2.8 months.

Results. Based on RECIST 1.1 criteria following results were observed:

PR in 1/32 (3.1%), SD in 15/32 (46.9%), PD in 14/32 (43.8%), Early death in 2/32 (6.3%).

After evaluating metastases in all 3 projections and comparing the outcome with RECIST 1.1, results showed slight differences – PR in 3/32 (9.4%), SD in 17/32 (53.1%), PD in 10/32 (31.3%).

Conclusions. Current data demonstrates that TACE with doxorubicin and irinotecan-loaded beads is a safe and reliable procedure for selected patients. Based on our data it is partially effective, but caution should be used when assessing only size of metastases. Other relevant assessment criteria also should be taken into account (i.e. contrast media uptake, cystic degeneration of MTS, diffusion restriction on MRI etc.).

SPINAL DURAL ARTERIOVENOUS FISTULA- RADIOLOGICAL DIAGNOSIS, CLINICAL FINDINGS AND ENDOVASCULAR TREATMENT

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Keywords. Spinal dural arteriovenous fistula (SDAVF); Endovascular embolization; Myelopathy

Objectives. SDAVF is an arteriovenous shunt formed by dural vessels. It leads to arterialization and reversal flow into venous system of the spinal cord thus promoting venous congestion and intramedullary edema leading to progressive myelopathy and disability. Patients undergo either endovascular or surgical therapy. Treatment response and data about success rates are variable. The aim of this study was to review clinical findings, diagnostic and therapy results of SDAVF in Latvia.

Materials and Methods. Retrospective study of 10 patient data who were diagnosed with SDAVF and underwent endovascular therapy in Pauls Stradins University Hospital from May 2013 till December 2022. Imaging data was used to define the extent of pathological changes secondary to the fistula. Patient functional status and embolization data were evaluated from medical records. One patient lacked clinical and imaging evidence. Statistics was performed using IBM SPSS.

Results. Patients with SDAVF were males 6(60%) and females 4(40%), with mean age 56.6 ± 13.8 . Most common location of fistula was Th6-L2 region (60%; $n = 6$). The extent of spinal cord T2 hyperintensity and flow voids varied between 3–10 (mean 7.5 ± 2.51) and 1–17 (mean 5.78 ± 5.2) vertebral body levels respectively. Conus medullaris involvement was observed in 77.8% ($n = 7$). Most common clinical findings were extremity weakness (100%; $n = 9$), sensory disturbances (100%; $n = 9$), urination problems (77.8%; $n = 7$) and pain (55.6%; $n = 5$). Embolic agents used for endovascular treatment were PHIL ($n = 2$; 20%), Histoacryl&Lipiodol ($n = 3$; 30%) and Onyx ($n = 5$; 50%). Procedure was successful in 60% ($n = 6$), with Onyx showing the best results ($n = 4$; 80%), other patients undergone reembolization or open surgery. One patient had residual fistula. Radiological and clinical posttreatment improvement was observed in 66.7% ($n = 6$) and 55.6% ($n = 5$) respectively.

Conclusions. Study results resemble current literature data. Endovascular approach is successful and gives posttreatment improvement for majority of reviewed SDAVF cases. Further studies with a larger patient cohort are needed.

FUNCTIONAL OUTCOME OF PATIENTS AT MID-TERM FOLLOWING TIBIAL PLATEAU FRACTURES

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Keywords. Tibial plateau fracture; Functional outcome; Schatzker classification

Objectives. Surgical treatment of intra-articular tibial plateau fractures is challenging and outcomes can be associated with mid-term functional disturbances. The objective of this study was evaluation of mid-term outcome of patients with intra-articular tibial plateau fractures following surgical treatment.

Materials and Methods. Retrospective study of 108 patients with proximal tibia fractures, admitted to the Hospital of Traumatology and Orthopaedics from December of 2018 to December of 2021, was conducted. In the study 88 patients (81.5%) with surgically treated proximal tibia fractures were included. Injury mechanism, radiograph and computed tomography image was evaluated and fractures were classified according to Schatzker classification. In one group (group A) were included patients with fracture types I-IV, caused by low-energy trauma; in the other (group B) – fracture types V-VI, caused by high energy trauma. For the patient's functional outcome measurement Lower Extremity Functional Scale (LEFS) was used. The statistics were analysed using IBM SPSS v27.

Results. Functional outcome was evaluated in 45 patients (51.1%) 11–43 months after surgery. Group A (30 patients, mean age 54.4 years) had mean LEFS score 54.3 SD ± 17 and group B (15 patients, mean age 53.4 years) had mean LEFS score 52 SD ± 16.8. There were no statistically significant differences in the mean LEFS score between both groups, Mann-Whitney test, $U = 210.0$, $p = 0.718$.

Conclusions. The results of our research suggest that mid-term functional outcome in patients with type of tibial plateau fracture, caused by high-energy trauma according to Schatzker classification, seem to be worse, but without significant difference, compared with patients who have had fractures caused by low-energy trauma. Further studies on larger patients' groups will be needed.

DIFFERENCES IN MANAGEMENT AND MORTALITY RATE IN PATIENTS WITH MODERATE AND SEVERE TRAUMATIC BRAIN INJURY

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Keywords. Traumatic brain injury; Glasgow Coma Scale

Objectives. Traumatic brain injury (TBI) is a disruption in the normal function of the brain, and it occurs when a sudden trauma causes damage to the brain. The aim of this study was to investigate the difference in management and mortality rate in patients with moderate and severe TBI.

Materials and Methods. The retrospective observational study enrolled all 251 patients hospitalized at Riga East Clinical University Hospital in 2019, who were admitted with TBI. Patients were divided into moderate and severe TBI groups according to Glasgow coma scale (GCS) score. GCS scores 3–8 were classified as severe TBI and scores 9–12 were moderate TBI. Statistical analysis: SPSS 28.0 (descriptive statistics, Chi-square, Fisher's Exact, Mann Whitney-U test).

Results. In the study group moderate TBI was diagnosed in 11.2% (n = 28) and severe TBI in 13.5% (n = 34) subjects. Surgical intervention was required in 50% (n = 17) of patients with severe TBI while patients with moderate TBI received surgical treatment in 25% (n = 7) cases (p = 0.044). In 58.8% (n = 10) of patients with severe TBI preferred surgical intervention was craniotomy with hematoma evacuation while for patients with moderate TBI this technique was used in 42.9% (n = 3) cases and the same number of cases received craniotomy with hematoma evacuation and drain placement (42.9%, n = 3). The Mann-Whitney U test showed no statistically significant differences between need for blood transfusions (p = 0.585) hospitalization time (p = 0.190), time spent in intensive care unit (ICU) (p = 0.431) and extended need for assisted ventilation (p = 0.548) in the groups. Hospital mortality rate in patients with severe TBI was 41.2% (n = 14) but in patients with moderate TBI 7.1% (n = 2) (p = 0.002).

Conclusions. Patients with severe TBI more often require surgical intervention and more frequently experience hospital mortality. However, there was not enough evidence that patients with severe TBI more often needed blood transfusions, required longer hospitalization time, extended period in ICU or called for prolonged assisted ventilation.

ELECTRIC SCOOTER DRIVING-RELATED TRAUMA. CHARACTERISTICS OF PATIENTS AND INJURY CIRCUMSTANCES

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Keywords. Electric scooter; Emergency Department; Incidence

Objectives. The popularity of electric scooters (ES) has grown globally, mostly due to their convenience and environmental friendliness. The use of ES has been particularly boosted by the launch of rental points. Seeing the increasing number of trauma cases due to ES in Lithuania, this study aims to investigate the circumstances of trauma and other parameters.

Materials and Methods. We conducted a retrospective study evaluating patients that visited the emergency department (ED) of the Republican Vilnius University Hospital (RVUL) for injuries related to ES driving between 1 June and 31 August 2020. Registry data were analysed using independent samples T-test, Mann-Whitney U, Chi-square, Fisher's exact test and Spearman Rank Correlation tests.

Results. 196 patients met the inclusion criteria and were analysed. The mean age was 34 (18–69). 78.94% of patients were renting ES at the time of injury. 7.89% of all injured were intoxicated. Only 5.41% of patients were wearing a helmet. The most common cause of injury for 44.74% of the patients was falling off the ES while driving across uneven road surfaces. The most injured region was the upper limbs in 42.55% of patients, followed by 35.11% injuring lower limbs. Soft tissue trauma accounted for the most injuries (59.99% of cases). Helmet wearers typically visited ED for more serious trauma, bone fractures ($p = 0.021$). Drinking status did not show statistical significance in regard to trauma severity, head injury rates ($p > 0.05$).

Conclusions. Most ES driving-related injuries occur among young men, with falls of the ES while driving across uneven road surfaces being the leading cause of accidents. Both drunk and sober people are equally prone to suffer head injuries and bone fractures. Helmet wearers are less likely to suffer soft tissue injuries and therefore have fewer ED visits with a higher relative incidence of bone fractures.

VOLUMETRIC CHANGES OF ACOUSTIC NEURINOMAS AFTER SINGLE OR MULTIPLE FRACTION STEREOTACTIC SURGERY

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Keywords. Acoustic neurinoma; Stereotactic surgery; Tumour response.

Objectives. An acoustic neuroma, known as vestibular schwannoma, is a benign usually slow-growing tumor of the cranial nerve. Pseudoprogession is a well known phenomenon of temporary increase of lesion volume after radiosurgery. The aim of this study was to assess the presence of pseudoprogession in patients treated with single or multiple fraction stereotactic surgery.

Materials and Methods. Retrospective single-centre study included adult patients who had undergone stereotactic radiosurgery with Cyberknife M6 system in Sigulda Hospital Centre of Stereotactic Radiosurgery from 2015 through 2019. Volumetric analysis has been carried out with PrecisionTM (Accuray Inc., Sunnavyle, USA) software delineating tumour contours in every slice on consecutive MRIs.

Results. Out of 30 patients, 50% (n = 15) were male and 50% (n = 15) female. The mean age in the cohort was 54 years (SD ± 13). 70% (n = 21) of the patients received treatment with a single fraction (12–13Gy) dose, while 20% (n = 6) received 3 fractions (18Gy) and 10% (n = 3) received 5 (25Gy). The mean pre-treatment volume in the single fraction group was 0.78 cm³, averaging at 0.64 cm³ post-treatment, while the average pre-treatment volume in the multiple fractions group was 5.09 cm³, post-treatment being 2.39 cm³. In our study, 50% of the neurinomas regressed in volume, while 50% underwent pseudoprogession. Among patients who received single fraction treatment, 57% (n = 12) of the neurinomas shrunk in volume, while 43% (n = 9) pseudoprogessed. In the multiple fraction group, 33% (n = 3) regressed in volume, but 67% (n = 6) increased in size.

Conclusions. Pseudoprogession of the tumour should be anticipated and does not imply therapeutic failure. Further research is necessary to definitively conclude a clear pattern of changes in neurinoma volume in the respective groups.

THE DEVELOPMENT IN MANAGEMENT OF PILON FRACTURES

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Keywords. Traumatology; Distal tibia fractures; Pilon fracture; External fixation; Tibial plafond; Ankle fracture

Objectives. Pilon, or tibial plafond, fractures are one of the most difficult fractures to manage, because both soft tissue involvement and the comminuted fracture pattern pose challenges to fixation. The aim of our study was to investigate the evolution and current concept of pilon fracture management, comparing groups from 2006–2008 (group 1) 2009–2012 (group 2) and 2019–2021 (group 3) year time periods.

Materials and Methods. A total of 101 Pilon fracture patients were included in the study, where 27 patients were from group 1, 41 were from group 2 and 33 from group 3. Patients included were classified using AO/OTA classification, where pilon fractures are identified as extra-articular (43A), partial articular (43B), and intra-articular with subclassification (43C1, C2, C3). We recorded the fracture characteristics as trauma mechanism, open or closed fracture, as well as the operative management. Furthermore, the hospital stay and complications were noted. For statistical analysis, IBM SPSS Statistics was used.

Results. Gender, age distribution, trauma mechanism and AO/OTA classified fractures were not significantly different amongst the groups (p -value > 0.05), as well as type of external fixation. Groups 2 and 3 had significantly more closed over open fractures than group 1 (p -value < 0.05). In group 3 external fixator was not used as definitive treatment. Group 3 had a significantly shorter hospitalization length of 9.4 days (3 – 31; $p < 0.05$).

Conclusions. The use of external fixator as definitive treatment has lost its' role currently, as well as use of ring external fixation in pilon fracture management. Because of shorter external fixation time and faster internal fixation, the time of hospitalisation has significantly shortened. This study shows that there has been an important evolution of Pilon fracture management.

PREVALENCE AND REASONS FOR LITHUANIAN TRACK AND FIELD ATHLETES EXPRESSED DESIRE TO RETIRE FROM ATHLETICS

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Keywords. Athletics; Track and field; Retirement

Objectives. Retirement from competitive sports is a common occurrence, but the reasons for this decision are not always known. As part of the sports team, the physician may wonder what reasons led the athlete to make this decision. However, there is insufficient information in the scientific literature to address this question. Our study aims to determine the prevalence and reasons for Lithuanian athletes' expressed desire to retire from athletics.

Materials and Methods. Of 102 Lithuanian track and field athletes who were provided with an original online questionnaire via "Messenger" app, 60 (response rate 58.82%) agreed to provide information about their willingness to retire from athletics and reasons behind it. IBM SPSS Statistics 23.0 was used for statistical analysis. Pearson correlation was calculated to determine the correlation between two scale, point biserial correlation – between scale and nominal, Spearman correlation – between scale and ordinal variables. Chi2 test was used to determine the dependence between two nominal variables, Cramer's V test – to calculate the effect strength.

Results. The analysis found that 80% of respondents had considered quitting their careers. 41.67% considered it within six months. No significant differences in desire to retire were observed in different ages or sexes ($p > 0.05$). 26.67%, 16.67% and 15% of respondents reported conflicts with coaches, health problems and psychological difficulties as reasons for this decision respectively. There was a statistically significant association between the reason given and the sex of the respondents ($\chi^2 = 13.3$, $p = 0.039$, Cramer's V = 0.471). Females most often identified disagreements with coaches as the main reason, males – physical health problems.

Conclusions. The analysis found that 80% of respondents had considered quitting their careers. 41.67% considered it within six months. No significant differences in desire to retire were observed in different ages or sexes ($p > 0.05$). 26.67%, 16.67% and 15% of respondents reported conflicts with coaches, health problems and psychological difficulties as reasons for this decision respectively. There was a statistically significant association between the reason given and the sex of the respondents ($\chi^2 = 13.3$, $p = 0.039$, Cramer's V = 0.471). Females most often identified disagreements with coaches as the main reason, males – physical health problems.

DTI QUANTITATIVE MEASURES IN PATIENTS WITH NORMAL COGNITION AND COGNITIVE IMPAIRMENT

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Keywords. MRI; DTI; Cognitive impairment; Dementia

Objectives. Diffusion tensor imaging is an advanced magnetic resonance imaging method that can provide data on microstructural organisation and connectivity of white matter. Structural changes and quantitative measures, such as DTI scalars (fractional anisotropy (FA), mean diffusivity (MD), radial diffusivity (RD), and axial diffusivity (AD)) could be associated with cognitive impairment and dementia. Our objective was to evaluate the quantitative data of DTI and compare it in patients with normal cognition and cognitive impairment.

Materials and Methods. We analyzed 25 patients (9 patients with normal cognition and 16 patients with cognitive impairment) who underwent 3T MRI diffusion tensor imaging (DTI) scans and the Montreal Cognitive Assessment (MoCA). The patients were divided into three groups: normal cognition (MoCA > 26), mild/moderate cognitive impairment (MoCA 15–26), and severe cognitive impairment (MoCA < 15). Diffusion magnetic resonance analysis was performed using DSI Studio software. Quantitative measurements of FA, MD, RD and AD were analysed in the following regions: whole brain, forceps major, corpus callosum, forceps minor, left and right fornix.

Results. We found statistically significant differences in AD for the entire brain when comparing normal cognition (NC) with severe cognitive impairment ($p < 0.05$) and between severe cognitive impairment and mild/moderate cognitive impairment ($p < 0.05$). Furthermore, we found statistically significant differences in the corpus callosum body between severe cognitive impairment and NC ($p < 0.01$) and severe cognitive impairment and mild/moderate cognitive impairment ($p < 0.05$).

Conclusions. Quantitative DTI measurements could be used as biomarkers in the diagnostics of cognitive impairment. In our study, we found statistically significant changes in the composition of white matter in the whole brain and in the corpus callosum body in the group of patients with severe cognitive impairment. Larger studies are necessary to validate our findings.

VERTEBROPLASTY

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Keywords. Vertebroplasty; VAS

Objectives. Vertebroplasty is the recommended treatment method in case of a pathological vertebral compression fracture. The main complaint of vertebral compression fracture patients is pain resulting in the inability to perform daily activities which in turn significantly decreases the quality of life. One of the main purposes of vertebroplasty is immediate pain reduction that improves the quality of living. Although vertebroplasty is one of the most common treatment methods for a pathological vertebral compression fracture, it's important to understand that the desired results cannot always be achieved, meaning, post surgery back pain can sometimes remain.

Materials and Methods. The retrospective data about vertebroplasty surgeries from 2017 to 2021 was collected from patient histories at the Hospital of Traumatology and Orthopaedics. Data regarding pain intensity before and after vertebroplasty was gathered using the Visual Analogue Scale (VAS). Additionally, data regarding the patient's age, most common compression fracture vertebral levels, pain intensity before and after vertebroplasty, and the total number of days spent at the hospital was analyzed. All this information was compared to global research data evaluating pain levels and pain reduction based on VAS.

Results. There were 245 vertebroplasties performed at the Hospital of Traumatology and Orthopaedics from 2017 to 2021. Only 61 (25%) of those patients had their pain intensity measured before and after vertebroplasty by using the Visual Analogue Scale (VAS). Among those 61 patients the average VAS score before the surgery was 5.87 points and 4.69 points afterwards. In conclusion, the average improvement after vertebroplasties within this study, as measured by VAS, is 1.18 points.

Conclusions. Pain level in VAS is one of the best and easiest ways to analyze patient's condition and need for surgery. As vertebroplasty is an effective method for treatment, retrospective data showed that only 25% of patients had their pain evaluated by VAS.

UTILITY OF MULTIPARAMETRIC MRI ADC VALUES IN ASSESSMENT OF PROSTATE CANCER GLEASON SCORE

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Keywords. Radiology; Urology; Prostate cancer; Gleason score; MRI; Prostatectomy

Objectives. One of the leading cancers in male population remains prostate cancer (PCa). Multiparametric magnetic resonance imaging (mp-MRI) has gradually taken on a large role in diagnosis of PCa. Studies on apparent diffusion coefficient (ADC) have shown improved accuracy in detection of clinically significant PCa (csPCa). The aim of this study was to evaluate if ADC values could be used to predict Gleason score (GS).

Materials and Methods. A retrospective analysis on 365 patients aged 47–79 years (from January 2019 to December 2022) who underwent a previous mp-MRI (1.5T) with PI-RADS v2.1 $\geq 3/5$ and a following histopathology diagnosis of GS ≥ 6 according to results of radical prostatectomy (RP). All suspected lesions were evaluated by certified radiologists and DWI ADC values in $10^{-3} \text{ mm}^2/\text{s}$ were measured using b values 50 and 1000.

Results. Histopathology revealed clinically significant PCa in 278 patients (GS ≥ 7) and non-significant PCa (nsPCa) in 87 patients (GS ≤ 6). Data analysis demonstrated a characteristic distribution of value based on GS 6–10 (ADCmean $\geq 0.867 \times 10^{-3} \text{ mm}^2/\text{s}$ for GS 6; ADCmean ranging from 0.621×10^{-3} to $0.708 \times 10^{-3} \text{ mm}^2/\text{s}$ for GS 7; ADCmean $\leq 0.558 \times 10^{-3} \text{ mm}^2/\text{s}$ for GS 8,9,10), with a very strong statistically significant negative correlation ($r_s = -0.832$; $P < 0.0001$). However, overlapping values in GS 6–7 groups in 4.8% cases were noted. ROC analysis displayed a significant correlation at ADC threshold value of $0.790 \times 10^{-3} \text{ mm}^2/\text{s}$ ($P < 0.0001$, AUC = 0.980), with sensitivity 95%, specificity 91.7%, PPV 95%, NPV 90% and overall accuracy of 94%.

Conclusions. DC analysis shows prominent capability in defining tumor aggressiveness in clinically significant cancers (GS ≥ 7), which could assist as a dependable biomarker to grade suspected lesions and select patients for targeted biopsy. However, more studies are necessary as there is limitation of measurements in GS 6–7 groups.

SHORT TERM RESULTS AFTER REVISION TOTAL HIP REPLACEMENT WITH DISTALLY-INTERLOCKED MODULAR FEMORAL RECONSTRUCTION PROSTHESIS

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Keywords. Harris Hip Score; Revision arthroplasty; Short-term outcome; Total Hip Replacement

Objectives. Currently, no studies have been conducted in Latvia on early functional capacity findings in patients who underwent hip revision surgery with distally-interlocked femoral prosthesis (REEF stem, DePuy Synthes) after a periprosthetic fracture. The aim of this study is to evaluate short-term clinical and radiological outcomes after revision of total hip arthroplasty with the current prosthesis.

Materials and Methods. The cross-sectional study included 17 patients who underwent revision hip joint surgery with REEF stem at the Hospital of Traumatology and Orthopaedics between 2017 and 2021, with 12 patients in the final analysis. The evaluation of the patient's clinical condition was conducted during follow-up visits to the same hospital using the Harris Hip Score (HHS). Data were analyzed with IBM SPSS 28.0.1.1.

Results. In the study, 12 hip joints were analyzed, the mean age of the patients was 69.6 years, mean body mass index (BMI) 30.38 kg/m² (SD ± 7.64), and women predominated in our study population. Mean follow-up period was 3 years and 3 months (SD ± 41 months). The mean HHS before surgery was 23.50 points (SD ± 16.88) (range, 3–47), with 42% (n = 5) of the patients showing fair to excellent scores, according to HHS. The mean HHS at the follow-up visit was 63.67 points (SD ± 23.22) (range, 40–100), with the lowest scores for the ability to get in public transport the worst and the highest – the ability to sit for long periods. Statistically significant preoperative and postoperative HHS differences were found $t(11) = -5.53$, $p < 0.01$ with a large effect size ($g = 1.49$). No statistically significant correlation was found between HSS at the follow-up visit and the BMI ($r = 0.53$; $p = 0.770$) and follow-up period ($r = -0.123$; $p = 0.704$).

Conclusions. Although the study population is small, the short-term results after hip revision surgery with REEF stem already show significant improvement ($p < 0.01$) in surgery outcome, with several excellent results.

DENTISTRY AND PHARMACY

CHEMICAL PROFILING OF PHENOLIC COMPOUNDS FROM SEA BUCKTHORN TWIGS

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Objectives. Sea buckthorn (*Hippophae rhamnoides* L.) represent a rich source of natural compounds which are responsible for many multifunctional biological effects. In this work, we report the phytochemical composition of aqueous ethanol extracts of unexplored so far new promising plant material sea buckthorn twigs. We gather and systematize available information on identified phenolic with an emphasis on their potential biological activities.

Materials and Methods. Extracts were isolated by the convective extraction of twigs. The UHPLC-UV-TOF/MS was used for identification of individual polar monomeric and oligomeric compounds without modification. The total phenolic content was determined quantitatively using the Folin Ciocalteu reagent, with Gallic acid as the standard.

Results. The extraction results showed that the yield of hydrophilic extractives from sea buckthorn samples is in the range of 15 to 30%. The profiling of secondary metabolites in the extracts of sea buckthorn twigs growing in Latvia by UHPLC-UV-TOF/MS showed that the chemical composition is rich with the polyphenolic compounds, mainly, proanthocyanidins. Total amount of polyphenols in extracts varies from 30 up to 50 GAE · g on 100g dry extract depending on species. Amino acid derivatives such as serotonin, leucine and alanine derivatives, have been identified in the extracts. Flavonoids – catechin, quercetrin, their glycosides, proanthocyanidins from dimer to tetramer, organic acids (quinic acid, gallic acid, caffeic acid) were identified as well.

Conclusions. The results indicate that crude extracts were characterized by a good amount of phenolic compounds. These chemical compounds identified are recognized as biologically active compounds, namely, as antioxidants or antibacterial agents. This research was funded by ERDF project nr. Nr.1.1.1.1/19/A/146 “Biorefinery processing of sea buckthorn non-fruit biomass using innovative techniques and comprehensive analytical investigation, for obtaining prospective for Latvian bioeconomy high value-added products, including serotonin”.

CHEMICAL SCREENING OF PHENOLIC COMPOUNDS IN TANSY LEAVES WILD GROWING IN DIFFERENT CONDITIONS

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Objectives. Tansy leaves have a diverse range of phytochemicals including phenolic compounds, some with notable medicinal properties. It is known that Tansy plants have several chemotypes depending on the growth location. In this context, the main objective of this work was to evaluate the influence of sampling location on chemical composition. The aims of this study were the determination of the polyphenolic profile of *Tanacetum vulgare*

L. (tansy) and the evaluation of chemical composition dependence on sampling location. Leaves from tansy plants collected in different regions of Latvia and their ethanolic extracts were chemically characterized, revealing chemical variability regarding to phenolic compounds and thujone content.

Materials and Methods. The tansy leaves were extracted by aqueous ethanol (50% v/v) using an orbital shaker. The yields of extractives were determined gravimetrically after freeze-drying. Spectrophotometry and liquid chromatography was used for chemical analyses.

Results. The variability of total phenolic was from 31 GAE/g (Ventspils) up to 56 mg GAE/g (Ludza) and thujone 0–3.0%. These results indicate that the accumulation of phenolic compounds and characteristic toxic compound thujone in Tansy leaves depends on the plant material origin. The highest extraction yield of the extract was up to 20% (w/w). The chemical profile of tansy leaves is dependent on sampling location, the extracts from Tansy growing in Ventspils are richer with phenolic acids (21 mg CAF/g), but the extracts obtained from Ludzas samples contain more flavonoids (28 mg QE/g). The major constituents identified as oligomeric proanthocyanidins, chlorogenic acid, apigenin, and its glycoside, quinic acid, rutin, and kaempferol.

Conclusions. We conclude that the sampling location (Latvian regions) is important for the outcome of phenolics (differences almost two times) and for the content of thujones, which can be toxic. It has been shown that the tansy leaves are a potential source for the obtaining of biologically active phenolic agents.

DEVELOPMENT OF NOVEL AMPHIPHILIC N-SUBSTITUTED 1,4-DIHYDROPYRIDINE DERIVATIVES AS GENE DELIVERY AGENTS

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Objectives. Liposomes have been extensively studied as delivery systems due to their efficiency and biocompatibility. Cationic 1,4-dihydropyridines (1,4-DHP) were studied earlier as membranotropic compounds and have been proposed as delivery systems. The properties of liposomes primarily depend on the characteristics of their constituent lipids. Design, evaluation and optimization of the structure of lipids have provided delivery systems with improved performance.

The objective of this study was to synthesize a series of novel N-substituted cationic 1,4-DHP derivatives and evaluate their monolayer and self-assembling properties and transfection activity.

Materials and Methods. Five cationic N-benzyl 1,4-DHP derivatives with varying pyridinium substituents at positions 2 and 6 were synthesized. The monolayer properties were characterized using surface pressure–molecular area isotherms, obtained by KSV NIMA Langmuir trough. The self-assembling properties were studied using dynamic light scattering, samples were prepared by the ethanol injection method. Green fluorescent protein-expressing plasmid was loaded into liposomes and transfection efficiency was assessed *in vitro* using fluorimetry. Lipofectamine served as a positive control, while untreated cells were used as a negative control. Cytotoxicity was determined using the MTT assay.

Results. The target compounds were obtained in 35–75% yields. The structures were confirmed by NMR. The mean molecular area varied from 131–191 Å². The compounds displayed self-assembling properties and formed nanoparticles with an average diameter of 660–1973 nm for the freshly prepared samples. Polydispersity indexes were in the 0.01–2.65 range. Zeta-potential varied from 35.7–90.9 mV. The critical micelle concentration of 1,4-DHPs ranged from 0.006–2.646 µM. All data obtained for the novel N-benzyl 1,4-DHPs was compared with N-unsubstituted 1,4-DHP as a control.

Conclusions. The lipid monolayer, self-assembling properties, and transfection activity of cationic 1,4-DHPs strongly depend on their structure. The introduction of N-substituent to 1,4-DHP cycle and substituents at the cationic head- groups will be discussed from the perspective of structure-activity relationships.

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DEVELOPMENT OF ORIGINAL STYRYLPYRIDINIUM DERIVATIVES AS FLUORESCENT DYES FOR BIOMEDICINAL APPLICATIONS

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Objectives. Styrylpyridinium salts are used as fluorescent probes for biochemical, biophysical, molecular biology studies [Dubur et al., 1984; Xu et al., 2015]. Styrylpyridinium compounds also possess antimicrobial properties [Vaitkiene et al., 2020]. The development of a new class of dyes with desirable photophysical properties is a challenge for the researchers working in this field.

The aim of the study was synthesis and evaluation of physical, self-assembling and biological properties of a set of styrylpyridinium derivatives.

Materials and Methods. Styrylpyridinium derivatives were synthesised from the appropriate aldehydes and 4-picolinium salts according to Vaitkiene et al. [Vaitkiene et al., 2020]. Dynamic light scattering (DLS) method was used for estimation of self-assembling properties of samples prepared by tin film hydration method [Pajuste et al., 2013].

Cytotoxicity of compounds in vitro was assessed by the MTT test on two tumor cell lines – HT-1080 and MH-22A and normal mouse fibroblasts 3T3 [Strokes et al., 2008]. Fluorescent microscopy was used to analyze cell fluorescence.

Results. Set of original styrylpyridinium dyes with variation of aldehyde and N-alkyl moieties was obtained.

Several compounds from the set of obtained dyes formed nanoparticles with the average size around 120 nm of freshly prepared 1mM aqueous solutions. The compounds show an intensive fluorescence, especially in lipophylic medium. Some from the tested compounds have rather high cytotoxicity to tumor cell lines HT-1080 and MH-22A; at the same time basal cytotoxicity to 3T3 cell line was in a range from toxic to harmful. Fluorescent microscopy of cells preincubated with some compounds revealed an intense red fluorescence monitored within at least 5 days of cultivation.

Structure-activity relationships will be discussed.

Conclusions. Variations of structure and alkyl moieties at synthesized compounds strongly affect the properties of the tested styrylpyridinium derivatives.

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DYSREGULATION OF CD44 AND P27 ANTIGENS IN ORAL LEUKOPLAKIA

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Objectives. Although not all leukoplakias transform to carcinoma, oral leukoplakia is known as the most common oral potentially malignant disorder. To predict the clinical course of leukoplakia, the degree of epithelial dysplasia is usually determined. However, the classification of degrees of dysplasia does not reflect early changes at the molecular level. Determination of nuclear and cytoplasmic antigens in different oral leukoplakias can show early steps of malignant transformation.

Materials and Methods. In our study we analyzed 50 cases of oral leukoplakia and 20 samples of normal mucosa. Oral leukoplakias were classified as homogenous and non-homogenous (nodular, verrucous, erythroleukoplakia). Immunohistochemical visualization was performed on the formalin-fixed paraffin-embedded oral leukoplakia and control tissue. CD44 and p27 proteins were assessed by a standard polymer-based visualization En-vision method by Dako Denmark. All graphical images and statistical analyses were performed using the GraphPadPrism 9.0 software (GraphPad Software, San Diego, CA, USA) for MacOS.

Results. In healthy mucosa, CD44 expression was positive in the membranes with an average of five layers of epithelium. In the homogenous oral leukoplakia, membranous expression of glycoprotein was present in an average 17 layers. In non-homogenous oral leukoplakia there was not only membranous expression of CD44, but also occurred in cytoplasm of the affected epithelium ($p < 0.0001$). In normal mucosa the p27 antigen was expressed only in epithelial cell nuclei of intermediate and superficial layers, but not in the basal cell layer. In verrucous and nodular leukoplakia was observed fewer p27 positive cells than in homogenous leukoplakia, however more than in erythroleukoplakia where intraplasmatic protein expression occurred in small groups ($p < 0.05$).

Conclusions. Our study proved the instability of p27 protein and its dual nature in non-homogenous leukoplakia and the pattern of CD44 expression in the cytoplasm of oral epithelium may be used as a predictive factor for potential transformation of non-homogenous leukoplakia into an early stage of cancer.

EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITY OF OAT MILK AND YOGURT EXTRACTS

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Objectives. In recent years, plant-based milk and yogurt alternatives, such as oat milk, have become highly popular. Oats are a great source of antioxidant plant compounds, such as ferulic acid (FA) and isoferulic acid (IFA). The aim of the study was to determine and compare the biological activity of oat milk and oat yoghurt extracts.

Materials and Methods. The determination of the antiradical activity of oat milk extract, oat yogurt extract, FA and IFA standard substances was carried out using DPPH method. The effects of the samples on cell proliferation and viability were tested using the MTT assay. The antioxidant activity of the studied samples was evaluated in cell cultures using the dichloro-dihydrofluorescein method. The expression of CD80 and CD86 in bone marrow-derived macrophages (BMDM) was examined by flow cytometry analysis. Lipopolysaccharide (LPS) was used to induce pro-inflammatory signaling.

Results. The most pronounced antiradical activity was exerted by FA ($EC_{50} = 23.6 \pm 4.1 \mu M$) and oat milk extract ($EC_{50} = 24.8 \pm 6.3\%$ of the solution). Based on the results of the MTT assay, after incubation with oat milk and oat yogurt extracts, the samples significantly promoted macrophage viability (BMDM) but decreased CaCo-2 cell viability by ~20%. FA and IFA did not reduce the viability of CaCo-2 cells and BMDM at concentrations up to 250 μM . Oat yogurt extract, FA, and IFA reduced ROS production in BMDM by 46%, 26%, and 22%, respectively. In CaCo-2 cells, FA and IFA at 100 μM concentration significantly reduced ROS by 61% and 60%, respectively. Preincubation of BMDM with oat milk extract reduced macrophage population M1 (pro-inflammatory) by 50%, FA and IFA at 100 μM concentration reduced the M1 population by 35% and 12%, respectively, compared to the LPS control.

Conclusions. The analyzed oat milk extract showed significantly higher biological activity *in vitro* compared to the oat yogurt extract.

EVALUATION OF DISPENSING MEDICATION ERRORS IN PHARMACEUTICAL PRACTICE AMONG DIRECT ORAL ANTICOAGULANTS PRESCRIPTIONS

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Objectives. According to Europe Medicine Agency, medication errors (MEs) are unintended failure related to medical treatment that has the potential to harm patients. MEs in prescribing, dispensing, storing, preparation and administration are usual, and a significant part of them are preventable. Pharmacists should be attentive because they are the last ones who dispense medicine to patients. This study aimed to describe the most common dispensing MEs among electronically prescribed DOACs using brand names at pharmacies in Latvia.

Materials and Methods. Electronically prescribed direct oral anticoagulants (DOACs) using brand names *Xarelto* (rivaroxaban), *Pradaxa* (dabigatran), *Lixiana* (edoxaban) and *Eliquis* (apixaban) were retrospectively analysed in this study. Anonymised patients' data, prescribed and dispensed medicine description was obtained from the Latvian National Health Service electronic prescription database from January 1, 2017, to June 30, 2022.

Results. Entirety, 412726 prescriptions were acquired, of whom 362580 (87.9%) were dispensed 447275 times in a pharmacy. The total amount of dispensing MEs was 14137 (3.2%). The most frequent issue ($n = 14033$) was that dispensed DOAC doses were larger or smaller than the ones prescribed by physicians. In 12 prescriptions, patients obtained other DOAC. Furthermore, patients received medicines from other pharmacological groups in 92 cases, of whom 19.6% ($n = 18$) had different drug forms. The letter X was present in 26 medicine brand names. There were discovered sound-alike medication errors such as *Xarelto* to *Xefo* ($n = 2$), *Pradaxa* to *Plavix* ($n = 2$), and *Lixiana* to *Lexotanil* ($n = 1$).

Conclusions. This prescription cohort has a relatively high dispensing MEs rate ($> 3\%$). Further investigations are needed to better understand the reasons for this and establish interventions for minimising dispensing MEs. Implementing mechanisms to avoid confusing look-alike and sound-alike (LASA) medicine is also essential.

FACIAL CHARACTERISTICS OF INDIVIDUALS WITH CROSSBITE

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Objectives. Facial morphology is influenced by heritability and environment. Up today, scientific data about the facial parameters in patients with posterior crossbite is missing. The aim of the study was to investigate the upper jaw width and facial parameters in individuals with and without crossbite.

Materials and Methods. The study groups included 26 adolescents with crossbite and 26 adolescents without crossbite. The ages ranged from 14 to 16 years. Intraoral scans were performed and the distances between medial and lateral aspects of the third palatal rugae and interpremolar and intermolar widths were measured. Facial surface scans were acquired with 3dMD imaging system and landmark-based analysis was performed.

Results. Intraoral measurements were bigger in the control group for both males and females, but they reached statistical significance only for males. The control group females showed shorter face heights ($p < 0.001$) and smaller intercanthal widths ($p < 0.05$), while males in control group showed wider nostrils ($p < 0.05$), compared to crossbite group. The control group showed more and higher correlations between intraoral and extraoral measurements and between different facial parameters. In the control group, the morphological nose width and right ($r = 0.663$, $p < 0.001$) and left ($r = 0.715$, $p < 0.001$) nostril widths were intercorrelated, similarly, the philtrum width correlated with the mouth width ($r = 0.579$, $p < 0.01$). In the control group, all intraoral parameters had statistically significant correlations with mouth width, while in the crossbite group, only the interpremolar width correlated with the mouth width, which was also the only significant correlation between intraoral and facial parameters, when the crossbite and control groups were pooled together ($r = 0.549$, $p < 0.001$).

Conclusions. Results of the present study did not show clear associations between crossbite and facial parameters. Only the face height in females and nostril widths in males showed statistically significant differences between the individuals with and without crossbite.

FRACTURE RESISTANCE OF ENDODONTICALLY TREATED MOLARS, RESTORED WITH LITHIUM DISILICATE OR COMPOSITE OVERLAYS AND ENDOCROWNS

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Objectives. To restore an endodontically treated molar with an indirect restoration that both preserves and protects the residual tooth structure is challenging. Besides the conventional crown, which demands invasive tooth preparation, overlay and endocrown allows a less invasive approach to cover weakened tooth cusps, avoiding catastrophic tooth fracture. The aim of this study was to evaluate the fracture resistance and fracture patterns of endodontically treated molar teeth, restored with ceramic and composite overlays and endocrowns.

Materials and Methods. In this prospective cross-sectional in vitro study 40 extracted human molars were included (An Ethics approval Nr. 22-2/94/2021). Teeth were divided into 4 groups: composite core build up with pressed lithium disilicate overlay (n = 10); composite core build up with milled composite overlay (n = 10); pressed lithium disilicate endocrown without composite build up (n = 10); milled composite endocrown without composite build up (n = 10). According to a certain treatment protocol for each group the following treatment was performed: root canal treatment, composite core build up (if necessary), tooth preparation, cementation of restorations. Then the specimens underwent thermocycling (10 000 cycles, 50–55°C) for 7 days, mechanical cyclic loading (0–50 N, 1.6 Hz, 600 000 cycles in 10° slope) for 7 days, and again thermocycling as described before. After preloading, the specimens were subjected to a fracture strength test (5 mm steel ball, 10° inclination, load rate 0.5 mm/min).

Results. All the specimens fractured after mechanical loading (fracture of restoration, n = 14 ; fracture of tooth, n = 26). Teeth restored with both material overlays did not have fractures escalating from restoration to enamel, dentin and cement simultaneously. Catastrophic tooth fractures were seen in teeth restored with both material endocrowns.

Conclusions. Teeth restored with endocrowns presented catastrophic fracture patterns therefore could not be restorable. Teeth restored with overlays and especially lithium disilicate overlays are the best choice for restoring endodontically treated molars.

IN VITRO AND EX VIVO LEVOFLOXACIN ANTIBACTERIAL ACTIVITY AGAINST ESCHERICHIA COLI ISOLATED FROM DOMESTIC RABBITS

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Objectives. Some *Escherichia coli* (*E. coli*) strains can be pathogenic to companion animals, including pet rabbits, causing potentially lethal diarrhoea. Levofloxacin (LVFX) is a fluoroquinolone antimicrobial, approved for human medicine and used off-label in veterinary medicine. LVFX antibacterial effect against *E. coli* isolated from companion rabbits was evaluated.

Materials and Methods. Five *E. coli* strains from clinically healthy pet rabbits were isolated and identified using VITEK2 system. Minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) values were detected with microdilution method according to CLSI guidelines. One isolate with highest MIC value detected in serum was selected for bacterial killing rate determination. Time-kill curves were determined as described by Lee et al (2017). Antimicrobial activity was determined in rabbit serum with addition of LVFX in concentrations of 0.5 MIC–32 MIC (*in vitro*) and in serum samples from rabbits treated with LVFX 5 mg/kg IM and SC administration (*ex vivo*).

Results. Highest *E. coli* MIC was 0.03 µg/mL, highest MBC value was 0.25 µg/mL. After initial bacterial inhibition, 0.5 and 1 MIC concentrations of LVFX resulted in growth of *E. coli* after 24 hours of incubation (lower than control sample). 2MIC – 32MIC concentrations of LVFX, resulted in bacterial eradication after 24 hours of incubation. All serums samples from rabbits treated with 5 mg/kg LVFX parenterally from 0.5, 1, 2, 4, 8 and 10 h post administration were able to eradicate sensitive *E. coli* strain within 24 hours of incubation. AUC_{0–24}/MIC, a PK/PD efficacy index for fluoroquinolones (> 72 represents efficacy, according to Madsen et al., 2019) was calculated to be 302 and 310 h for IM and SC routes of administration respectively.

Conclusions. According to rates of bacterial killing *in vitro* and *ex vivo*, levofloxacin may be an effective treatment for *E. coli* infection eradication for sensitive strains with MIC values of 0.03 µg/mL and lower.

INFLUENCE OF SIGNALING MOLECULES THAT RELEASED IMMEDIATELY AFTER MURINE BONE FRACTURE ON MG63 AND NIH3T3 DURING 7 DAYS

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Objectives. Some bone fractures do not heal on their own, resulting in formation of nonunions. We speculate that in the case of nonunions, signaling molecules that mediate the healing process and activate the cells essential for healing, including fibroblasts that produce collagen fibers, and osteoblasts that deposit calcium phosphate, are underproduced. The objective of this study is to establish whether molecules released upon bone fracturing can stimulate the proliferation and metabolic activity of fibroblasts and osteoblasts, to improve understanding of the fracture healing process and potentially identify molecules that can be used to improve nonunion treatment.

Materials and Methods. Femurs and tibias were obtained from mice remains (C57BL/6J, 9–14 weeks old, both sexes) and soft tissues were carefully removed. Bones were manually particulated and extracted with DMEM or saline for 1 h at 37°C. Extracts containing signaling molecules released by damaged bones were centrifuged and filtered through 0.2 µm filter to remove cells and debris. They were applied to fibroblasts (NIH3T3) and osteoblast-like (MG63) cells. Growth rates were assessed by staining cells and counting cells over a period of 1 week. Metabolic states were assessed by measuring reductase activities with MTT assay.

Results. The extracts of fractured bones had a positive influence on the growth rate of osteoblasts and fibroblasts, increasing the growth rate of the osteoblasts by 40% and fibroblasts growth rate by nearly 30%. Moreover, fibroblasts responded to extracts in dose dependent manner. Reductase activity, as assessed by MTT, increased proportionally to the proliferation of cells.

Conclusions. Our findings indicate that damaged bone indeed releases signaling molecules that greatly enhance the proliferation of osteoblasts and fibroblasts. These results and the prospects of identifying and using these molecules for nonunion treatment will be discussed.

LEVOFLOXACIN ANTIBACTERIAL ACTIVITY AGAINST PASTEURELLA MULTOCIDA ISOLATED FROM DOMESTIC RABBITS

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Objectives. *Pasteurella multocida* (*P. multocida*) are zoonotic Gram-negative bacteria, causing numerous diseases in animals and humans. *P. multocida* is a major respiratory pathogen in rabbits. Levofloxacin (LVFX) is a fluoroquinolone antimicrobial used off-label in veterinary medicine. LVFX antibacterial effects against *P. multocida* isolated from diseased companion rabbits was evaluated.

Materials and Methods. Ten *P. multocida* clinical isolates from pet rabbits with respiratory symptoms (“snuffles”) were obtained. Minimal inhibitory concentration (MIC) and minimal bactericidal concentration values were detected with broth microdilution method according to CLSI guidelines. One isolate with intermediate MIC value detected in serum was selected for bacterial killing rate determination. Time-kill curves were determined as described by Lee et al (2017). Antimicrobial activity was determined in blank serum with addition of LVFX in concentrations of 0.25 MIC – 64 MIC (*in vitro*) and in serum samples from rabbits treated with LVFX 5 mg/kg IM and SC administration (*ex vivo*).

Results. *P. multocida* MIC values were 0.008–0.5 µg/mL, MBC values 0.015–0.5 µg/mL. An isolate with MIC 0.015 µg/mL was used for time kill evaluation. LVFX concentrations of ¼ – 1 MIC concentrations did not inhibit bacterial growth after 24 hours of incubation 2 MIC – 64 MIC concentrations of LVFX, resulted in bacterial eradication after 24 hours of incubation. All serums samples from rabbits treated with 5 mg/kg LVFX parenterally from 0.5, 1, 2, 4, 8 and 10 h post administration was able to eradicate sensitive bacterial strain within 24 hours of incubation. AUC_{0–24}/MIC, a PK/PD efficacy index for fluoroquinolones (> 72 represents efficacy, according to Madsen et al., 2019) was calculated to be higher than 600 h for both IM and SC routes of administration.

Conclusions. According to rates of bacterial killing *in vitro* and *ex vivo*, LVFX is effective for *P. multocida* infection eradication in rabbits, however further dose studies are required.

MATERIALS FOR FIXED DENTAL PROSTHESES PRODUCED BY DIGITAL MANUFACTURING AND GINGIVAL HEALTH: LITERATURE REVIEW

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Objectives. To analyze the last 10 years of research on the effects of digital (CAD/CAM) fixed prostheses manufacturing methods and materials on soft tissue health.

Materials and Methods. Literature search was conducted electronically in databases EBSCO, Science Direct, PubMed, Cochrane Library for the time period 2012 to 2022 including publications in English. Key words: *marginal fit, periodontium, CAD/CAM, clinical outcomes, bleeding on probing, composite resins, gingival response, plaque index, gingival index, pocket depths, monolithic lithium disilicate, gingival biotype, milling, three dimensional printing, zirconia, metal, PMMA* using the words in various combinations.

Results. A total of 427 articles were selected. The number of clinical studies according to the materials used: zirconia (65 articles), lithium disilicate (40 articles), composite (36 articles), PMMA (25 articles), metal (19 articles). More information about CAD/CAM milling technique (210 articles), less about 3D printing (32 articles), information about traditional manufacturing methods (casting, layering by hand) used in comparative studies. The articles were analyzed including prospective, randomized controlled and retrospective studies where the condition of periodontal or peri-implant tissues were evaluated simultaneously with the evaluation of the clinical results of the materials. The mentioned biological parameters – plaque index, bleeding on probing, pocket depth, technical parameters– marginal fit, surface roughness. The average research time in scientific articles was from 6 months to 1 year.

Conclusions. Study results with variability in surface roughness (increased surface roughness for SLS composite) and marginal fit (horizontal overhang for zirconia crowns) are noted as clinically acceptable relative to biological parameters (bleeding on probing). The CAD/CAM milling technique has decreased negative impact on soft tissues. Research into 3D printed prostheses continues due to the fact that some materials (PMMA) show inadequate biocompatibility. It is recommended to extend the research period to obtain a long-term results.

PATIENT-SPECIFIC TITANIUM IMPLANT SOLUTION FOR TOTAL ATROPHIC UPPER JAW: CASE REPORT

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Objectives.

Introduction. Conventional implant procedures are often not possible in cases of significant atrophy, leaving patients with few treatment options. In this case report, we present a treatment method using a patient-specific titanium implant (by KLS Martin Group) to address total atrophic upper jaw in a single operation. Every phase from first visit till 6 months postoperative was documented.

Methods. A 48 year-old male presented to a prosthodontist with a failing total metal-plastic bridge. After dental revision, most of the maxillary teeth were extracted (excluding D13, D23) and removable partial denture was fabricated. As the patient was insisting on fixed prosthesis and due to extensive maxillary atrophy, simple implant based restoration was not possible. Primary D13, D23 extractions as well as soft tissue augmentation in the posterior region with Epiflex (decellularized human skin tissue) was carried out. Dual scan protocol was used together with an intraoral scanner using teeth in wax dentures with radio-opaque composite landmarks. Proper occlusion was achieved and using the dental arch as a reference implant pillar position was planned. Titanium implant design was produced through IPS Gate interaction software. Surgery was done under general anaesthesia (nasotracheal intubation). Implant was fixed with 29 bicortical screws. Surgery was 4 hours long. Immediate total prosthesis (composite with glass reinforcement) was fixed on the implant with ~15Ncm. Follow-up included the following sequence (1 day, 1 week, 2 weeks, 1 month, 3 months and 6 months after surgery) and except unrelated viral infection it was uneventful.

Results. The patient-specific titanium implant was successfully placed and integrated into the atrophic jaw.

Discussion & Conclusions. This case report demonstrates the potential of patient-specific titanium implants as a treatment option for patients with significant alveolar bone atrophy. Further research is needed to fully understand the effectiveness and long-term outcomes of this procedure.

PLATELET-RICH FIBRIN IMMUNOLOGICAL TESTING USING ELISA ASSAY

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Objectives. The immunological properties of PRF rely on its ability to release autologous growth factors and cytokines in supraphysiologic concentrations. Various studies are describing ELISA immunological assay as the method to evaluate the concentration of various proteins in PRF. The lack of information in the literature regarding methodology and used PRF dilutions make protein evaluation a challenging task.

Materials and Methods. Peripheral blood samples from 18 volunteers were drawn with the butterfly blood collection method in 10 mL S-PRF tubes. Tubes were placed in a centrifuge and centrifuged at 700 rpm for 3 or 4 min according to Choukroun's protocol to obtain i-PRF and frozen immediately at -80°C. Aliquots of i-PRF samples were prepared by thawing frozen i-PRF samples on ice and were frozen again. Before the performing ELISA assay, i-PRF samples aliquots were thawed on ice and placed at room temperature to clot for 30 minutes. The supernatant around clots was used to perform an ELISA assay according to instructions from kit manufacturer and i-PRF samples were diluted to make 4 different concentrations to be in the range of protein detection.

Results. ELISA assay demonstrated high concentrations of TGFb1, EGF and VEGF in i-PRF. TGFb1 was found in the highest concentration compared to EGF and VEGF, which were more similar to each other. The differences in each patient's protein content pattern were found. Tested proteins were in a range of detections using i-PRF supernatant dilutions: 1:4, 1:15, 1:100 and 1:200 for EGF; 1:1, 1:4, 1:20 for VEGF; and 1:100 and 1:400 for TGFb1.

Conclusions. i-PRF contains various growth factors in supraphysiological concentration. Between tested proteins TGFb1 is found to be in much higher concentrations. This research was funded by the European Union's Horizon 2020 research and innovation program under the grant agreement No 857287 and the Latvian Council of Science research project No. lzp-2020/1-0054 (MATRI-X)".

PULP REVITALISATION TREATMENT OF YOUNG PERMANENT TEETH AFTER TDI

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Objectives. Aim: To show revitalization treatment after traumatic dental injury (TDI) of young permanent incisor followed by pulp necrosis.

Case report: An 7-year-old girl had a traumatic injury at waterpark in Egypt. Patient referred to clinic 9 days after accident. Clinical examination showed total avulsion of d21 and complicated crown fracture of d11 with a pulp necrosis, changed colour of crown, increased mobility and positive percussion test. Radiographic examination revealed immature apex of d11 (root formation stage $\frac{3}{4}$). D11 was splinted to neighbouring tooth on distal side with flexible wire splint for 2 weeks, initial endodontic treatment was started with Ca(OH)₂ dressing. After 2 weeks d11 had increased mobility. Splint was removed after 4 weeks: d11 – stable, percussion test – negative. After 2 months of trauma revitalization procedures was started. 1st visit – disinfection with 20 mL NaOCl 1.5%, 5 mL NaCl, 20 mL EDTA 17% and placement of Ca(OH)₂ dressing, IRM. 2nd visit – disinfection with 20 mL EDTA 17%, induction of blood clot, placement of resorbable matrix and MTA as a capping material, IRM.

Discussion: Pulp necrosis as a consequence of trauma results in cessation of root maturation leaving the roots of the teeth prone to root fracture and tooth loss (1) Revitalization is a biologically based treatment as an alternative to apexification in properly selected cases. (2) A number of dental stem cells have been identified (incl. from apical papilla, PDL) which have ability to differentiate into specialized cells after being triggered (3). Bringing stem cells into root canal allows formation of new tissues in root canal space and further root maturation. (3)

Conclusion: There is a great potential in dental tissues with their ability to differentiate. After 2 and 3 years of follow-up there is increase of root thickness and length of d11.

REGIMES OF SDF COMPARED WITH TIEFENFLUORID FOR SEVERE EARLY CHILDHOOD CARIES – RANDOMISED CLINICAL TRIAL

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Objectives. Effective non-invasive management options and regimes for dental caries affecting primary dentition are still being developed. These usually include topical fluoride, but new formulations can be brought to market without establishing their efficacy. This clinical study compared market standard 38% silver diammine fluoride (SDF, SDI Riva Star) with a novel formulation Tiefenfluorid (TF, Humanchemie GmbH) for major failures (pain, abscess, extraction) and minor failures (lesion progression) in children \leq 71 months of age with early, and severe - early childhood caries.

Materials and Methods. This randomised control, six-arm, patient/parent-blinded, superiority, placebo-controlled clinical trial (Institute of Stomatology, Riga Stradins University, Latvia), from 01/9/2020 to 01/08/2022 (Ethics Committee Nr.6-1/06/20) compared: 1) SDF four applications, one week apart (SDF1); 2) SDF biannually (SDF2); 3) TF four applications, one week apart (TF1); 4) TF biannually (TF2); 5) placebo four initial applications, one week apart (P1) and 6) placebo biannually (P2). Data analyses and visualisation: R statistics programme (R Core Team, 2013).

Results. 428 children were randomised with loss to follow-up of 12.6% (7.0-18.6%). The mean (min, max, SD) follow-up time was 374 (315, 536, 39) days.

Primary outcome results: SDF2 group had a statistically significantly lower rate of major failures at 21.5% compared to the other groups ($p < 0.001$) with SDF1 = 45.5%; P2 = 48.3%; P1 = 49.2%; TF2 = 50.9% and TF1 = 53.0%).

Secondary outcome results: Biannual SDF application resulted in the highest rate of lesion arrest with 50.4% of lesions arrested in SDF2 group, 42.7% in SDF1, 39.2% in TF2, 27.7% in TF1, 24.8% in P2 and 20.1% in P1.

Conclusions. In Latvian children referred for treatment for early and severe-early childhood caries, SDF applied biannually prevented more pain, abscesses and the need for extractions as well as resulting in a higher rate of lesion arrest compared to the other fluoride regimes and placebos.

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REPORT ON NEW COST PROJECT CA 21140 – INTERCEPTION OF ORAL CANCER DEVELOPMENT

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Objectives. The oral cavity is the most common site of squamous cell carcinoma, the precursor of which is oral potentially malignant disorder (OPMD). Interception of oral cancer development COST Action aims to develop a new multidisciplinary approach and to reorganize disease care management by establishing support for people affected by OPMD, which will result in prevention of malignant transformation.

Materials and Methods. The working groups of Action will be organized in several levels: of the patients' medical histories; of the caregivers; of the clinical and translational researchers; at the level of the population. The network will bring together participants from different 23 COST countries with 108 participants

Results. The current situation in this field shows the need to perform disease trajectory analysis based on healthcare data from population-wide registries on country levels. To improve patient's care based on disease management and develop electronic-Health tools for patients' monitoring. Objective methods to improve early detection of OPMD will be explored. The development of standardized procedures for sample collection, characterization, and molecular risk-assessment to improve patient stratification will be coordinated, as well as development of clinical models to evaluate new pharmacological approaches for early detection of cancer. There is a need to understand the socio-economic and ethical impacts of developing personalized preventive medicine.

Conclusions. In accordance with the Action aims, new multidisciplinary approach will be developed, the research interaction and collaboration between research groups and industrials, will be facilitated. Disease care management by establishing support for people affected by OPMD will be reorganized, thus preventing malignant transformation as early as possible. The cooperation with the policy makers and regulatory bodies to implement the Actions findings into everyday clinical practice and life will be facilitated. An innovative approach to address the prevention challenges beyond weaning programs and anti-smoking/drinking advertising campaigns is foreseen.

RETROSPECTIVE TREATMENT RESULTS OF ISOLATED ORBITAL FLOOR FRACTURES TREATED IN PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL

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Objectives. Orbital floor fracture treatment is challenging due to its anatomy, surgical approaches, and repair possibilities. Aim of study was to analyse treatment results in adult patients with isolated orbital floor fractures treated in P. Stradins Clinical University hospital (CUH) from 2019 till 2021.

Materials and Methods. All consecutive adult patients with isolated orbital floor fracture, who underwent surgical treatment in P. Stradins CUH from 1st January 2019 till 31st December 2021 were included in the study. All patients were treated using titanium mesh placed via subciliar or transconjunctival approach. All patients had pre and postoperative CT scan. Orbital volume changes were measured before and after repairment and compared with intact orbit. Measurements was preformed using free of charge program 3D Slicer 5.0.3 r30893 / 7ea0f43 Supported by: NA-MIC, NAC, BIRN, NCIGT and the Slicer Community. All measurements were performed by one person. To determine the difference between orbital volumes before and after surgery and between healthy and affected orbital volume, the paired t-test was used (significance $p < 0.05$)

Results. In total 75 adult patients were included in the study, of them 56 underwent orbital floor reconstruction, in 19 patients' surgery was not necessary. Orbital volume measurements were performed in 30 patients' CT scans. 26 patients were excluded due to lack of data. Four patients had additional intervention.

The difference between affected and healthy orbital volume before surgery was statistically significant, but after surgery the difference was not significant. The difference in affected orbital volume before and after surgery was statistically significant. Inter-rater mean difference between volumetric measurements was 2.55%.

Conclusions. The symmetry of orbital volume was restored after surgery, however, it would be advisable to introduce new technologies in P. Stradins CUH to facilitate and improve treatment methods and results.

ROLE OF EPSTEIN-BARR VIRUS IN PATHOGENESIS OF ORAL LICHEN PLANUS

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Objectives. Oral lichen planus (OLP) is chronic inflammatory disease affecting ~2% of the general adult population, and has up to 1% chances of malignant transformation. The aetiology of it is unknown, however there is some information on the involvement of Epstein-Barr virus (EBV) in the aetiology of OLP. The aim of the study was to evaluate the association of EBV infection with OLP based on viral load in saliva and to estimate any viral changes in the tissue samples morphologically.

Materials and Methods. 22 patients (17 females and 5 males), ages between 18–75, who visited Clinic of Maxillo-facial surgery and Oral Medicine were included in the study. The diagnosis was confirmed by histopathological investigation of the lesions. Saliva samples were taken on the first visit, stored at -80 degrees and later transported to the Institute of Microbiology and Virology for real time PCR.

Results. 13 patients had reticular form of OLP and 9 erosive forms. Out of 22 patients 21 were anti-EBV IgG seropositive however, not all the patients showed EBV presence in saliva. Saliva samples of 13 patients were EBV PCR positive, 10 of them where patients with reticular form of OLP, moreover 4 of these patients had viral load more than 105 EBV copies/mL saliva. Morphology of OLP showed a dense infiltrate formed mostly of lymphocytes and macrophages under the mucosal epithelium, migration of inflammatory cells intraepithelial, as well as apoptotic epithelial cells and vacuolar damage of them in the lower mucosal layers and the degeneration of the basal layer, which may indicate the presence of virus.

Conclusions. The results of this pilot study suggest that EBV infection is associated with or is the trigger factor for OLP development. However, these results are preliminary, and larger study is required to draw global conclusion on the role EBV in OLP pathogenesis.

ROLE OF LATVIAN PHARMACISTS IN VALPROATE AND ORAL RETINOID PREGNANCY PREVENTION PROGRAMME

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Objectives. It is crucial to involve pharmacists in risk minimization processes, as pharmacists are the last link between patients and medications. This is especially urgent for medicines such as oral retinoids and valproates with well-known teratogenicity risks. The aim of this work was to describe (1) the knowledge of Latvian pharmacists about the risks of oral retinoids and valproates and the Pregnancy prevention programme (PPP) for women of childbearing age, as well as (2) pharmacists' use of PPP materials while dispensing oral retinoids and valproate-containing medicines to women of reproductive age.

Materials and Methods. Two anonymous electronic questionnaires with questions about pharmacists' knowledge and experience with dispensing valproates and oral retinoids and the use of PPP materials were distributed among Latvian pharmacists. Obtained data were analysed with descriptive statistical methods.

Results. 55 valproate and 54 oral retinoid questionnaires were received, 38 and 46 accordingly were included in our analysis. All respondents except one (in the valproate questionnaire) were aware of the teratogenic risks of valproates and oral retinoids. The warning on the outer packaging was most often used and considered as the most effective PPP tool for both medicines. Other PPP tools were considered as not useful for pharmacists' consultations. Most of the respondents (58.1% for valproates and 75.6% for retinoids) confirmed that they always inform about necessity of effective contraception while dispensing valproates or oral retinoids and advise to consult with the physician immediately if pregnancy is suspected. As a main obstacle for PPP use respondents mentioned the absence/unavailability of these materials (42.3% for valproates, 41.7% for oral retinoids).

Conclusions. Latvian pharmacists are well informed about the risks of oral retinoid and valproate-containing medicines for women of childbearing age. Improvements are necessary to successfully implement the PPP in pharmacists' daily practice.

THE IMPACT OF EXTRACTION AND PROCESSING METHODS ON THE PHENOLIC ACID CONTENT OF TWO GENUS VACCINIUM SPECIES

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Objectives. The *Vaccinium* genus contains fruit-producing shrubs widely spread across Northern Europe and America. Members of this family, particularly cranberries, have a long-established role in traditional medicine and have reported pharmaceutical activities ranging from antimicrobial to anti-aging. *Vaccinium myrtillus* (bilberry) and *Vaccinium corymbosum* (highbush blueberry) fruits have recently gained interest from the scientific community thanks to the high content of bioactive ingredients and micronutrients. This study aimed to determine the impact of extraction and processing methods on the phenolic acid content of bilberries and highbush blueberries of Latvian origin.

Materials and Methods. A total of four *V. myrtillus* and nine *V. corymbosum* samples were analyzed using HPLC-UV, TLC, and the total phenolic acid content was determined using a UV/VIS spectrophotometer. Six phenolic acids were used as reference standards. Extraction was performed on whole berries, as well as just their skins. Extraction using maceration for 24 hours vs ultrasound-assisted extraction was compared. The impact of the ethanol and methanol solutions used for extraction was determined using different concentrations and acid additives.

Results. It was determined that chlorogenic acid is the dominant phenolic acid of both bilberries and highbush blueberries, and its content is 7–8 times higher in highbush blueberries (7 mg/g lyophilized extract) than in bilberries (0.9 mg/g lyophilized extract). The quality and application of lyophilized extract are impacted by conditions and length of lyophilization. The highest content of phenolic acids can be obtained using berry skins and extraction using an ultrasonic bath.

Conclusions. The phenolic acid content of extracts was significantly affected by sample processing and extraction methods used for both species studied. Chlorogenic acid concentrations in highbush blueberries call for further investigation of their potential application in novel pharmaceutical preparations.

TREATMENT PATTERN AND PATIENT PROFILE DIFFERENCES IN INFLAMMATORY BOWEL DISEASE PATIENTS BETWEEN 2013 AND 2019 IN LATVIA

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Objectives. Determine the treatment pattern and patient profile differences in inflammatory bowel disease (IBD) patients between 2013 and 2019 in Latvia.

Materials and Methods. Retrospective analysis of reimbursed medicines claims for IBD diagnoses from the Latvian National Health Service database (NHS) was conducted for year 2013 and 2019. Systemic therapy was defined as use of steroids, azathioprine, 6-mercaptopurine or biological therapies (adalimumab, infliximab, ustekinumab, vedolizumab).

Results. From 2013 to 2019 number of treated IBD patients changed from 1644 to 2626, representing a 59.7% increase. Analysis of Crohn's disease (CD) patients that were using systemic therapy in 2013 included 68 unique patients, 36.7% female, average age 35.2 years and in 2019 144 CD patients (41.6% female, average age 35.3 years), significant differences were found in gender balance ($p < 0.05$). For year 2013 – 151 ulcerative colitis (UC) patients, 50.3% female, average age 45.4 years and in 2019 246 UC patients (50.4% female, average age 44.1 years). No differences were found in gender balance, but significant difference in age ($p < 0.05$).

Systemic therapy uses from 2013 to 2019 in Crohn's disease increased 8.4-fold, and in Ulcerative colitis 1.6-fold ($p < 0.05$). Increase both in systemic monotherapy and combination therapy was observed in 2019, by 78.1% and 91.7% respectively.

In 2019 82 unique patients received biological therapy, 53 for CD and 28 for UC diagnosis. Patient profile receiving biologics was significantly younger compared to total patient pool receiving any systemic therapy, 28.4 years for CD (11–67 years) and 37.3 for UC (11–66). Regional differences in treatment patterns were also observed, where patients living in rural area are less commonly prescribed biological therapy ($p < 0.05$).

Conclusions. Treatment accessibility for IBD patients due to NHS incentives improved dramatically from 2013 to 2019. Biological therapies are mostly prescribed for younger patients living in capital or regional cities. Further studies should consider this breakthrough in therapy accessibility.

VALIDATION OF COMPUTATIONAL FLUID DYNAMICS SOLVER FOR DRUG DISSOLUTION AND TRANSPORT IN USP2 APPARATUS

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Objectives. The study is a part of the larger research plan aimed to create a drug dissolution model based on the application of surrogate modeling by applying Computational Fluid Dynamics (CFD) and drug release/disintegration kinetics approaches to reduce resources and environmental impact needed for a new drug delivery system development. Development and experimental validation of CFD models for a simple, laboratory controlled systems as the first step are the main subjects of the ongoing efforts.

Materials and Methods. The pure drug (paracetamol, acetaminophen, IUPAC N-(4-hydroxyphenyl) dissolution in a water was used due to its simplicity, availability and already existing large knowledge base. CFD simulations of paracetamol tablet dissolution and diffusive/convective transport in USP2 apparatus was carried out for different revolution speeds and other model parameters. Open sourced CFD toolkit OpenFOAM as the main simulation platform was chosen for its growing popularity and general accessibility. Devoted CFD solver reactorDyMCFoam acting on rotating mesh (based on pimpleDyMFoam) with concentration field addition was developed in C++ and tested with the basic cases from literature. Turbulence was modeled with Large Eddy Simulation turbulence models and by direct solution of incompressible Navier-Stokes equations. Validation experiments was carried out at RSU with USP apparatus and another equipment. Several angular velocities for USP2 paddle rotation were used for CFD model calibration. A few dissolution experiments were performed with another methodology.

Results. The main numerical difficulty for direct CFD simulation of above mention system is very small values of paracetamol diffusion in the water ($\sim 6 \times 10^{-10} \text{ m}^2/\text{s}$). Fine tuning of region mesh and introduction of special boundary conditions for concentration was necessary ensure an acceptable CFD predictability.

Conclusions. The overall main solution kinetics trends are captured by the CFD models and results are available for further surrogate modelling.

VIRTUAL PLANNING AND PATIENT SPECIFIC SURGERY GUIDES IN MANDIBLE AND MAXILLAE TUMOUR RECONSTRUCTION WITH FREE FIBULA FLAPS

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Objectives. Wide resection remains the first-choice method for tumors of oral cavity. The main goal of preoperative planning is to develop customized surgical approach with patient specific cutting guides of mandible or maxillae, osteotomy guides of fibula and pre-bended osteosynthesis plates.

Materials and Methods. Twenty-three patients underwent mandible or maxillary reconstructions during the period of 2021 to 2022. All patients underwent one stage resection and reconstruction with microvascular bone flaps. All cases were 3-D virtually preplanned and surgical cutting guides were prepared using 3-D printers and sterilized.

Results. All patients underwent bone defect reconstruction with free osteocutaneous fibula flap. In two cases additional lateral femoral condyle flap was used for mandible condyle reconstruction. Preoperative 3-D virtual planning matched surgical plan in all, except one case. All patients recovered well and was discharged from the hospital totally independent from nasogastric tube and tracheostomy. All patients achieved intelligible speech, mouth opening over 3 cm and good functional and aesthetic outcome.

Conclusions. Individual 3-D virtual planning is a key for a better symmetry and functional outcome. Development of patient specific surgery guides provides more anatomical reconstruction and decreases the time of surgery.

VOLUMETRIC CHANGES OF MALAR IMPLANTS 12 MONTHS AFTER AUGMENTATION

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Objectives. High and prominent cheekbones have long been considered a standard of beauty in many cultures. Different materials have been used to augment the malar region, hydroxyapatite granules being one of them. Volumetric stability is one of the key factors for predictability and patient satisfaction. Main disadvantage of using hydroxyapatite granules mixed with collagen is the decrease of implant volume. To counteract this volume loss, it is required to use excessive amount of material initially.

To evaluate volumetric changes of 90 malar implants in 45 patients over 12-month period after surgery and to analyze the amount of volume decrease.

Materials and Methods. Volumetric analysis was performed on CBCT images of patients that received HAP/collagen implants to augment malar region during orthognathic surgery. To find volumetric changes and the corresponding areas in which they occur, voxel-based superimpositions of the examination data were done. To calculate volumetric differences the areas of interest were segmented to form a closed area and then filled to form solid objects followed by Boolean operations to determine the changes quantitatively and qualitatively. For every patient each cheekbone was analyzed separately.

Results. Volume loss was most prominent during first 4 months after surgery, resorption rate after 4 months was minimal. Median volume increase after surgery was 2923mm³ and after 12 months the median volume of implants was 2028 mm³, that amounted to median volume loss of 26.35%

Conclusions. Volume loss of hydroxyapatite/collagen implants can be detected. Method of CBCT analysis, described in this work, provides valuable info about volumetric stability of implants.

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COMPARISON OF SEXUAL FUNCTION IN MALE SIGMA-1 RECEPTOR KNOCKOUT AND WILD-TYPE MICE

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Keywords. Sigma-1 receptor; Sexual function; Testosterone; Dehydroepiandrosterone; Serotonin

Objectives. Sigma-1 receptor (Sig1R) is an endoplasmic reticulum protein, expressed in variety of tissues, such as the brain, peripheral nervous system and testes. Several studies show involvement of Sig1R in sexual function of experimental animals; however, physiological regulation and the exact role of this receptor in sexual function remain unknown. Currently it is established that dehydroepiandrosterone, a primary precursor of sex steroids, is a Sig1R endogenous ligand. Present study aims to compare sexual function in male Sig1R knockout (KO) and wild-type (WT) mice.

Materials and Methods. To describe sexual function, mating test was carried out in sexually experienced, adult CD-1 male Sig1R KO and WT mice. Vas deferens contractility was assessed in an isolated organ bath system. Dehydroepiandrosterone sulfate (DHEA-S), testosterone and follicle-stimulating hormone (FSH) concentrations in blood plasma were measured with ELISA. To assess depression-like behavior and exclude its possible effect on sexual function, tail suspension test was performed, and serotonin levels were detected in blood plasma and brain tissue using targeted metabolic profiling.

Results. Sig1R KO mice had increased latency of ejaculation and decreased contractility of vas deferens, comparing with WT mice. DHEA-S and testosterone levels were decreased, and levels of FSH were increased in blood plasma of Sig1R KO mice. Immobilization times in tail suspension test were significantly lower in Sig1R KO, and serotonin levels in brain tissue and blood plasma were significantly higher, compared to WT mice.

Conclusions. Sig1R KO mice had delayed ejaculation and decreased contractility of vas deferens, which is associated with decreased concentration of sex steroid hormones. Additionally, reduced behavioral despair in Sig1R KO mice is related to activation of serotonergic system. In conclusion, Sig1R plays a significant role in male sexual function and could be a potential drug target for treating premature ejaculation.

THE ROLE OF SIGMA-1 RECEPTOR IN NEUROLOGICAL IMPAIRMENTS AND HISTOLOGICAL CHANGES AFTER TRAUMATIC BRAIN INJURY

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Keywords. Traumatic brain injury; Sigma-1 receptor; Astrocytes

Objectives. The potential physiological importance of sigma-1 receptor (Sig1R) is deduced from its association with many neurodegenerative disorders. Recessive mutations in Sig1R result in a loss of neurological function or death of nerve cells. Subsequent studies showed that activation of Sig1R is neuroprotective in a variety of conditions, including, Alzheimer's disease, Parkinson's disease and ischemic brain injury. This study aimed to define the role of Sig1R in the brain after traumatic brain injury (TBI) up to 12 months post injury.

Materials and Methods. To induce TBI, a lateral fluid percussion model was used on wild-type (WT) and Sig1R knockout (KO) mice. Neurological Severity Score (NSS) was assessed 1, 7, 14 days and up to 12 months after TBI to evaluate sensorimotor function. Immunohistochemistry was performed in brain tissues 12 months after TBI. Iba1 and GFAP staining was done to assess brain inflammation and astrocyte activation, respectively. Glt-1 antibody was used as an astrocyte marker. Staining intensity was registered in cortex, hippocampus, and thalamus by ImageJ software.

Results. TBI induced significant neurological impairments in WT but not in Sig1R KO animals 24 hours after TBI. From the second week and up to 12 months postinjury the NSS was also considerably increased in Sig1R KO TBI group compared with Sig1R KO sham animals. Unlike Sig1R KO mice, TBI resulted in a significant increase in GFAP staining intensity in the cortex of WT animals. Surprisingly, in both Sig1R KO groups GFAP was reduced by nearly 80% in the cerebellum. No significant difference in Iba1 and Glt-1 staining was found.

Conclusions. The Sig1R deficiency led to improved neurological function along with reduced astrocyte activation in the brain shortly after TBI in mice. These findings suggest a role of Sig1R in the neurodegenerative processes of TBI and highlight Sig1R as a novel drug target after brain injury.

ANALYSIS OF BLOOD TEST DATA FROM LITHUANIAN TRACK AND FIELD ATHLETES WITH SUSPECTED RED-S SYNDROME

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Keywords. RED-S; Athletics

Objectives. RED-S (relative energy deficiency in sports) is a term that refers to abnormalities in various body systems that result from inadequate caloric intake relative to caloric expenditure. The syndrome is known to affect many organ systems, but there is not yet enough scientific data on its effects. This research aims to analyse the blood test data from Lithuanian track and field athletes with suspected RED-S syndrome.

Materials and Methods. During retrospective analysis, anamnestic, body mass composition and blood test data from 10 Lithuanian track and field athletes (6 – male, 4 – female), who met the selection criteria (clinical RED-S symptoms, low relative body fat mass, 12–14h per week of training), was evaluated. That included ionised and total calcium, potassium, sodium, ferritin, glucose, lipidogram, and complete blood count. IBM SPSS Statistics 23.0 was used. Pearson correlation was calculated to determine the correlation between the two scales, while point biserial – between scale and nominal variables.

Results. A decrease in ionised calcium was seen in all athletes (mean – 1.021 mmol/L; median – 1.020 mmol/L), with total calcium levels in the normal range. Average body potassium level was found to be 4.08 mmol/L (median – 4.15 mmol/L), mean ferritin concentration – 34.29 µg/L (median – 31.35 µg/L), with statistically significant relation to the sex ($r = 0.676$; $p = 0.032$). Observed mean neutrophil count was 2.79×10^9 units/L (median: 2.7×10^9 units/L), mean lymphocyte count – 1.97×10^9 units/L (median: 2.05×10^9 units/L). A significant correlation was found between a higher body fat percentage and a higher neutrophil count ($r = 0.748$; $p = 0.013$). Significant correlations were also found between lower relative body fat percentage and lower relative neutrophil ($r = 0.757$; $p = 0.011$) and higher relative lymphocyte count ($r = 0.836$; $p = 0.003$).

Conclusions. In RED-S syndrome decreased ionised calcium concentrations, low ferritin and potassium may be expected. A lower neutrophil count is also likely, directly related to the reduction in relative fat mass.

THE SEX-DEPENDENT ROLE OF SIGMA-1 RECEPTOR IN LEFT VENTRICULAR FUNCTION OF THE MICE HEART

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Keywords. Sigma-1 receptor; Echocardiography; Cardiac contractility; Ejection fraction; Fractional shortening

Objectives. Sigma-1 receptor (S1R) is a chaperone protein that regulates the function and activity of different proteins. S1R activity is modulated by sex hormones. In recent years the role of S1R in the pathogenesis and therapy of cardiovascular diseases has started to emerge. This study was conducted to characterize the role of S1R in left ventricular function of male and female mice hearts.

Materials and Methods. The function of the left ventricle was assessed in 12-week-old wild type (WT), S1R knockout (S1R^{-/-}) and heterozygous (S1R^{+/-}) male (n = 10 in each group) and female (n = 10 in each group) mice using echocardiography. During the echocardiography, mice were anesthetized with 2.5% isoflurane. M-mode tracings of the left ventricle were recorded at the papillary muscle level from a parasternal short-axis view using Philips iE33 ultrasonograph equipped with a linear L15-7io transducer (Philips Healthcare).

Results. The analysis of echocardiographic data revealed that S1R^{-/-} male mice had statistically significantly lower ejection fraction (EF) compared to WT mice. The EF in WT, S1R^{+/-} and S1R^{-/-} mice were $80 \pm 1\%$, $79 \pm 1\%$ and $74 \pm 1\%$, respectively. In addition, male S1R^{-/-} mice had lower fractional shortening (FS) compared to WT mice. The FS in WT, S1R^{+/-} and S1R^{-/-} mice were: $43 \pm 1\%$, $42 \pm 1\%$ and $38 \pm 1\%$, respectively. There were no differences between anatomical and functional parameters of the left ventricle in female mice.

Conclusions. The absence of S1R leads to a lower EF and FS of the left ventricle in male mice, which means that S1R is involved in the regulation of function of the left ventricle. The effect is sex-specific and is not observed in S1R^{-/-} female mice.

EVALUATING THE LIPID MONOLAYER, SELF- ASSEMBLING PROPERTIES AND TRANSFECTION ACTIVITY OF NOVEL CATIONIC AMPHIPHILIC 1,4-DIHYDROPYRIDINE DERIVATIVES

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Keywords. Cationic 1,4-dihydropyridines; Lipid monolayers; Self-assembling properties; Nanoparticles; Dynamic light scattering; Transfection

Objectives. Nanoparticle-forming cationic amphiphilic 1,4-dihydropyridines (1,4-DHPs) have been the subject of interest in the field of nucleic acid delivery for decades. These compounds have low immunogenicity and cytotoxicity, making them promising non-viral vectors for nucleic acid delivery to the target cells. The challenge of improving transfection efficiency, however, still necessitates the synthesis of new cationic 1,4-DHPs. The current study aimed to evaluate the lipid monolayer, self-assembling properties, and transfection activity of a series of novel N-benzyl cationic amphiphilic 1,4-DHP derivatives.

Materials and Methods. Five cationic N-benzyl 1,4-DHPs with different substituents at the pyridinium moieties at positions 2 and 6 were synthesized in Latvian Institute of Organic Synthesis. The properties of the monolayers were characterized according to the surface pressure–molecular area isotherms, obtained using KSV NIMA Langmuir trough. Ethanolic solutions of 1,4-DHPs were jet-injected into aqueous media and their self-assembling properties were evaluated with dynamic light scattering. Green fluorescent protein expressing plasmid was loaded into 1,4-DHP liposomes and transfection efficiency was assessed in vitro using fluorimetry. Lipofectamine served as a positive control, while untreated cells were used as a negative control. Cytotoxicity was determined with the MTT assay.

Results. The mean molecular area of the analyzed cationic 1,4-DHPs varied from 131 Å² to 191 Å². The compounds formed nanoparticles with average hydrodynamic diameters ranging from 660 to 1973 nm. Polydispersity indices were in the range of 0.06 to 0.64. Zeta-potential varied from 35.7 to 90.9 mV. Critical micelle concentrations of 1,4-DHPs ranged from 0.006 to 2.646 µM.

Conclusions. The lipid monolayer characteristics, self-assembling properties and transfection activity strongly depend on the structure of the analyzed compounds. Introduction of N-substituent at 1,4-DHP and substituents at the pyridinium moieties of cationic head-groups will be discussed from the perspective of structure-activity relationships.

IDENTIFICATION AND CHARACTERIZATION OF ELDERBERRY EXTRACTS USING CHROMATOGRAPHIC AND SPECTROSCOPIC FINGERPRINTING METHOD

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Keywords. Elderberry; Herbal extract; Fingerprinting; Polyphenols; HPLC; TLC; FTIR; Adulteration

Objectives. Richness in various polyphenols and vitamins gives elderberry immune system strengthening, anti-inflammatory, and antioxidant activities. With its wide therapeutic spectrum and in today's pandemic its popularity has increased immensely. As the demand increases, also economically motivated adulteration is escalating, making elderberry dietary supplements vulnerable to counterfeiting with cheaper berries/fruits. Therefore, the chemical fingerprinting method could be used to determine the pureness of the product as quickly and efficiently as possible. The aim of the research was to obtain chemical fingerprints of elderberry and elderflower extracts and four other visually similar herbal extracts and to determine if the developed method is suitable for the identification and characterization of these medicinal plants.

Materials and Methods. At least 3 different samples from each medicinal plant – *Sambucus nigra* (flowers, berries), *Vaccinium macrocarpon* (berries), *Vaccinium myrtillus* (berries), *Vaccinium corymbosum* (berries), *Hibiscus sabdariffa* (calyces) – were collected and extracted using the maceration method in triplicate. Twelve polyphenols were used as reference standards. To obtain fingerprints high-performance liquid chromatography with a UV detector (HPLC – UV) at 3 different wavelengths – 280 nm, 360 nm, and 520 nm, thin-layer chromatography (TLC), and Fourier-transform infrared spectroscopy (FTIR) were used. Statistical analysis was performed using SpectraGyph 1.2.14, SpecAlign, Origin 10, SIMCA 14 software.

Results. Chlorogenic acid, caffeic acid, and rutin were detected in all medicinal plant samples. In addition, elderflowers contain kaempferol and apigenin – 7 – glucoside, but elderberries – quercetin. In principal component analysis, analysed medicinal plants formed compact, separate clusters. HPLC fingerprint similarity can be greatly improved by adjusting retention times to the average chromatogram of each medicinal plant.

Conclusions. Chemical fingerprints are a promising, quick, and efficient method that can be used for medicinal plant characterization, as well as a tool for the identification of possible medicinal plant adulterations.

DEVELOPMENT AND EVALUATION OF ETHOSOMES: POSSIBILITIES OF ENCAPSULATING MEDICINAL PLANT EXTRACTS

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Keywords. Ethosomes; Herbal extracts; Anti-oxidants; Wound healing; Blueberries; Transdermal drug delivery

Objectives. Foot ulcers are the most common complications among the patients suffering from diabetes mellitus. Wherein, the wound healing is interrupted, as well as delayed due to elevation in oxidative stress level. The blueberries (BB) are known for their anti-oxidant potential to treat diabetic ulcers and promote wound healing process. However polyphenols, main active constituent present in BB are highly unstable at different temperature, light, pH conditions, which limits their applications at biological level. The ethosomes have remarkable deformability and could be potentially suitable candidates for transdermal delivery of the BB. In this study, the ethosomes containing BB have been designed and were subjected to various physical and chemical characterization parameters.

Materials and Methods. The multi-lamellar vesicles along with different compositions have been fabricated via cold method. The finalized formulations have been characterized for average vesicle diameter (VD), polydispersity index (PI), zeta potential (ZP) using photon correlation spectroscopy. Moreover, percentage encapsulation efficiency (%EE), release kinetics were monitored via ultracentrifugation and HPLC method. Further, X-ray diffraction (XRD) and Fourier-transform infrared spectroscopy (FTIR) studies have been conducted. Finally, the anti-oxidant activity of BB present in both encapsulated and free solution form was assessed by (2,2-diphenyl-1-picryl-hydrazyl-hydrate) assay.

Results. The negatively charged lipid vesicles loaded with BB possess average VD of 180 nm with PI less than 0.3 which shows mono-modal dimensional distribution. Ethosomes were physically stable without undergoing any variation in the dimensions during the storage time. The BB content in vesicles was almost quantitative. The FTIR and XRD studies evidenced the amorphous state of BB encapsulated within the vesicles.

Conclusions. The BB containing ethosomes have been designed successfully. The obtained preliminary results demonstrate that the ethosomes have not only preserved the anti-oxidant activity, but also enhanced overall stability of BB extract throughout time.

SYNTHESIS AND CHARACTERIZATION OF NOVEL AMPHIPHILIC CATIONIC 1,4-DIHYDROPYRIDINE DERIVATIVES

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Keywords. Nanoparticles; Cationic 1,4-dihydropyridines; DLS

Objectives. Various cationic 1,4-dihydropyridine (DHP) derivatives have been studied in recent years for liposome preparation, due to their suitable chemical and biological properties. Fluorescent nanoparticles would enable their easy detection/movement tracking, which could be very useful for studying them in vitro and in vivo. The aim of this study was to synthesize novel 1,4-DHP derivatives with different substituents at position 4 and various cationic moieties, including fluorophoric ones, at positions 2 and 6, and evaluate their properties in order to determine their suitability for nanoparticle production.

Materials and Methods. 1,4-DHP amphiphiles were synthesized according to previously published methods (Pajuste et. al. 2013). The structures and purity of new compounds were confirmed using NMR spectra, and high-resolution mass spectrometry. The fluorescence of compounds was characterized using spectrofluorometry. Liposomes were prepared at concentration of 0.1 mmol/L, using ethanol injection method. (Charcosset et. al. 2015) The properties of liposomes were characterized, using dynamic light scattering (DLS) measurements (diameters of particles and polydispersity index (PDI)).

Results. A set of new cationic 1,4-DHP derivatives were synthesized via a multi-step procedure, with yields ranging from 16% to 73%. DLS measurements were used to characterize the liposomes and their stability. Most samples contained at least 2 distinct fractions of particles. The diameters of particles in freshly prepared samples ranged from 10 to 490 nm, while PDI values ranged from 0.254 to 0.514. After 5 days of storage particle diameters ranged from 20 to 437 nm, and PDI values ranged from 0.220 to 0.476.

Conclusions. The structure of the cationic substituents in 1,4-DHP amphiphile molecules affects properties of nanoparticles formed by them. Several of the compounds were able to form homogenous nanoparticles that were stable for at least 5 days. Further studies are required to determine the long-term stability of the nanoparticles, and to further characterize fluorescence of the compounds.

INCIDENCE OF GASTROINTESTINAL SIDE EFFECTS IN ADULTS TAKING ANTIDEPRESSANTS

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Keywords. Antidepressants; Depression; Gastrointestinal; Side-effects

Objectives. The use of antidepressants for adults increases by each year. With the positive effects of antidepressants, come a variety of gastrointestinal side-effects. The goal of the research is to determine the side effects of first-line depression therapy medications and what are the most used over-the-counter medications in Latvia that can be used to reduce side effects, as well as to assess the antidepressant group that has the least side effects.

Materials and Methods. The most common side effects were analyzed through existing data in the patient information leaflets of first-in-use antidepressants used and registered in Latvia. An anonymous survey was made for patients to find out what side effects they faced and the management of them.

Results. Selective serotonin reuptake inhibitors seem to have less risk and take a smaller toll on the gastrointestinal tract by existing research, but the survey showed the opposite – SSRI's often caused a variety of side-effects.

Conclusions. It is hard to determine an antidepressant with the least gastrointestinal side effects, due to each of the groups having its specific more prominent side effect, as most patients experienced nausea regardless of the therapy.

DIFFERENT POLYMER IMPACT ON EXTRACELLULAR VESICLE ISOLATION PROCESS IN NOVEL SEPARATION DEVICE

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Keywords. Extracellular vesicles; Microfluidics; PDMS; OSTE; NTS

Objectives. Extracellular vesicles (EV) are a class of small, membrane-bound structures that are released by cells and play critical roles in intercellular communication and promising diagnostic and therapeutic tool. However, the isolation of EVs from large volume samples remains a significant challenge due to their small size and low concentration. We aimed to evaluate the impact of different polymers suitable for mass manufacturing in comparison to PDMS widely used for microfluidic solutions on EV isolation process using a simplified one-channel microfluidic device as a part of a novel EV separation method.

Materials and Methods. A pressure system was employed to ensure consistent fluid flow in single-channel devices. This enabled precise quantification of EV loss in single-channel devices. EV samples were prepared through dilution, passed through the channels, and analyzed using a Nanosight NS300 instrument (NTS). The percentage of EV recovery was calculated using data from the samples and blank controls.

Results. In this study, OSTE-COC polymer single-channel devices were compared to PDMS devices using a pressure of 100 mBar. EV dilutions were made in the upper working range of the NTS, and seven biological replicates were conducted. The average recovery of EVs from OSTE-COC devices was 66.3%, with a variability of 27.3%, while the average recovery from PDMS devices was 108.3%, with a variability of 53.6%. The results indicated that OSTE-COC devices had lower variability than PDMS devices and did not produce additional particles in the expected EV size range. However, further experimentation is necessary to confirm that the increased particle amount in PDMS devices is due to material leakage.

Conclusions. Combination of OSTE-COC polymers outperforms PDMS in terms of additional particle generation that is not EVs and potentially can be used in EV isolation device manufacturing since these polymers are suitable for mass manufacturing methods.

PHYTOCHEMICAL SCREENING AND DETERMINATION OF ANTIBACTERIAL ACTIVITY OF VACCINIUM MYRTILLUS AND VACCINIUM CORYMBOSUM EXTRACTS

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Keywords. Vaccinium myrtillus, Vaccinium corymbosum, antibacterial activity, polyphenols, phenolic acids, flavonoids

Objectives. Medicinal plants and their preparations have been used for centuries both as a prophylactic and therapeutic tool against various health problems. The use of medicinal plants in evidence-based medicine is based on their phytochemical composition. Vaccinium genus plants are one of the richest natural sources of polyphenols, therefore potentially having antimicrobial activity. Although the antimicrobial activity and phytochemical profile of the Vaccinium genus plant Vaccinium oxycoccus (cranberry) have been widely discussed in the literature, currently the data available on 2 other species of this genus – Vaccinium myrtillus (bilberry) and Vaccinium corymbosum (highbush blueberry) isn't sufficient and unambiguous. This research aimed to investigate the chemical composition of bilberry and highbush blueberry extracts of Latvian origin and to determine their antimicrobial activity.

Materials and Methods. A total of 13 berry samples were collected and extraction using maceration was carried out in triplicate for each sample. Fourier transform infrared spectroscopy, UV/VIS spectroscopy, high-performance liquid chromatography, and thin-layer chromatography methods were used to determine the phytochemical composition. Antimicrobial activity was determined against two bacterial strains – S. aureus (Gr+) and E. coli (Gr-).

Results. Data shows that the total polyphenol content in blueberry genus plants varies from 20.06 mg gallic acid equivalent/g lyophilized extract (Vaccinium corymbosum) to 57.11 mg gallic acid equivalent/g lyophilized extract (Vaccinium myrtillus). The dominant phenolic acid in both species were chlorogenic acid, but significant differences in concentrations were observed between these species. Dose-dependant growth-inhibitory effects of extracts against S.aureus and E.coli were observed.

Conclusions. Fruits of studied species of the blueberry genus contain a high amount of polyphenols and their extracts show antibacterial activity against both S.aureus and E.coli bacterial strains. Further research into the potential applications of the fruits of these species in evidence-based medicine is needed.

SODIUM ALGinate – A PROMISING MATRIX FOR THE DELIVERY OF MEDICINAL PLANTS EXTRACTS

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Keywords. Sodium alginate; Beads; Films; Echinacea purpurea; Melissa officinalis; Drug delivery system

Objectives. Phytopharmaceutical preparations are starting to play an increasingly important role in modern evidence-based medicine due to their wide spectrum of action. However, often their bioavailability is limited, and major investments have been made in the development of drug delivery systems that encapsulate medicinal plant extracts. Sodium alginate is one of the most popular and widely researched materials used to create hydrogels and deliver active substances of various origins. The aim of this work was to evaluate the possible encapsulation of lemon balm (*Melissa officinalis*) and purple coneflower (*Echinacea purpurea*) extracts in sodium alginate films and beads and to determine their properties.

Materials and Methods. Sodium alginate solutions with extracts were prepared at 1, 5, 10 and 25% concentrations with the addition of glycerol as a plasticizer and calcium chloride hexahydrate as a crosslinking agent. Total polyphenol content (TPC) before and after encapsulation was determined using the Folin-Ciocalteu method, while phytochemical analysis of extracts was performed by high-performance liquid chromatography (HPLC) and high-performance thin-layer chromatography (HPTLC). Fourier transform infrared spectroscopy (FTIR) was used to obtain and analyze the spectra of films and beads.

Results. Alginate films with an average diameter of 8 cm \pm 0.2 cm and thickness of 3 mm and beads with an average diameter of 3 mm with encapsulated extracts were obtained. No new bands in FTIR spectra of films with extracts compared to empty alginate films were observed, indicating no interaction between the extracts and alginate. A positive correlation between herbal extract concentration in films and the TPC of films was observed.

Conclusions. Sodium alginate films and beads incorporated with plant extracts maintain a high concentration of active substances, and show no interactions between material and extract, making it a promising matrix for the delivery of medicinal plant extracts.

NEW STYRYLPYRIDINIUM DYES – SYNTHESIS, EVALUATION OF THE PHYSICO-CHEMICAL, SELF-ASSEMBLING AND BIOLOGICAL PROPERTIES

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Keywords. Styrylpyridinium derivatives; Self-assembling properties; Nanoparticles; Dynamic light scattering; Fluorescent properties

Objectives. Styrylpyridinium salts are widely studied both as imaging agents for biochemical, biophysical, molecular biology applications due to fluorescent properties [Dubur et al., 1984, Xu et al., 2015] and as prospective compounds with biological properties, for example antimicrobial activity [Vaitkiene et al., 2020]. The development of new compounds with desirable photophysical properties is a challenge for the researchers working in this field. The aim of the study was synthesis and evaluation of physical, self-assembling and biological properties of new styrylpyridinium derivatives.

Materials and Methods. Styrylpyridinium derivatives were synthesized from the appropriate aldehydes and 4-picolinium salts according to Vaitkiene et al [Vaitkiene et al., 2020] or from appropriate aldehydes and 4-picoline [Lorance et al., 2002] with following quaternization. Dynamic light scattering method was used for self-assembling estimation; samples were prepared by tin film hydration method as aqueous solutions [Pajuste et al., 2013]. Cytotoxicity of compounds in vitro was assessed by the MTT test on tumor cell lines – HT-1080 and MH-22A and normal mouse fibroblasts 3T3 [Strokes et al., 2008]. Fluorescent microscopy was used to analyze cell fluorescence.

Results. Set of original styrylpyridinium dyes with structure variations was obtained using two above described approaches. Nanoparticles with the average size around 120 nm were formed by freshly prepared samples. The tested compounds show an intensive fluorescence, especially in lipophylic medium. The some of styrylpyridinium dyes possessed significant selective antiproliferative activity in cancer cell lines (HT-1080; MH-22A) together with low cytotoxicity in noncancerous NIH3T3 cells. Fluorescent microscopy of cells preincubated with some compounds revealed an intense red fluorescence monitored within at least 5 days of cultivation. Structure-activity relationships will be discussed.

Conclusions. Structure variation in the synthesized compounds strongly affects the properties of the tested styrylpyridinium derivatives.

HIGH HYDROSTATIC PRESSURE APPLICATION FOR THE INACTIVATION OF E. COLI AND ESBL BACTERIA

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Keywords. Sterilisation; High hydrostatic pressure sterilisation (HHP); Biomedical application; Antibacterial properties; Artificial intelligence assisted design of experiment (AI/ML DoE)

Objectives. High hydrostatic pressure (HHP) sterilisation method is widely applied in the cosmetics and food industry and recently it has been applied in the sterilisation of biomaterials (hydrogels) for medical applications. HHP benefits from a low-temperature load, applicability to liquid/gel-like materials, and preservation of unstable structures. Pressure treatment of microbial cells induces many changes in the bacterial cell, including inhibition of key enzymes and protein synthesis, alterations in cell morphology and membrane, affecting the genetic mechanisms (disruption of transcription and translation and cellular functions responsible for survival and reproduction). The aim of this study was to develop optimal sterilisation conditions (time, pressure, cycle oscillation) by advanced artificial intelligence assisted design of experiment strategy (AI/ML DoE) and to determine sterilisation efficiency against Gram-negative (*E. coli* and ESBL) bacteria.

Materials and Methods. In this study, HHP sterilisation treatment in different conditions: time (5–15 min), pressure (100–300 MPa), number of pressure cycles (1–3) and qualitative, quantitative microbiological testing were used to determine sterilisation efficiency against *E. coli* and ESBL bacteria. The AI/ML DoE strategy was used to understand the effects of specific independent variables and estimate interactions between them on the experimental response, with fewer experiments.

Results. Results confirmed the literature results that Gram-negative bacteria are less baroresistant than Gram-positive ones; showed a correlation between pressure, time and pressure cycles. Using AI/ML DoE tool allowed us to create a new hypothesis and enhance project tasks.

Conclusions. HHP sterilisation method has a good potential for being used to produce medical biomaterials, such as drug-loaded hydrogels, because compared to traditional thermal processing and several other sterilisation methods, HHP method is less energy consuming, not involving radiation emitted materials and it is not changing the chemical, physical and mechanical properties of material.

SOME DETAILS IN THE SYNTHESIS OF DIHYDROPYRIMIDINES

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Keywords. Monastrols; Ionic liquids; Eutectic solvents; Dihydropyrimidines

Objectives. Since they play an important role in human life, their use in the field of drug research has stimulated the expansion of the range of synthetic methods of synthesis, availability in the laboratory and their chemical transformations, especially in terms of respecting the protection of ecology and encouraging environment. The last period of time is marked by a significant increase in the number of publications about chemicals from the group of 3,4-dihydropyrimidines obtained by condensation under the conditions of the Biginelli reaction. This fact is due not only to the availability of obtaining 3,4-dihydropyrimidine derivatives, but also to their manifestation in different ranges and directions of pharmacological activities: be analgesic, anticancer, antiparasitic, antibacterial, antiviral, antihypertensive, antifungal, etc. The relevance lies in the search for a certain compound from the pyrimidine family. Biological activity is manifested by different pharmacophore fragments in their constitutive structures. The field of application of 3,4-dihydropyrimidines was enriched with a new substance, found through the synthesis of a bioactive derivative of 3,4-dihydropyrimidine-2-(1H)-thione from the dihydropyrimidine family, known as monastrol. Monastrol has shown results in different directions of biological activity.

Materials and Methods. Monastrols, ionic liquids, eutectic solvents, dihydropyrimidines, Biginelli reaction.

Results. Many products of the dihydropyrimidine series also exhibit biological activity as racemates. One of the important products of a three-component reaction under the conditions of the Biginelli reaction is a substance, so-called, oxymonastrol (ethyl-6-methyl-4-(3-hydroxyphenyl)2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxyl).

Conclusions. The role of pyrimidine derivatives in various processes of human life is well known, the most important of which is the transmission of hereditary information. The pyrimidine ring and its oxohydrogenated forms form the structural basis of the nitrogenous bases of nucleic acids, as well as a number of natural and synthetic drugs.

EFFECT OF CONDITIONS AND ADDITIVES ON CRYSTALLIZATION OF NICOTINAMIDE POLYMORPHS

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Keywords. Nicotinamide; Polymorphism; Crystallization; Crystallization additives

Objectives. Nicotinamide (NA) is a form of vitamin B₃ that has a variety of potential therapeutic uses, such as anti-inflammatory effect and neurological dysfunctions treatment. It has nine polymorphic forms. Polymorphism has an impact on the solubility, and bioavailability, but NA metastable forms have been crystallized only with melt crystallization.

Materials and Methods. In this study, the additive crystallization control approach was used to investigate the crystallization of NA. The crystallization of NA was studied under various conditions by cooling and evaporative crystallization with different solvents. The effect of various additives with different intermolecular interaction possibilities was tested on the crystallization of NA from 1,4-dioxane and acetonitrile. Each crystallized product was analysed by powder X-ray diffraction (Bruker D8 Advance). Geometry optimization of the crystal structures was performed in Quantum Espresso 6.4.1., but full geometry optimization of the NA molecule and geometry optimization with the torsion angle of the amide group constrained to the values as present in the crystal structures in the gas phase were performed in Gaussian 09 with the density functional theory M06-2X and 6-31++G(d,p) basis set. Calculations of pairwise intermolecular interaction energy in crystal structures were performed in CrystalExplorer 21 at the B3LYP-D2/6-31G(d,p) level. The lattice energy was calculated by summing the intermolecular energy and the intramolecular energy.

Results. Phloroglucinol was found to have the ability to promote a new crystalline phase formation. Meanwhile, 2-picolinic acid was found to enhance the crystallization of form II from acetonitrile.

Conclusions. Metastable forms of NA have not been obtained by crystallization from the solution, except in the presence of some additives, as approved in this study.

ANTIOXIDANT ACTIVITY AND BIOACTIVE COMPOUNDS OF CANTHARELLUS CIBARIUS MUSHROOM EXTRACTS

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Keywords. Cantharellus cibarius; Antioxidants; Bioactive compounds; Determining antioxidant activity; Mushroom

Objectives. The aim of this study was to assess the antioxidant activity of different golden chanterelle extracts, its relation to bioactive compounds in mushrooms, and to compare them between each other. Cantharellus cibarius or golden chanterelle is a common mushroom in European region, including Latvia. It's been used in folk medicine for centuries, but not in evidence-based medicine, even though nowadays there are available research papers that suggest golden chanterelle can be used in some cases, for example, as a wound healing, anti-inflammatory or even as a cancer prophylactic agent.

Materials and Methods. Three different mushroom groups: fresh (I group), dried in low temperature (II group) and lyophilized (III group) were analyzed. In each group, methanol, aqueous ethanol (60%) and phosphate buffered saline (PBS) extracts of golden chanterelle fruiting bodies, growing in Latvia in different regions, were prepared. Each group was tested for their antiradical activity, reducing power, total polyphenolic content (TPC), and beta-carotenoids content. Antioxidant capacity was measured using ABTS and FRAP assay, total phenolic content was tested using Folin-Ciocalteu method, and beta-carotenoids were determined by spectroscopy. Results were expressed per 1 gram of mushroom's bodies. Data were analyzed using Microsoft® Excel® standard program.

Results. PBS extracts showed better antioxidant capacity and contained more polyphenolic compounds compared to other extracts. Antioxidant activity and TPC was higher in extracts from II group compared to other groups. Beta-carotenoids were detected only in methanol extract (about 5.2 mg/100 g). Extracts displayed weak correlation between TPC and antioxidant activity.

Conclusions. Golden chanterelle extracts contain measurable amounts of bioactive compounds and antioxidants. Phosphate buffered saline extract of golden chanterelle demonstrated the best properties for being used as antioxidant; drying is the preferred method of preparing sample to study antioxidant activity according to our results.

CHARACTERIZATION OF TRACE ELEMENT VARIABILITY IN CORNFLOWERS AND SOIL BY ICP AND XRF METHOD

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Keywords. Multielement analysis, ED-XRF, ICP-MS, screening analysis

Objectives. The chemical composition of plants is affected by several factors: soil composition and the ability to assimilate, accumulate and transfer elements. Plant multielement is a valuable tool for evaluating the environmental situation and their growing, harvesting and storage conditions. In this study, we demonstrate using two analytical multielement techniques, ICP-MS and ED-XRF. This study aimed to evaluate the application of ED-XRF and ICP-MS methods in plant and soil analysis using cornflowers as a test object.

Materials and Methods. In this study, three cornflower *Centaurea cyanus* samples (roots, leaves, stems, and flowers) and corresponding soil from three regions of Latvia (Smiltene, Jēkabpils, Tukums) were analyzed using ICP-MS and ED-XRF methods. ICP-MS and ED-XRF methods were chosen because both are widely used multielement analysis methods. ICP-MS is a destructive method that implies a digestion and dissolution process. Furthermore, the ED-XRF is a non-destructive method with minimum sample preparation.

Results. By the ICP-MS method were detected 19 metallic and two non-metallic (P and Se) elements, but with an ED-XRF, 13 metallic and six non-metallic (Br, Cl, Si, S, P, Se) elements. The obtained data showed that Al, P, Ca, Fe, and Mg accumulate the most in flowers, K and Ca accumulate in leaves. Results show the importance of sample preparation for herbal samples, specifically sand particles from the soil influence element concentrations in roots. The lowest sensitivity of XRF limits of its usage for low-concentration heavy elements, and a detectable concentration of them is observed in the 5 µg/kg range.

Conclusions. This work demonstrates the limitations and possibilities of the ICP-MS and ED-XRF methods. The results were affected by the sample preparation method. Recommendations for sample preparation and effective use of the methods were prepared.

COMPARISON OF MEDICINE INFORMATION GIVEN BY PATIENTS WITH THE ELECTRONIC PRESCRIPTION DATABASE

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Keywords. Medicine; Polypharmacy

Objectives. Polypharmacy is a rising global factor because people live longer and receive long-lasting treatment for chronic diseases. Patients visit multiple specialists receiving various recommendations and do not consider it essential to discuss every receiving medication and food supplement with every physician. Today, we have an electronic prescriptions database (E-veselība) providing information about prescribed medicines for patients. The study aimed to check that patients' information about their currently used prescription medications matches the data in the prescriptions database.

Materials and Methods. This cross-sectional study was conducted at Pauls Stradins Clinical University Hospital, Riga, Latvia, from March to December 2022. Respondents were patients undergoing electric cardioversion and using one of the direct oral anticoagulants. The data was collected through a face-to-face survey, including questions about patients' demographics and currently used medication therapy. IBM SPSS Statistics 27.0 descriptive statistics were used to measure and calculate frequencies, percentages, means, and standard deviations. For group comparison, chi-square tests were used.

Results. A total of 81 respondents participated in the survey, of whom 30 (37.0%) were women. Respondents used 7.9 ± 3.0 active substances as prescription medicine simultaneously. Sixty-five (80.2%) patients were using 5 or more active ingredients. Also, 39 patients (48.1%) provided information that did not match the prescriptions database, and most often, patients ($n = 20$, 51.3%) encountered a problem telling the correct dose. More than half ($n = 42$) of patients did not note medicines indicated in the electronic prescription database. The most frequent unmentioned pharmacological groups of 90 cases were: 1) vitamins ($n = 9$), 2) benzodiazepines ($n = 6$) and 3) HMG-CoA reductase inhibitors ($n = 4$). It was observed that people living alone tended not to mention all electronically prescribed medications ($p = 0.040$).

Conclusions. Discrepancies were present in about every second case. Healthcare specialists should ask and trust patients talking about their used medications but should also cross-check the information to avoid potential drug interaction risks.

REPRODUCIBILITY AND ACCURACY OF FACIAL SOFT TISSUE LANDMARKS IN ANGLE CLASS II PATIENTS USING THREE-DIMENSIONAL STEREOPHOTOGRAMMETRY

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Keywords. 3-D stereophotogrammetry; Orthodontics; Class II; Reproducibility; Accuracy; Computer-assisted three-dimensional imaging

Objectives. The aim of this study was to evaluate reproducibility and accuracy of 21 facial soft tissue anthropometric landmark positions between the student and the orthodontist in class II patients using three-dimensional stereophotogrammetry.

Materials and Methods. Twenty-five 3D images were taken in class II patients using 3dMD stereophotogrammetry equipment. 21 facial soft tissue landmarks were identified in a 3dMD Vultus software. All images were analyzed twice by 2 observers with an interval of 2 weeks to determine intra- and interobserver accuracy and reproducibility. Intraexaminer marking differences were calculated and classified as < 0.5 mm, 0.5–1 mm and > 1 mm. Intraclass correlation coefficient was used to find out the reliability of the landmark identification and box plots were used to determine differences in examiners anatomical point marking.

Results. The mean intraexaminer difference for examiners 1 and 2 was 0.37 mm and 0.30 mm, respectively. The mean interexaminer difference was 0.34 mm ($p = 0.6963$). Three points (GlabY, ALRZ and PogoY) for examiner 1 presented a point difference of > 1 mm, however, for the second examiner all points produced a difference of < 1 mm. For the first examiner the highest reproducibility was for the GlabZ point (0.08 mm) and for the second examiner PnonZ point (0.08 mm). For the first examiner the lowest reproducibility was for the PogoY point (1.38 mm) and for the second GlabY point (0.58 mm). For the first examiner the range of point marking was 0.22–0.49 mm, for the second 0.21–0.36 mm. ICC range was 0.92 (95%, 0.40–0.99).

Conclusions. The facial soft tissue anthropometric landmarks were shown to have high accuracy for both examiners. The range of point marking for both examiners was statistically insignificant. The student was less accurate than the orthodontist and the range of point marking for the student was larger.

THE RELATIONSHIP BETWEEN SKELETAL AND JAWBONE MINERAL DENSITY IN POSTMENOPAUSAL FEMALES

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Keywords. Cone beam computed tomography (CBCT); Bone mineral density (BMD); Osteoporosis; Postmenopausal female; Edentulous; Jawbone

Objectives. To evaluate the impact of reduced general bone mineral density (BMD) on the grey values (GVs) of the edentulous jawbones in postmenopausal females.

Materials and Methods. In the present study were included 64 edentulous females aged 54–87 years (mean age 70.4 ± 8.4 y) who underwent cone beam computed tomography (CBCT) examinations due to dental implant planning. BMD measurements were made by dual energy X-ray absorptiometry (DXA) in the region of lumbar spine and both femoral necks. The worst T-score reading from both were taken into account and patients were divided into 3 groups: normal BMD (T-score ≥ -1.0), osteopenia (T-score < -1.0 to -2.5) and osteoporosis (T-score ≤ -2.5). The analyze of CBCT images was made with OnDemand3D Dental software. Four different cross-sectional areas of the jaws were selected to determine average GV. Measurements were made with 10x20mm region of interests (ROI) in the mandible and 10x15 mm ROI in the maxilla, in the middle of relevant cross-sectional images. Measurements were made by 2 observers with two attempts. Difference between groups was evaluated by ANOVA. Pearson correlation was used to determine correlation between GV and age. Measurement agreement was determined by Cronbach's alpha test.

Results. There were 18 patients with normal BMD (mean age 70.39 ± 9.3 y), 28 patients with osteopenia (70.29 ± 8.23 y) and 18 patients with osteoporosis (70.56 ± 8.2 y). Statistically significance between groups by age was not found ($p = 0.995$). The lowest GV were found in osteoporosis group compared to other groups, however, no statistically significant difference was found. Weak negative correlation was found between age and the mandibular first molar region GV measurements ($r = -0.289$, $p = 0.021$). Intraobserver and interobserver agreements were from acceptable to excellent, respectively ($0.71 \leq \alpha \leq 0.96$) and ($0.68 \leq \alpha \leq 0.9$).

Conclusions. There was found no relationship between general BMD and GV of the jaw bones in postmenopausal females.

USEFULNESS OF VIRTUAL SIMULATORS IN IMPROVING PRACTICAL SKILLS AND RESULTS IN TOOTH PREPARATION AMONG DENTAL STUDENTS

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Keywords. Virtual reality; Simulators, haptic simulator; Haptic technology; Force feedback; Preclinical dentistry; Motor skills

Objectives. Development of psychomotor skills makes up a significant part of the dental education. Aim of this study was to find out whether the use of virtual reality simulators (VRS) helped to improve practical skills and results in typodont tooth preparation among dental students.

Materials and Methods. Sixty five 2nd year of the Faculty of Dentistry of Riga Stradins University (31 international and 34 latvian students; 28 males and 37 females) students were included. All of students trained on phantoms and took exam at the end of semester, where they prepared teeth (dd 36; 35) for crown. In addition, students had to perform tasks on VRS (Simodont dental trainer, Moog Industrial Group) and time spent by the students on the simulator drilling cavities, boxes, crown preparation and total time on the VRS was calculated. Crown-prepared plastic teeth were evaluated by one observer twice with an interval of two weeks. The obtained results were analyzed using t-test.

Results. Students who spent more time on the simulators overall (more than 100 minutes) managed to get statistically significant higher score (9.34 points of 16) on the plastic tooth crown preparation compared to those who practiced less (8.25 points) ($p = 0.045$). There was no statistically significant difference in time spent drilling cavities, boxes, crown preparation and results in plastic teeth preparation. It was observed that female students got statistically significant higher score (9.32 points) on the plastic tooth crown preparation compared to males (8.19 points) ($p = 0.039$). There was no statistically significant difference in results of plastic teeth preparation between international and Latvian students.

Conclusions. Use of VR simulators is useful tool in the development of practical skills and improving the results of crown preparation, regardless of the type of the tasks performed.

RELATIONSHIP BETWEEN PERSONALITY FACTORS AND COOPERATION LEVEL OF ADULT PATIENTS DURING INVISALIGN TREATMENT. A PILOT STUDY

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Keywords. Big Five Inventory; Patient cooperation; Invisalign treatment; Treatment outcomes

Objectives. Patient cooperation level is a crucial factor for orthodontic treatment success. There is no clear evidence how personality traits affect patients' cooperation during the orthodontic treatment with clear aligners. The aim of this study was to assess the relationship between the personality traits of an adult patient and cooperation level for treatment with aligners.

Materials and Methods. This prospective cohort study evaluated 22 patients, who were in orthodontic treatment with Invisalign clear aligners. Patients personality traits were assessed through the validated Big Five Personality Inventory (BFI) analogue test in the Latvian language (V.Perepjolkina et al., 2014). BFI, intraoral scanning and general data questionnaire were administered at 6 months of the treatment. Patient cooperation was assessed by evaluating clinical fitting of aligners to dental arches and comparison of the planned and achieved upper 1st premolar expansion movement (%). Premolar expansion $\leq 60\%$ and/or aligners did not fit in more than one sextant, considered as insufficient motivation level. Assessments of compliance were performed at 6 and 12 months of the treatment. Questionnaire and scan results were compared with BFI test results by non-parametric statistical analysis. Data were analyzed in the SPSS. P-value less than 0.05 considered reliable.

Results. 12 patients were cooperative and 10 patients compliance level was considered insufficient. Noncompliant patients had higher scores for neuroticism ($p = 0.04$). Neuroticism was associated with increased number of missed appointments, non-correspondence of the actual aligner number and planned aligner number, inability to control the financial level. The neuroticism level negatively correlated with the achieved movements of the upper premolars ($r = -0.49$, $p < 0.05$). Higher scores in extraversion were associated with complaining about treatment and worse hygiene scores. Higher scores in conscientiousness were associated with ability to control financial level and parents participation in the treatment process. Openness was positively correlated with desire to inform family about the start of the treatment. Neither of personality traits were correlated with other extrinsic motivation factors.

Conclusions. The increased levels of neuroticism were more often seen in non-compliant patients.

CHARACTERISTICS OF CARIOUS LESIONS IN INTERNALLY DISPLACED UKRAINIANS

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Keywords. Carious; Stress; War impact; Internally displaced persons; Ukraine

Objectives. Since the extreme impact on the body is not the last in the list of factors that cause tooth decay, the undeniable burden of the war, which affects Ukrainians, is also reflected in the state of the hard tissues of the teeth. The basis of our study was the question of the characteristics of the hard tissue lesions of the teeth in internally displaced persons (IDP) – those people who were forced to leave their homes and move to other regions of our country due to threats from the aggressor. The subjects of the study were 29 IDP residing in the territory of the Poltava Territorial Community who applied for dental care.

Materials and Methods. For all examinees DMF-index, OHI-S by Green-Vermillion and SiC-index were determined. Additionally, dispositions D, M and F were evaluated separately.

Results. The prevalence of odontopathology in IDP is 100%, which corresponds to a similar indicator for the adult population of Ukraine. The DMF-index of IDP was 10.9 ± 1.33 , which is 5 times higher than the DMF index for the population of Ukraine on average (Moreira R., 2012). At the same time, the results of dispositions D, M and F revealed approximately the same distribution of carious lesions in internally displaced Ukrainians. The results for disposition D were 3.41 ± 0.55 , for disposition M 3.31 ± 0.82 , and for disposition F 4.03 ± 0.7 . OHI-S for the group of examined persons is 1.45 ± 0.08 , which corresponds to the average general level of oral hygiene care. SiC-index for IDP is 19.6 ± 0.86 . This value is very high and indicates significant damage of hard dental tissues in persons who suffered from war.

Conclusions. In internally displaced Ukrainians who were tormented from the extreme stressful effects of wartime, a significant and uneven damage to the hard tissues of the teeth is determined.

THE CONNECTION BETWEEN A CLEFT HARD PALATE WITH A CLEFT SOFT PALATE AND SPEECH DISORDERS

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Keywords. Cleft hard palate; Cleft soft palate; Speech disorders; Connection

Objectives. Cleft palate is one of the world's most common congenital anomalies and the most common malformation of facial development. Cleft is a defect that causes breathing, eating, hearing, speech and aesthetic disturbances in patients. The aim of the study was to explore the connection between the presence of speech disorders and a cleft hard palate with a cleft soft palate.

Materials and Methods. A quantitative non-experimental case study was performed, including 44 patients of both sexes who were registered at the Lip, Palate and Facial Cleft Centre of the Dentistry Institute of Rīga Stradiņš University from 2010 to 2020, and who were diagnosed with a cleft hard palate with a cleft soft palate. Patients' medical histories and speech recordings were examined. The Fisher's Exact Test and the Pearson Chi-Square Test were used for the analysis.

Results. Data showed a statistically significant relationship between hypernasality and nasal air emission in patients with a diagnosed cleft hard palate with a cleft soft palate ($p = 0.036$). There is a statistically significant relationship between the presence of a cleft hard palate with a cleft soft palate and cleft-related speech sound disorders ($p = 0.00$). A statistically insignificant relationship between cleft-related and non-cleft-related speech sound disorders has been shown ($p = 0.275$). Also, there was no statistically significant relationship between cleft hard palate with cleft soft palate and the hearing impairment. Statistically insignificant relationship was found between cleft palate type (incomplete/complete) and speech disorders ($p = 0.125$; $p = 0.242$; $p = 0.121$; $p = 0.363$).

Conclusions. There is a close connection between cleft hard palate and cleft soft palate, hypernasality and nasal air emission ($p = 0.036$). A close connection was found between cleft hard palate with cleft soft palate and cleft-related speech sound disorders (80%).

EFFECTS OF REDUCED BONE MINERAL DENSITY ON EDENTULOUS MANDIBULAR CORTICAL BONE

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Keywords. Osteoporosis; Cone-beam computed tomography; Bone mineral density; Mandible; Cortical bone

Objectives. Objective was to detect reduced bone mineral density (BMD) impact on mandibular cortical bone thickness in postmenopausal females.

Materials and Methods. In the present study 64 edentulous females were included (mean age 70.4 ± 8.4 y). They undertook cone beam computed tomography (CBCT) investigation (Next generation i-CAT) due to implant planning. Dual energy X-ray absorptiometry (DXA) was used to measure femoral neck and lumbar spine BMD. The worst T-score reading was included to divide patients into normal BMD, osteopenia and osteoporosis groups. In cross-sectional CBCT images, four areas of the mandible (lateral incisor, first premolar, first molar, foramina mentalis) were selected to determine vestibular, lingual and basal cortical bone thickness. One-way ANOVA was used for intergroup comparison. The agreement of measurements was evaluated with Intraclass Correlation Coefficient (ICC).

Results. Based on DXA results, normal BMD was found in 18 (mean age 70.39 ± 9.3 y), osteopenia in 28 (70.29 ± 8.23 y), but osteoporosis in 18 patients (70.56 ± 8.2 y), $p = 0.995$. Incisive and premolar vestibular cortical bone width in normal BMD group was the largest of all BMD groups: osteoporosis (1.26 ± 0.32 mm), osteopenia (1.36 ± 0.39 mm), normal BMD (1.79 ± 0.59 mm), $p = 0.001$; osteoporosis (1.40 ± 0.38 mm), osteopenia (1.42 ± 0.38 mm), normal BMD (1.76 ± 0.48 mm), $p = 0.013$. A reduced thickness of foramina mentalis basal cortical bone was found in osteoporosis group (2.63 ± 0.73 mm) when compared to normal BMD (3.09 ± 0.72 mm), $p = 0.039$. For these measurements ICC was found to be at moderate to high level (ICC = 0.50–0.83).

Conclusions. Postmenopausal females with reduced BMD showed reduced vestibular cortical bone thickness in incisor and premolar regions and basal cortical bone thickness in foramina mentalis region of mandible.

PREVALENCE OF SOFT TISSUE CALCIFICATIONS IN DENTAL PANORAMIC RADIOGRAPHS AMONG 40–70 YEARS OLD PATIENTS IN STOMATOLOGY INSTITUTE

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Keywords. Soft tissue calcification; Dental panoramic radiography; Tonsilloliths; Antrolith; Lymph node calcification; Carotid artery calcifications; Phleboliths; Ossification of the stylohyoid ligament; Sialoliths

Objectives. The correct interpretation of soft tissue calcifications is important in dental surgery practice, so it is crucial to carefully evaluate dental panoramic images. Soft tissue calcifications have not only local expressions, but also systemic effects, which can cause complications in other organisms or, conversely, signal the problems of other systems, therefore it is important to understand pathologies not only as local diseases, but also in relation to their potential systemic effects. The purpose of this study is to assess the frequency of calcification of a.carotis and other soft tissue in 40–70 years old patients who underwent a panoramic dental examination at the Stomatology Institute in September 2022.

Materials and Methods. panoramic radiographs were analysed obtained at the Stomatology Institute in September 2022 from 40–70 years old individuals of both sexes. The types of soft tissue calcifications evaluated were as follows: carotid artery calcification, sialoliths, tonsilloliths, antrolith, lymph node calcification, phleboliths, and ossification of the stylohyoid ligament. The presence of soft tissue calcifications was compared with age and sex. The chi-square test was used for the calculation of p values.

Results. Out of 238 patients (151 females and 87 males), 34 (14.3%) were determined to have carotid artery calcification when examined with panoramic radiography, but most common was lig.stylohyoideus ossification (n = 86, 36.1%). A.carotis calcification was more common for the 56–70 age group (n = 17; 19.5%), but less frequently for the 40–55 age group (n = 17, 11.3%).

Conclusions. In dental practice, it is important to be able to correctly interpret all calcifications in the facial and neck area, but the most important task is to diagnose and correctly interpret a.carotis calcification, as well as to timely transfer the patient to the appropriate specialist.

ORAL LEUKOPLAKIA – CAUSES, SYMPTOMS, TREATMENT, ASSOCIATIONS WITH ORAL CANCER

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Keywords. Oral leukoplakia; Erythroleukoplakia; Oral squamous cell carcinoma

Objectives. The purpose of the present retrospective research was to describe the association of oral leukoplakia and squamous cell carcinoma.

Materials and Methods. The research was designed as the analysis of a retrospective case series based on the data of the Maxillofacial Surgery Center of Pauls Stradins Clinical University Hospital. The present research comprises all oral leukoplakia and squamous cell carcinoma lesions, diagnosed in the period from 01.01.2017 till 31.12.2021 including. There were 19 patients, 10 of whom were females and 10 males, within the age range between 38 and 83. Author has examined the medical case reports of 19 patients.

Results. 52% of patients with oral leukoplakia were smokers. The most common localisation of oral leukoplakia – 38.5% of cases on the dorsal surface of the tongue, in 15.4% of cases oral leukoplakia has been localized in the base of oral cavity and as well on the buccal mucosa. 50% of squamous cell carcinoma of the oral cavity have been localized on the dorsal surface of the tongue.

Conclusions. Oral leukoplakia has multifactorial etiology. The frequency of malignancy of oral leukoplakia in patients of Pauls Stradins Clinical University Hospital is 28.6%.

CORRELATION ANALYSIS BETWEEN MORTALITY RATE OF PALATINE TONSIL CANCER AND RELATED FACTORS IN FINNISH POPULATION

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Keywords. Epidemiological study; Cancer of palatine tonsil; Finnish population

Objectives. To analyze correlations between mortality rates of patients with palatine tonsil cancer and nine impact factors in the Finnish adult population between 1997 and 2020.

Materials and Methods. Mortality rates of patients with palatine tonsil cancer were plotted in a scatter plot with nine impact factors. All data was collected between 1997 and 2020, from public databases provided by Statistics Finland, Official Statistics of Finland and Finnish Institute for Health and Welfare. The impact factors were: percentage of people with BMI over 30, percentage of population currently using smokeless tobacco (snus), estimated percentage of smokers, annual syphilis incidence, annual HIV incidence, annual Lyme disease incidence, annual average radon exposure levels in indoor air of homes, annual incidence of hepatitis C, and liters of alcohol consumed annually. Correlation was evaluated using Spearman's correlation coefficient.

Results. Spearman's correlation coefficient was statistically significant in all tested correlations ($p < 0.05$), including a positive correlation between palatine tonsillar cancer and the years 1997–2020 ($\rho = 0.765$). A positive correlation was found between tonsillar cancer mortality rate and Percentage of people with BMI over 30 ($\rho = 0.719$), syphilis incidence ($\rho = 0.556$), HIV incidence ($\rho = 0.437$), Lyme disease incidence ($\rho = 0.801$), percentage of population using smokeless tobacco ($\rho = 0.622$). A negative correlation was found between tonsillar cancer mortality rate and Annual average radon exposure levels ($\rho = -0.650$), hepatitis C incidence ($\rho = -0.511$), percentage of smokers ($\rho = -0.626$), liters of alcohol consumed annually ($\rho = -0.492$).

Conclusions. This study shows that more people with a BMI over 30, higher syphilis incidence, HIV incidence, Lyme disease incidence, and higher percentage of population using smokeless tobacco are all correlated with higher palatine tonsil cancer mortality rates. Additionally, lower radon levels, hepatitis C incidence, percentage of smokers and less liters of alcohol consumed yearly are correlated with higher palatine tonsil cancer mortality rates.

OTHER MEDICAL TOPICS

ACADEMICIAN JĀNIS STRADIŅŠ, THE FIRST HISTORIOGRAPHER OF THE MUSEUM OF MEDICAL HISTORY OR PATRON OF THE MUSEUM?

Rita Gravere¹

¹*Pauls Stradiņš Medicine History Museum*

Objectives. To describe the performance of Jānis Stradiņš as the first museum historiographer and to evaluate what his role was in the life of the medical history museum, in the representation of history and in advertising, or in his career.

Materials and Methods. Are used materials from the collection of Paula Stradiņš Medicine History Museum and J. Stradiņš publications. The historical comparative and descriptive method was used during the research.

Results. Jānis Stradiņš first focused on collecting medical history materials in 1957, when he was hired half-time at the museum. The first scientific report on the creation of the museum was published in 1960. After the death of Pauls Stradiņš in 1958, J. Stradiņš organized and systematized the archive of the house during 6 years (1959–1965). Later, he also focused on the archives of the Latvian Academy of Sciences, as well as collected memoirs, which were published in two memoirs about Pauls Stradiņš (1961, 1967). According to K. Aron's opinion, J. Stradiņš work can be considered the first sample of memorial literature. Not being a professional historian, J. Stradiņš sometimes allowed polemical interjections and elements of fantasy. However, J. Stradiņš last article, dedicated to the creation of the Medical History Museum (2017), unlike the first ones, is not only based on serious documentary studies, but also meets all the requirements of a professional historian.

Conclusions. Jānis Stradiņš was happy to talk a lot about his interest in the history of medicine and his contribution to the history of the Museum of Medical History. At the beginning, using his father's notes and his own memories, but over the years, he switched to a purely academic presentation with references and sources and document publications, thus declaring himself not only as an heir and father's secretary, but also as a historian.

ACUTE ZONAL OCCULT OUTER RETINOPATHY (AZOOR): CASE REPORT

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Objectives. Acute zonal occult outer retinopathy (AZOOR) is a rare disease with a limited number of cases described in the literature. It is characterised by acute loss of one or more zones of outer retinal segments. Patients typically are young women, presenting with photopsia, scotomas and variable fundoscopic changes. There is no proven treatment for AZOOR.

A 31-year-old caucasian woman presented with acute pain in the temporal region, photopsia and blurry vision in the left eye for five days. On admission her visual acuity was VOS = 0.4n.c and VOD = 1.0n.c. Left eye movements were painful in all directions. In fundus oculi examination inflammation above the fovea in the right eye (OD) and around the fovea in the left eye (OS) was found. Optical coherence tomography (OCT) examination showed OS parafoveal zone of diffuse retinal pigment epithelial (RPE) atrophy, loss and decreased retinal nerve fiber layer (RNFL) on inferior quadrant and OD superior paramacular zone of diffuse RPE atrophy and loss without changes in RNFL. Patient was admitted in the neurological department with suspicion of acute optic neuropathy. CT and MRI were performed and no pathological changes were found. Patient underwent a 3-day intravenous treatment course with methylprednisolone 1000 mg once a day. After initial treatment her visual acuity was improved to VOS = 0.6n.c and VOD = 1.0n.c. and painful eye movement was diminished. Over a 3-month follow-up period, visual acuity was VOS = 0.9n.c. Initial OS RPE changes in OCT examination minimised around parafoveal region and regeneration of RPE was observed but new RPE defect developed in inferior paramacular zone. No changes in dynamic were seen in OCT examination of OD. Based on OCT changes in both eyes and patient's complaints the AZOOR was diagnosed.

AZOOR has similar clinical features to other retinopathies making diagnosis complicated. Multimodal imaging tests are essential for AZOOR diagnosis.

AMBIGUOUS ROLE OF STENTING DURING AND AFTER ENDOSCOPIC DACRYOCYSTORHINOSTOMY

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Objectives. It has been previously established that in endoscopic dacryocystorhinostomy (endo-DCR), stenting is the “gold standard” for preventing rhinostomy closure. The modal standard period between stent placement and evacuation, based on literature review, is three months. To decrease complication risk, it is preferred to evacuate the stent as soon as possible. However, there are still no clear guidelines about post-operative management of stents, although it directly influences outcome of surgical treatment. The aim of this study was to evaluate the potential impact of stenting on outcome in patients undergoing endoDCR.

Materials and Methods. A retrospective study of patients who underwent primary endoDCR at two medical centres in Riga (Latvia) – “Jugla” and “AIWA Clinic” by the same surgeon between January 2013 and December 2022 was conducted. The indication for surgical intervention in all participants was nasolacrimal system distal obstruction.

Results. In total 272 pts. were enrolled, which were divided into three groups: 66 (24.3%) with the stent for 3 months (control group (I)), 154 (56.6%) – for 1 month (II), 52 (19.1%) without stenting (III). 10 patients had re-operation due to stoma closures: 6 (9.1%), 3 (1.9%) and 1 (1.9%) respectively ($p = 0.027$). The frequency of reoperation due to stoma closure was higher in the control group. This may be connected to the beginning of our endo-DCR practice when we acted according to the “gold standard” and had leaved the stent for 3 months. At the same time, lower technical support and lower experience of the surgeon took place at the beginning of the practice of this surgery.

Conclusions. Reducing of stenting terms or non-stenting showed no worse surgical outcomes than in the control group. The preliminary results have demonstrated that stenting and other endo-DCR factors require further study to improve treatment strategy.

ANALYSIS OF MOLECULAR GENETIC TESTING FOR HEREDITARY FORMS OF CANCER 2020–2022

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Objectives. The aim of this study was to determine the clinical and molecular characteristics of patients in years 2020–2022 who underwent hereditary cancer multigene panel testing due to clinical histories suggestive for increased risk of hereditary cancer syndrome.

Materials and Methods. This retrospective study includes 206 patients, of whom 70 were paediatric cancer cases, 120 adults mostly breast cancer cases, 16 adult cases were referred for cascade screening due to positive family history. Years included in study are 2020–2022. Patients were tested by gene panel done with massive parallel sequencing. Family variants were confirmed by Sanger sequencing.

Results. The mean age at the time of NGS in minors was 13 years, adults – 46 years. Overall, genetic testing identified a disease causing pathogenic or likely pathogenic variant in 37% of patients ($n = 70$), 17% of minors ($n = 12$), 48% of adults ($n = 58$). The cascade screening for the asymptomatic persons was positive in 88% ($n = 14$), negative in 12% ($n = 2$).

BRCA1 ($n = 28$; 48%) *BRCA2*, ($n = 10$; 17%), *CHEK2* ($n = 8$; 14%) were the most identified variants in adults. Causative variants in *ATM*, 9% ($n = 5$), *PALB2*, 5% ($n = 3$), *RAD51C*, 1.9% ($n = 1$), *FANCM*, 1.9% ($n = 1$), *TP53*, 1.9% ($n = 1$), and *MSH6*, 1.9% ($n = 1$) were also identified. 33% ($n = 15$) from all positive *BRCA1/2* variants were founder mutations already known in our population by previous studies. Test result was negative in 51% ($n = 69$) of patients. 9 variants of uncertain significance (VUS) were identified in 7% ($n = 9$) of patients.

Conclusions. The findings demonstrate the clinical significance of genetic testing for patients with clinical histories meeting diagnostic criteria for a specific hereditary cancer syndrome for better cancer surveillance and management strategies.

APPLICATION OF FLUORESCENCE IMAGE GUIDED CHOLANGIOGRAPHY FOR ASSESSMENT OF BILIARY ANATOMY IN PATIENTS WITH ACUTE CHOLECYSTITIS

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Objectives. Bile duct injuries(BDI) remains one of the most threatening complications during laparoscopic cholecystectomy (LC). In patients with acute cholecystitis (AC) the risk of BDI may increase. Fluorescence Cholangiography (FC) is non-invasive method for a real-time visualization of biliary anatomy. The aim of this study is to evaluate effect of FC for detection of biliary anatomy in patients with AC.

Materials and Methods. Patients with AC were considered for LC using FC and included in study from 2020 till 2023. Patients were divided into two groups: Group1.mild AC; Group2.moderate AC. Fixed dose (12.5 mg) of *Indocyanine green* was administered intravenously 12 hours before the surgery. FC identification rate of the EXBD anatomy were scored both before and after the dissection according to *Critical View of Safety* principle. Adapted visualization scales were applied.

Results. A total of 67 patients underwent LC with FC: 37 females (55%), 30 males (45%). The mean age was 56 years, average BMI – 29 kg/m². Mild AC was diagnosed in 42(63%) and moderate in 25(37%) patients. The visualization rate of the *cystic duct (CD)*, *common bile duct (CBD)* and *common hepatic duct (CHD)* prior to dissection was 80%, 61%, 41% but after dissection it improved to 91%,80%,62%. The comparison of visualized EXBD before CVS dissection between the groups revealed:

Group 1.: CD-39(93%)
CBD-29(69%)
CHD-19(45%)
Group 2.: CD-14(56%, p = 0.007)
CBD-12(48%, p = 0.41)
CHD-8(32%, p = 0.79).

FC was considered to be helpful to detect CD in 39(58%),CBD in 39(58%), CHD in 27(40%) patients. *Disturbed score* showed that liver fluorescence didn't disturbed to detect EXBD in 60(90%), slightly in 4(6%), heavily in 2(3%) patients. Correlation between operative time and *Likert scale* showed statistically significant and moderate correlation (CD:r = -0.534, p < 0.001; CHD: r = -0.548, p < 0.001).

The mean OT in Group1. was 67(30–145), comparing to Group2. 81(45–145) minutes,(p = 0.002). The mean hospital stay in both groups was 6(3–18) days. No BDI or postoperative complications were reported.

Conclusions. FC is easy applicable and effective method for real-time visualization of EXBD that enhances surgeon's confidence performing LC.

ARTHRITIS CAUSED BY HEREDITARY HEMOCHROMATOSIS: CLINICAL CASE

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Objectives. Hereditary haemochromatosis (HH), an autosomal recessive disease, is the most commonly identified genetic disorder in Caucasians with a prevalence rate of 1:200–500. HFE gene C282Y homozygosity (or, rarely, C282Y/H63D compound heterozygosity) is necessary but insufficient for HH because of low penetrance. Haemochromatosis arthropathy is a secondary osteoarthritis (OA) and can be first and only manifestation. Early recognition is a unique opportunity to prevent progressive organ and joint damage due to constant iron overload.

We present a case of a 59-year-old-female patient who initially presented with painful swollen ankles and knees. She recalled arthralgias since the age of 53 with no apparent cause or concurrent illness. Ultrasound imaging revealed synovitis and large osteophytes in both knees, and synovitis in ankle joints. We ruled out autoimmune, inflammatory arthritides and gout. Laboratory analysis revealed mildly elevated serum ferritin concentration for the last years (285.–298.0 ng/mL) and normal inflammatory markers. Initial treatment with NSAIDs and physiotherapy had minimal effect on pain, function and swelling. Follow-up analysis revealed increased ferritin (466.1 ng/mL) and high-normal transferrin saturation TSAT (41.07%). A TSAT indicative of excess iron stores has been set at > 40%, and ferritin level at > 200 ng/mL, British Society for Haematology (BSH). Subsequently, genetic testing revealed that she was compound heterozygous for C282Y/H63D mutation, confirming the diagnosis of HH. The patient was referred to a hepatologist.

Patients with early OA and rapidly progressing joint degeneration should be evaluated for evidence of iron overload. Such patients should undergo measurement of the TSAT and serum ferritin. In addition, we need to consider other differential diagnoses because ferritin, an iron storage protein and an acute phase reactant, can be elevated by chronic inflammation, due to acute liver injury and other illnesses, such as HIV infection, hemophagocytic lymphohistiocytosis.

BIOCHEMISTRY OF CYTOKINE STORM

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Objectives. To research the biochemical mechanisms underlying the development of cytokine storm in order to establish the utility of specific cytokine testing and possible therapeutic targets in patients.

Materials and Methods. A wide area of articles from PubMed, Medscape, NCBI, HINARI, Google Scholar databases, Oxford academic journals over the last ten years describing the nature and role of cytokines, the biochemical mechanisms and physiological effects were explored.

Results. Physiologically there is balance between cytokine production and inflammation. The dysregulation of it leads to exaggerated immune response, which result in cytokine storm, responsible for local and/or systemic toxic and destructive effects. The cytokine storm in patients with COVID-19 infection was preceded by extremely high serum levels of pro-inflammatory cytokines and ferritin. Rapid viral replication and impaired viral clearance, low levels of interferons type 1 and increased neutrophil extracellular traps (NETs) lead to massive release of inflammatory mediators and increased pyroptosis.

Conclusions. The biochemical mechanisms underlying cytokine storm are not fully elucidated. Genetic factors, pathogen load and host susceptibility contribute to abnormal secretion of pro-inflammatory mediators and the development of cytokine storm. The assessment of cytokine levels is useful for monitoring the process and predicting the outcomes.

CAN INTRATUMOURAL VASCULARISATION CT CONTRAST DYNAMICS HELP DIFFERENTIATE MALIGNANT RENAL TUMOUR SUBTYPES?

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Objectives. Various types and malignancy grades of malignant renal tumours can be difficult to differentiate on imaging, however, they have impact on recurrence likelihood and other adverse outcomes, therefore early subtype recognition could benefit treatment strategy.

Materials and Methods. A retrospective study design was applied to a cohort of renal tumour resection patients who underwent preoperative computed tomography (CT) scans. CT scan data was processed to quantitatively and qualitatively assess tumour vascularisation by measuring lesion contrast media uptake and wash-out (HU), and evaluate tumour contrast enhancement patterns. Tumour histology and grading was performed post-resection and findings correlated to imaging data.

Results. 82 patients were enrolled in the study: 76 had renal cell carcinomas (93%) of which 55 (72%) were predominantly clear-cell carcinomas (ccRCC) with fewer papillary (N = 11), chromophobe (N = 7) and sarcomatous (N = 3) RCCs. 44% of RCCs were WHO grade 2; 27%, 22% and 7% were grade 1, 2 and 4, respectively. 6 patients had urothelial carcinomas. Papillary and chromophobe RCCs were likelier to have homogeneous enhancement on arterial phase than ccRCCs ($\chi^2 = 43.48$; $p = 0.03$), whereas urothelial carcinomas didn't have significantly different contrast uptake or wash-out patterns on other imaging phases. Higher grade malignant tumours had significantly higher density values (34–45 HU) on pre-contrast scans ($F = 6.71$; $p = 0.01$) and exhibited slower contrast wash-out on delayed phase imaging ($F = 3.07$; $p = 0.03$).

Conclusions. Quantitative and qualitative contrast dynamic assessment proved differences between ccRCCs and other subtypes of malignant renal tumours. High grade renal tumours exhibit slower contrast wash-out and have higher density on pre-contrast scans, possibly due to intratumoural haemorrhage. The findings provide possibility for new paths into prospective research with other imaging modalities such as contrast enhanced ultrasound and MRI for vascularization pattern analysis.

CANCER STEM CELLS

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Objectives. Cancer stem cells (CSCs), known also as tumour-initiating cells (TICs), represent quiescent, pluripotent subpopulation of malignant cells that maintain a low but steady level of unlimited proliferation. In experimental animal studies, CSCs show tumour-initiating capacity: even few inoculated cells can develop into a tumour, recapitulating the whole heterogeneity of neoplastic tissues. Nevertheless, TIC features do not mean that CSCs represent the origin of cancer. CSCs are currently considered rather a state than an entity, likely being in dynamic balance with the general malignant population. Nowadays, four sources of CSCs are proposed, including normal stem cells, mature cells, cancer cells and fusion cells. CSCs exhibit a wide scope of genetic, epigenetic (DNA methylation, changes in chromatin architecture, miRNAs), molecular (Notch, Hedgehog, Wnt pathways) and metabolic alterations. In addition, cancer stem cells interact with tumour microenvironment, including niche factors.

Although CSCs represent a minor fraction of tumour, they attract remarkable research interest due to their role in cancer resistance to chemo- and radiation treatment as well as recurrence. The low mitotic activity of CSCs already protects them from approaches that are directed against actively dividing cells. The other CSC resistance mechanisms include increased expression of drug transporters, allowing to eliminate toxic xenobiotics; ability to scavenge reactive oxygen species; and efficient DNA repair. Cancer stem cells escape immune surveillance via upregulation of PD-L1 that suppress activation of T lymphocytes; hypoxia-mediated downregulation of NKG2D ligand, resulting in loss of NK lymphocyte-mediated reactions; and defects in MHC I, affecting antigen presentation.

In conclusion, further CSC research is likely to bring significant additions to complex oncological treatment.

CAROTID ARTERY ANGIOPLASTY WITH DUAL LAYER MICROMESH STENT IN HEMODYNAMIC SIGNIFICANT STENOSIS – TECHNICAL AND CLINICAL RESULTS.

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Objectives. To perform a retrospective analysis of patients undergoing PTA procedure with double-layer micromesh stent in Pauls Stradins Clinical University Hospital in the time period from 2017 till 2022, including patient clinical characteristics, radiological findings one month and one year after the procedure, and complications, if there were any.

Materials and Methods. A retrospective cohort study was conducted enrolling in a total of 70 patients undergoing the PTA stenting procedure. Patients were divided into two groups: the conventional stent group with 12 patients and the double-layer micromesh stent group with 27 patients. All patient medical histories and radiological findings were analyzed. All patient control radiological findings were followed up one month and one year after the stenting procedure.

Results. Analyzing NASCET levels before and after the procedure, the results obtained in this study demonstrated statistically significantly lower NASCET levels after the procedure. The blood flow in carotid arteries was restored among both patient groups. Stent occlusion was found in one patient one week after the procedure among conventional stent group patients. One year after the procedure, hemodynamically significant re-stenosis was noted in one patient among conventional stent group patients, but two patients did not demonstrate hemodynamically significant stenoses. No stent re-stenosis was noted one month after the procedure among patients in the double-layer micromesh stent group. One year after the procedure, hemodynamically significant stenosis was noted in one patient, but a total occlusion with an ischemic stroke one year after the procedure was noted in one patient in the double-layer micromesh stent group.

Conclusions. PTA with a stent is a safe and effective treatment method associated with low complication risk for patients with hemodynamically significant carotid artery stenosis. Patients with the latest generation nitinol double-layer micromesh stent demonstrated a lower incidence of ischemic stroke and transient ischemic attack, compared with patients in the conventional stent group.

CAUSATIVE MICROORGANISM ASSOCIATION WITH OUTCOME IN CARDIAC SURGERY PATIENTS WITH INFECTIVE ENDOCARDITIS

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Objectives. Infective endocarditis is an inflammation of the inner layer of the heart by infectious etiology and usually is associated with poor clinical outcomes. However, the etiology can differ, where the most common causative agents in the developed world are *S.aureus*, *Streptococcus spp.*, *E.faecalis*, and coagulase-negative staphylococci.

Materials and Methods. In this retrospective study 253 patient medical records were analyzed who underwent cardiac surgery between the years 2016 and 2020 at Pauls Stradins Clinical University Hospital.

Results. One hundred forty-four patients underwent cardiac surgery due to *S.aureus*, *Streptococcus spp.*, *E.faecalis*, or coagulase-negative staphylococci-caused infective endocarditis. The rate of blood culture-negative infective endocarditis was 35.17%. Although *S.aureus* endocarditis patients had the highest intrahospital mortality rate, statistically significant differences were not found. However, one-year mortality ($p = 0.049$) and three-year mortality ($p = 0.03$) rates were indicating a significantly worse prognosis for *S.aureus* endocarditis patients. The highest rate of embolic complications were also observed in *S.aureus* endocarditis patients group. Coagulase-negative staphylococci were the most frequent causative microorganism in the patients with prosthetic valve endocarditis ($p = 0.015$). There were significantly more perivalvular complications observed in the coagulase-negative staphylococci group ($p = 0.024$).

Conclusions. Among the most common causative agents of infective endocarditis *S.aureus* is associated with the worse long-term prognosis and the highest rate of embolic complications. Coagulase-negative staphylococci were associated with prosthetic valve endocarditis and perivalvular complications.

CEREBELLAR TUMOUR IN BANNAYAN-RILEY-RUVALCABA SYNDROME

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Objectives. Bannayan-Riley-Ruvalcaba syndrome (BRRS) is one of the PTEN Hamartoma Tumor Syndrome (PHTS). It is linked to germline mutation in the tumor suppressor gene — phosphatase and tensin homolog (*PTEN*). Although central nervous system (CNS) tumors have been described in Cowden syndrome (CS), another PHTS, there is no neuropathologic reporting of CNS tumors in patients with BRRS. We report a case of a 27 year old male with Bannayan-Riley-Ruvalcaba Syndrome with history of intermittent headaches presenting with an episode of seizure. Brain imaging showed a large complex, solid mass with numerous intralesional cystics and indistinct margins. Resection specimens showed cerebellum with relatively preserved normal foliaceous architecture, with a well-circumscribed area showing thickening and disruption of the molecular layer. Granular layer contained intermixed granule cells of increased size. No dysplastic ganglion cells were identified. Immunohistochemical studies with Neurofilament and GFAP highlights abnormal fiber arrangements in the molecular layer. Olig2 and NeuN highlights increased immunopositive cells in the abnormal molecular layer. Although BRRS and CS are now grouped in the same PHTS spectrum, we present here a tumor with distinct histopathologic features from dysplastic cerebellar gangliocytoma typically associated with CS.

CHANGES OF SUPERFICIAL FOVEAL AVASCULAR ZONE BEFORE AND AFTER CATARACT EXTRACTION WITH FOLLOWING VITRECTOMY

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Objectives. To determine the size of superficial foveal avascular zone (FAZ) in patients before and after phacoemulsification with following vitrectomy for a macular hole (MH) and epiretinal membrane (ERM).

Materials and Methods. A retrospective study based on patient medical records that underwent phacoemulsification and intraocular lens implantation with following pars plana vitrectomy due to full-thickness MH and ERM at Pauls Stradins Clinical University Hospital was performed. Optical coherence tomography (OCT) angiography was performed to manually measure FAZ area. Best-corrected visual acuity (BCVA) and FAZ measurements were taken before and 2.5 months after surgery. Statistical analysis was performed using IBM SPSS version 27.

Results. Thirty-two eyes of 32 patients were included in the study. In 20 eyes MH and in 12 eyes ERM were observed. The median age of patients were 68 years. The median BCVA preoperatively was 0.16 and postoperatively 0.5. There was a significant BCVA improvement after surgery in MH ($p < 0.01$) and ERM ($p = 0.012$) patients. Median preoperative FAZ area was 0.13 mm^2 and postoperative FAZ area was 0.11 mm^2 . However, no significant association between pre- and postoperative FAZ area was found in MH and ERM. The correlations between BCVA and the area of FAZ before and 2.5 months postoperatively did not reach statistical significance ($p = 0.57$).

Conclusions. Superficial foveal avascular zone does not change after cataract extraction with following pars plana vitrectomy. However, visual acuity significantly improves for both MH and ERM patients after surgery.

CHARACTERISATION OF PROLAPSING HAEMORRHOIDAL DISEASE IN DIFFERENT AGE GROUPS OF FEMALE

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Objectives. A major objective of the the study was the comparison of clinical symptoms and surgical treatment techniques in two different age groups of HD patients.

Materials and Methods. Medical records of 81 female patients stratified into two study groups (under (the 1st group (G1) and over (the 2nd group (G2) 45 years of age) and presented with HD grade III and IV, and treated between September 2022 and November 2022 at Pauls Stradiņš Clinical University Hospital were retrospectively analyzed.

Results. Thirty-four subjects among 81 (42%) HD women patients (median age – 33) constituted G1, whereas 47 (58%) – G2 (median age – 62). Bleeding was found in 27 (80%) and 18 (39%) cases for G1 and G2, respectively. Perianal mass and mucosal prolapse were reported in 4 (12%) and 23 (49%) cases. Defecation disorders were found in 9(26%) of G1 when compared to the 33 (70%) cases in G2. The average duration of symptoms in G1 was 3 years compared to G2 – 12 years. The most common diagnosis in G1 was grade III HD with mucosal prolapse and/or ventral rectocele – 33 (97%) when compared to G2 that commonly presented with grade IV HD with mucosal prolapse, ventral rectocele +/- polyps 39 (83%). Longo hemorrhoidectomy was performed both in G1 – 32 (94%) and G2 – 42 (89%). The LigasureTM procedure was used only in 5(11%) cases in G2. Complications were registered in 2(6%) and 0(0%) cases for G1 and G2, respectively; specifically for G1 – 1 (3%) reoperation and hemostasis.

Conclusions. In both groups studied, the main HD complaint was discomfort, pain, and bleeding. The duration of symptoms suggests that HD manifests much earlier than described in the literature. The etiology-based Longo technique is still the most suitable treatment for prolapsing HD.

CHROMOGENIC IN SITU HYBRIDISATION (CISH): EXPERIENCES FROM HISTOMORPHOLOGICAL RESEARCH ON CLEFT LIP AND PALATE TISSUE SAMPLES

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Objectives. Chromogenic In-situ Hybridization (CISH) is a relatively new technique that allows the localization and visualization of a specific DNA or RNA sequence in a tissue specimen. The technique utilizes a chromogen-labelled DNA probe that gives a chromogenic dot-like response that can be visualized using the peroxidase reaction. Since the CISH probes are standardized with complete kits, the need to perform the more expensive fluorescent microscopy is eliminated. Given this superiority of the technique, we aimed to explore the utility of the technique in cleft lip and palate tissue samples. Cleft lip and palate are one of the most common congenital defects worldwide. The exact morpho-etio-pathogenesis that cause and sustain the impaired wound healing in cleft lip and palate are yet to be elucidated, making the application of CISH extremely beneficial in morphological research.

Materials and Methods. CISH was performed using ZytoDot 2C CISH Implementation Kit (ZytoVision GmbH, Bremerhaven, Germany). Probes of various growth factors like *FGFR1*, *FGFR2*, and *FOXO1* were used in this study. Additional probes of homeobox genes like *DLX4*, *HOXB3*, *MSX2*, and *PTX3* were also used. The study comprised samples from 15 pediatric patients suffering from cleft lip and palate. Under the microscope, two brown-colored dots (signals) were expected per nuclei of normal cells in interphase or metaphase without aberrations of the examined chromosomes.

Results. No changes in the gene amplification and expression of homeobox genes like *DLX4*, *HOXB3*, *MSX2*, and *PTX3* were noted in the cleft-affected tissue. Similar results were noted for *FGFR1*, *FOXO1*, and *FGFR2*. In the connective tissue, however, *FGFR1* demonstrated a low level of amplification, suggesting a downstream dysregulation in wound healing pathways.

Conclusions. Due to the easy interpretation of results and the technique's superiority when compared with other morphological techniques, CISH represents an emerging modality in morphological tissue research.

CLEFT CANDIDATE GENE PROTEIN IMMUNOREACTIVITY IN HUMAN NON-SYNDROMIC CLEFT AFFECTED TISSUE

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Objectives. Craniofacial clefts are described as abnormalities of the orofacial region development which are characterized by the incomplete fusion of facial folds. Multiple cleft candidate genes have been associated with craniofacial cleft development, but their exact role is relatively unclear in different cleft types. This research evaluates the immunoreactivity of Homeobox Protein BarH-like 1 (BARX1), Distal-Less Homeobox 4 (DLX4), Forkhead Box E1 (FOXE1), Homeobox Protein Hox-B3 (HOXB3), Muscle Segment Homeobox 2 (MSX2), Sonic Hedgehog (SHH), SRY-Box Transcription Factor 3 (SOX3), Wnt Family Member 3A (WNT3A), and Wnt Family Member 9B (WNT9B) proteins in different cleft tissue while also describing correlations between protein containing cells.

Materials and Methods. Non-syndromic cleft affected tissue was gathered from cleft patients who received surgical intervention. Cleft tissue was subdivided based on the tissue type – unilateral cleft lip (n = 36), bilateral cleft lip (n = 13), cleft palate (n = 26). The control group was organized from 7 individuals. Immunohistochemistry was performed. Slides were evaluated with the semiquantitative method. Non-parametric statistical methods were applied. Correlations between the number of factor-containing cells were calculated.

Results. Statistically significant differences were identified for the number of BARX1, FOXE1, HOXB3, MSX2, SHH, SOX3, WNT9B-containing cells between controls and cleft patient groups but no statistically significant differences were found for DLX4 and WNT3A. Several statistically significant correlations between factors were found in each group.

Conclusions. The statistically significant increase of HOXB3 and SHH within unilateral cleft lip tissue signifies their association with this specific cleft type. Transcription factors BARX1, FOXE1, SOX3, and WNT9B are probably involved with the formation of both unilateral cleft lip and bilateral cleft lip, while MSX2 might be pathogenetically involved with all three cleft types. Similar correlations in all evaluated cleft types could indicate the existence of similar pathogenetic mechanisms within different cleft variations.

COLOUR VISION IN CHILDREN WITH AMBLYOPIA

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Objectives. Amblyopia is a visual impairment without any obvious organic abnormality (Hoyt & Taylor, 2012). Diagnosing amblyopia at a young age is very important because its treatment is more effective at an early age (Bradfield, 2013). As well as a reduction in visual acuity, amblyopia can also be associated with defects in other visual functions: reduced contrast sensitivity, loss of binocularity, and colour perception problems (Rajavi et al., 2015). Unlike individuals with normal colour vision, who distinguish between all primary and intermediate colours and saturation, individuals with colour vision deficiency are able to discriminate more saturated colours with larger angular stimulus sizes compared to those with normal colour perception. The aim of this study was to determine whether patients with amblyopia present colour vision deficiency when the angular size of the stimulus target is changed.

Materials and Methods. The study involved 40 participants: 20 children without amblyopia and 20 children with amblyopia. Participants were assessed for colour vision using the Ishihara test and a computerised colour vision test. In the Ishihara test, children were asked to recognise a number, and in the computerised test, they were asked to identify the position of a target.

Results. Considering the results of the study, it can be argued that reducing the angular size of the target makes it more difficult for children with amblyopia to perceive colours, hence the results of the computerised test indicate a deficit in colour vision.

Conclusions. The angular size of the target does not affect colour vision in non-amblyopic children, as the chromatic distance does not change with the angular size of the target. Visual acuity and type of amblyopia do not affect colour vision.

COMPARISON OF ANTERIOR CAPSULORHEXIS OPENING REDUCTION AFTER COMBINED AND SEQUENTIAL CATARACT EXTRACTION AND VITRECTOMY

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Objectives. To compare the anterior capsular opening reduction in eyes treated with combined phacovitrectomy versus sequential phacoemulsification and vitrectomy.

Materials and Methods. A retrospective data review was performed of patients with cataract and coexisting epiretinal membrane (ERM) or macular hole. All patients underwent cataract extraction with phacoemulsification followed by a posterior chamber intraocular lens implantation. Combined or sequential pars plana vitrectomy for vitreoretinal disease was performed. The main outcome measures were preoperative and 1.5 months postoperative best corrected visual acuity (BCVA), and intraoperative and postoperative anterior capsular opening size (1 month following sequential surgery approach and 1.5 months following combined surgery approach).

Results. Twenty-nine eyes were included in this study. In 16 cases patients had macular hole, but in 13 cases ERM. Seven (24.1%) eyes underwent combined phaco-vitrectomy surgery, twenty-two (75.9%) eyes had separate, sequential phacoemulsification then vitrectomy. Median preoperative BCVA was 20/125, postoperative – 20/45. One and a half months after operation BCVA improvements were seen ($p < 0.001$). Capsular opening reduction were seen in both study groups, but the difference was not statistically significant ($p > 0.199$).

Conclusions. Cataract extraction and vitrectomy for macular disease is effective to improve visual acuity. Combined and sequential operation approaches create similar anterior capsular opening reduction.

COMPARISON OF ANTIOXIDANT ACTIVITY IN FRESH SPIRULINA AND SPIRULINA CONTAINING PRODUCTS

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Objectives. Antioxidants (AO) neutralize free radicals, thus preventing cell damage and reducing the risks of potential diseases, so it is important to consume foods rich in AO. Spirulina is a well-known food supplement demonstrating high AO activity, but several studies have shown that it fluctuates depending on other ingredients in the same food portion. This study aimed to compare the antioxidant activity of fresh spirulina and various spirulina-containing products.

Materials and Methods. Samples of fresh frozen spirulina, spirulina in apple juice, spirulina in cranberry syrup, and spirulina in Japanese quince syrup were investigated for AO activity by using ferric reducing antioxidant power (FRAP) and ABTS radical scavenging tests; total phenolic compounds (TPC) also were determined using Folin-Ciocalteu reagent. Three different extracts (ethanol, phosphate-buffered saline (PBS) standard solution, 1.5% CaCl₂ aqueous solution) were used. For the AO synergy effect characterization synergy coefficient (SC) was introduced and calculated.

Results. The highest AO activity values of fresh spirulina were obtained in PBS extracts, simultaneously it has the lower TPC activity. Binary mixtures preserved or improved the antioxidant activity of the product compared to spirulina alone. Clear synergism was revealed in the spirulina and Japanese quince syrup mixture, but an antagonistic effect of antiradical activity was detected in the mixture with apple juice. There was a negative correlation between TPC and AO values in syrups.

Conclusions. Different compounds other than polyphenols contribute to the AO activity of spirulina. Synergy and antagonism were observed for all investigated binary mixtures showing the complex nature of antioxidant systems.

CONTRAST-ENHANCED APPROACH TO PARATHYROID LESIONS

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Objectives. Despite the improvement in B-mode ultrasound (US) imaging quality, it may still be challenging to distinguish between different parathyroid lesions. The objective was to evaluate the findings of contrast-enhanced ultrasound (CEUS) in parathyroid lesions and to determine whether CEUS and CEUS post-processing can help to differentiate between hyperplastic and neoplastic parathyroid glands.

Materials and Methods. In this prospective study, 88 patients (18–83 years, F:M = 74:14) with hyperparathyroidism were recruited before parathyroid surgery. Multiparametric ultrasound – US, Colour Doppler, Superb Microvascular Imaging (SMI), CEUS (SonoVue) images were acquired and quantitative postprocessing was performed (VueBox). Results were compared with postsurgical morphology.

Results. The most common US characteristics of parathyroid adenoma (PA) vs hyperplasia (PH) were: well defined, hypoechoic lesions with increased echogenicity in centre (67% and 52%, respectively), cystic components (54% and 59%, respectively) with afferent vessel (93% for both), PA's were larger on average ($p = 0.001$). CEUS showed peripheral hypervascularity in early arterial phase (median = 10s), quickly reaching peak contrast concentration (median = 15s), following early washout (median = 27s) in PA and homogenous dynamics in PH with rapid washout ($p = 0.001$). The most prevalent morphological subtype of adenoma was chief-cell adenoma (79%, $n = 59$). Number of adenomas (61% of oxyphil subtype) displayed different pattern – preponderantly central enhancement. Fall time was shorter in PH's compared to PA's (8s vs. 11s). CEUS sensitivity for parathyroid pathology prior to postprocessing vs after postprocessing – 90% vs 98.2% and specificity 72.2% vs 85.3% ($p = 0.1$).

Conclusions. CEUS is valuable and powerful tool for the preoperative assessment of parathyroid pathology with high sensitivity and specificity in differentiation of parathyroid lesions, including subtypes of adenoma – majority of those are distinguished by peripheral uptake, central washout and slower hemodynamics, compared to hyperplasia with homogeneous enhancement and rapid washout, whereas oxyphilic adenomas showed predominantly central enhancement.

CORRELATION AND AGREEMENT OF CENTRAL CORNEAL THICKNESS MEASURED BY HEIDELBERG ANTERION, HEIDELBERG SPECTRALIS AND OPTOVUE ANGIOVUE OPTICAL COHERENCE TOMOGRAPHY

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Objectives. Precise estimation of central corneal thickness (CCT) is highly important to plan corneal refractive surgeries, to diagnose and manage glaucoma and corneal diseases. The purpose of the study was to assess correlation and agreement in CCT obtained by Heidelberg Anterior, Heidelberg Spectralis and Optovue AngioVue optical coherence tomography (OCT).

Materials and Methods. This was a prospectively designed study conducted on normal subjects recruited from the Pauls Stradiņš Clinical University Hospital. All subjects underwent Heidelberg Anterior, Heidelberg Spectralis and Optovue AngioVue OCT pachymetry on both eyes. Statistical analysis was performed using MS Excel and IBM SPSS 27. Intraclass correlation (ICC) estimates and their 95% confidence intervals were calculated based on a single-rating, absolute agreement, 2-way mixed effects model. The 95% limits of agreement (LoA) and Bland-Altman plots were used.

Results. This study enrolled 60 eyes of 30 subjects with no previous ocular surface disease. 63% (n = 19) of subjects were female and 37% (n = 11) were male. The median age was 57 years (range 25 to 88 years). The mean CCT measured by Heidelberg Anterior, Heidelberg Spectralis and Optovue AngioVue were 542 μm (SD = 37), 535 μm (SD = 35) and 536 μm (SD = 36), respectively. ICC coefficient > 0.97 ($p < 0.001$) indicated excellent reliability between the CCT measurements. The mean difference between Heidelberg Anterior and Heidelberg Spectralis measurements was -6.93 μm (95% LoA, -23.63 to 9.77 μm). The mean difference between Heidelberg Anterior and Optovue AngioVue measurements was -5.78 μm (95% LoA, -12.99 to 1.43 μm). The mean difference between Heidelberg Spectralis and Optovue AngioVue was -1.15 μm (95% LoA, -16.51 to 14.21 μm).

Conclusions. All three devices can be safely used to measure CCT. Measurements obtained with Heidelberg Anterior are interchangeable with Optovue AngioVue when performed by the same examiner. Extended research is needed to establish the repeatability between various examiners.

CORRELATION BETWEEN LINE-FIELD CONFOCAL OPTICAL COHERENCE TOMOGRAPHY AND HISTOPATOLOGY: PRELIMINARY RESULTS

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Objectives. Line-field confocal optical coherence tomography (LC-OCT) is a new, non-invasive technique that provides *in vivo*, high-resolution images in both vertical and horizontal sections. The aim of our study was to evaluate LC-OCT imaging in some inflammatory disorders and to correlate the resulting features with histopathology.

Materials and Methods. The retrospective study included patients with histopathological confirmed diagnosis of plaque psoriasis, atopic eczema and lichen planus, who were imaged with LC-OCT before the biopsy. LC-OCT was performed with the commercially available LC-OCT device.

Results. A total of 15 adult patients with histopathologically proven plaque psoriasis (N: 5), atopic eczema (N: 5), and lichen planus (N: 5) were included. In all cases, LC-OCT allowed the *in-vivo* recognition of the main microscopic features of the examined inflammatory skin disease, with a strong correlation with histopathology.

Conclusions. Although future studies on larger series of patients are necessary, LC-OCT, based on these preliminary findings, may represent a promising tool in inflammatory skin disorders with potential applications including enhanced diagnosis, biopsy guidance, follow-up and treatment monitoring.

DANDELION'S ACTIVE COMPONENTS SUPPRESS GLIOBLASTOMA U-138 MG CELLS VIABILITY

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Objectives. Glioblastoma is the most common high-grade CNS tumor in adults. *Taraxacum officinale* commonly known as Dandelion, contains a large amount of phytochemicals. Some of its biologically active substances have been reported to be potential anticancer remedies. The objective was to evaluate the effect of Dandelion root extracts on the viability of U-138 MG cells in order to determine the most effective concentrations of chicoric (CA), chlorogenic (CHA), and caffeic (CA) acids (mg/mL) in the extract, which exhibit an antitumor effect.

Materials and Methods. Dandelion dry roots were extracted with DMSO and ethanol of three concentrations (20%, 50% and 80%). The extracts were filtered (Whatman nr. 5, WHA1005090, followed by Whatman nr. 1, WHA10010155 (Merck, Germany), dried and weighted ($\mu\text{g/L}$). The concentration of cinnamic acid derivatives was determined by liquid chromatography (Agilent 1260 with DAD). Viability of U-138 MG cells (Cell Lines Service, Germany) was evaluated by colorimetric MTT test (%). The Dandelion action was compared with that of doxorubicin.

Results. The best antitumor activity was determined in case of Dandelion root extracts prepared with 80% ethanol ($50.000 \mu\text{g/L} - 8.5 \pm 1.0\%$, that contained ChA – $52.500 \times 10^{-6} \text{ mg/mL}$, CGA – $269 \times 10^{-6} \text{ mg/mL}$, CA – $54 \times 10^{-6} \text{ mg/mL}$) and DMSO ($145.000 \mu\text{g/L} - 18.6 \pm 4.5\%$, that contained ChA – $1096.2 \times 10^{-6} \text{ mg/mL}$, CGA – $159.5 \times 10^{-6} \text{ mg/mL}$, CA – $139.2 \times 10^{-6} \text{ mg/mL}$). This activity was better than of doxorubicin ($p = 0.003$), which showed the best results at $54.350 \mu\text{g/L}$ ($8.64 \pm 1.65\%$).

Conclusions. The results obtained allow us to consider dandelion root extract as a promising source of cinnamic acid derivatives, the content and ratio of which seems to be optimal for suppressing the viability of glioblastoma. The manifested antitumor activity also depends on the type of extractant and its concentration.

DETECTION OF THE ANATOMICAL VARIATIONS OF HUMAN OCCIPITAL CONDYLES IN DIGITAL VISUALISATIONS

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Objectives. The present study aimed to determine the variability of the human occipital condyles (OC).

Materials and Methods. The virtual 3D dissection table “Anatomage” was used for the visualization of the human occipital bones and condyles. Data were collected from four digital human cadavers of the “Anatomage Table’s” database at the Department of Morphology of Rīga Stradiņš University. The measurements were based on six landmarks and carried out three times by one investigator after several practices and accuracy. The mean of these readings was taken as the observed value. The following parameters of the OC were measured, using a digital roller: length, breadth and several anterior, posterior distances: intercondylar (AICD, PICD), between tip and basion (DAT-B, DPT-B), and between tip and opisthion (DAT-O, DPT-O). Collected data were analyzed using IBM SPSS Statistics

27.0. The location of the hypoglossal canal (HC) and the shapes of OC were visually detected.

Results. The mean length and breadth of the OC were 17.3 ± 2.1 mm and 10.2 ± 2.1 mm (right), following 20.0 ± 2.9 mm and 10.3 ± 2.2 mm (left). The mean AICD and PICD were found as 12.0 ± 3.7 mm and 32.8 ± 3.8 mm. The mean DAT-B were 6.0 ± 1.8 mm and 5.0 ± 0.8 mm (right), while mean DPT-B were 21.5 ± 1.9 mm and 22.0 ± 4.9 mm (left). The mean right and left DAT-O were 30.8 ± 5.1 mm and 28.8 ± 0.4 mm, whereas the mean right and left DPT-O were 20.0 ± 4.5 mm and 19.0 ± 4.0 mm. The OC shapes were detected mainly like an oval and kidney-like condyle. The most dominant location of HC was in the middle 1/3 of OC.

Conclusions. This study illustrated the anatomical variations of the virtual OC but the detection of them was not the same as in traditional anthropometry. Despite this, these anatomical data may provide a basis for following analyses of the OC in dry skulls and their clinical interpretations.

DEVELOPMENT OF THE EARLIEST HUMAN HAEMATOPOIETIC STEM CELLS: FROM EMBRYO DISSECTIONS TO TRANSCRIPTOMICS

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Objectives. The earliest human haematopoietic stem cells (HSCs) emerge in the ventral domain of the dorsal aorta around day 32 of development. This process continues for about 10 days, before HSCs migrate to the liver (*Ivanovs et al. 2011.*) It is accepted that HSCs emerge from mesodermal precursors through endothelial intermediates, but our knowledge of this process in the human is very limited. During my talk, I will briefly outline the development of HSCs in the early human embryo, focussing on their unique functional properties and phenotype (*Ivanovs et al. 2014; Ivanovs et al. 2020.*) After we had functionally validated where and when the first human HSCs emerge, it became possible to study transcriptome landscape of the earliest human HSC niche. As a result, several research groups proposed transcriptomically defined HSC specification maps and suggested secretory factors vital for this process (*Zeng et al. 2019; Crosse et al. 2020; Calvanese et al. 2022.*) The findings of these studies will be briefly discussed. I will also try to match our recent HSC phenotypic analysis to these publicly available datasets (*Ivanovs et al., unpublished*).

DIGITAL SOLUTIONS IN PATHOLOGY EDUCATION – EIGHT YEARS OF EXPERIENCE

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Objectives. In many fields, digital transformation is gaining an increasing importance. Considering this, the aim of our study was to summate and assess the experience of a single university department with different digital solutions in order to clarify their efficacy in undergraduate pathology education.

Materials and Methods. A scope of original educating materials was generated. Learning outcomes (in 10-point scale) and students' feedback were analysed in dynamics (2015–2022).

Results. Our team has elaborated a complex of digital solutions, ranging from lecture records and fixed image database to interactive tests, virtual microscopy via OpenSlide and gamification-based clinical cases featuring branched decision-making tree (via Twine). Lectures and educating tests had the most consistent positive feedback while transformation of clinical cases into computer game and virtual microscopy triggered the highest interest in a subfraction of students. Regarding the resources, gamification and virtual microscopy have the most specific software requirements; high-quality slide scanning can be associated with technological expenses for both equipment and software, and lectures, games and tests necessitate a significant input of dedicated work.

Conclusions. Digital transformation must follow the classic pathways of education, providing well-structured information combined with practical training and discussions. Thus, a complex approach is mandatory. Digital solutions are attractive and user-friendly but they are means, not the ultimate goal.

DOCTOR HANS HERBERT WEGENER 30 YEARS WITH PHYSICIANS OF THE BALTIC STATES

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Objectives. The aim of study is to reflect invaluable activities of Hans Herbert Wegener mainly in the field of life long education of Baltic physicians.

30 years ago, German Baltic Doctors association (Deutsch-Baltische Ärztesgesellschaft) was founded to restore cooperation between medical staff from Germany and the Baltic States. The founder and the first president (1991–2001) and (2007–2013) was pathologist of Berlin Moabit hospital, chief of Pathology institute H.H. Wegener. He has born in Guatemala, lived in Leipzig, then fled from GDR to West Berlin to study medicine at the FU. He got PhD in 1968 and was the author of about 60 publications. The founders of the Latvian section were I. Krastiņš, P. Apinis, A. Požarnovs, H. and I. Adoviči, Dz. Mozgis etc. Presidents in Latvia were H. Adovičs, J. Pudāne, Dz. Mozgis.

Materials and Methods. We have used publications in German and Latvian press, materials of 27 German symposium for Pathology and personal experience.

Results. Each year H.H. Wegener had organized annual doctor meetings in Berlin and in the towns of Latvia, Lithuania, Estonia but with local organizers – A. Lipping (ES), R. Kleina (LV), A. Rimkevicius (LT) regular symposium for pathologists inviting the best lecturers from Europa.

In 90's H.H. Wegener organized shipments of medical equipment, literature, medications for rural hospitals. Regularly 5–7 doctors per year underwent internships in Germany in chosen specialty for one month.

Doctor is fond of Baltic culture, nature and politics and therefore he understood perfectly our victory for independence. After symposium he always planned the trips around Baltic countryside with excellent concerts, he plays piano and organ himself.

Conclusions. H.H. Wegener has proved how many one person can do for the medicine of other countries. All Baltic doctors, especially pathologists who have been in contact with doctor Wegener always highly appreciate and admire his charity, patronage, philanthropy and generosity.

DOES IMPLEMENTATION OF A STRUCTURED CLINICAL QUALITY MANAGEMENT SYSTEM IMPROVE OUTCOME IN ALL DAY COLORECTAL CANCER SURGERY: 15-YEAR SINGLE CENTER EXPERIENCE

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Objectives. From 2006 on German Cancer Society implemented so called “Certified Gut Cancer Centers” in Germany Hospitals and defined several structural requirements such as participants formal qualification, extend of supportive care, scientific activities etc. as well as adherence to S3 guidelines and documentation of surgical outcome benchmarked to all system registered hospitals.

Materials and Methods. The Clinic for Viszeral- and Oncologic Surgery Elbe Klinikum Stade qualified in 2007 for the project. Data for 30 days overall mortality, surgical side infection, anastomotic leakage, re do surgery, Quality of TME (MERCURY I+II) and completeness of resection in rectal cancer were documented prospectively in each patient.

Results. From 2007 up to 2021 in total 1049 oncologic resections for primary colonic cancer patients and 604 for primary rectal cancer patients were performed. Mean overall 30 days mortality rate in elective cases was 2.46% (range 0–5.1%/year), mean overall surgical side infection rate 3.95% (range 0–10.14%/year). Re do surgery was mean 8.78% (range 0–18.06% / year) in colon and 8.61% (range 0–18.01%/year) in rectal cancer operations. Mean anastomotic leakage rate was 4.02% (range 0–10.14%/year) for colon and 4.57% (range 0–12.00%/year) for rectal cancer surgery. Completeness of resection was mean 94.11% (range 88.2–100%) in rectal cancer and good quality of TME (MERCURY I+II) was mean 95.58% (range 88.8–100%/year). A considerable annual variation could be detected with subsequent improvement after PDCA application.

Conclusions. Comprehensive and audited result monitoring imbedded in a structured quality management system (Certified Gut Cancer Center DKG) provides rational insight into variation and deviation of surgical outcome parameters. Consequent application of PDCA principles proved feasible in enhancing quality of patient care in all day reality of a secondary referral center for colorectal surgery.

EFFECT OF METABOLIC SYNDROME ON MICROCIRCULATORY FUNCTION IN PSORIATIC PATIENTS

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Objectives. Metabolic syndrome (MetS) includes such factors as obesity, elevated blood pressure, and distorted lipid- and glucose metabolism. It is well known that psoriasis and the metabolic syndrome separately are risk factors for systemic microvascular dysfunction. The metabolic syndrome has been associated with psoriasis and according to publications psoriatic patients, have at least twice the risk of developing metabolic comorbidities compared with the general population. We aimed to find out whether there is a significant effect on microvascular function in psoriatic patients with and without MetS.

Materials and Methods. MetS factors were analysed for 34 patients (46 ± 12 yr) with moderate to severe psoriasis vulgaris. MetS was defined using the National Cholesterol Education Program Adult Treatment Panel III criteria. MetS were positive for 13 patients (MetS group) and negative for 21 patients (non-MetS group). Blood flow (PU, perfusion units) in psoriatic and normal skin was measured by a single-channel Laser Doppler blood flowmeter (Blood Flowmeter, ADInstruments Ltd., Oxford, UK). Post-occlusive reactive hyperaemia (% changes from basal flow) was assessed on the plaque (psoriatic) and non-plaque (normal) site.

Results. There was no group difference in basal blood flow and postocclusive hyperemia test in psoriatic skin. However data of normal skin showed statistically lower postocclusive hyperemia in MetS group compared with non-MetS (5% vs 53%, $p < 0.05$). In the MetS group, lower postocclusive hyperemia was statistically significantly correlated with a higher waist circumference ($r = -0.408$, $p < 0.05$) and lower serum levels of HDL ($r = -0.526$, $p < 0.05$).

Conclusions. Our data suggests that the pathogenesis of microvascular dysfunction in psoriasis patients has a complex origin which might involve the interaction between the immune system and several metabolic syndrome factors. Since the underlying mechanisms are still unclear, the study should be continued to find out which of the growth factors and cytokines might have a diagnostic value.

EOSINOPHILIC OESOPHAGITIS AS AN UNDERLYING CAUSE OF PATIENTS ADMITTED WITH FOOD BOLUS OBSTRUCTION UNDER OTORHINOLARYNGOLOGISTS IN EAST OF SCOTLAND

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Objectives. Patients with food bolus obstruction (FBO) are admitted under Ear, Nose and Throat (ENT), Medical or Surgical teams. In Scotland patients with FBO above sternal notch are admitted under ENT. The main aim during the acute admission is to resolve FBO, nevertheless underlying cause of FBO should be investigated. In literature, eosinophilic oesophagitis (EoE) is the single most common cause of FBO.

Materials and Methods. A retrospective study of adult FBO admissions to ENT ward in Ninewells Hospital, Dundee, Scotland from year 2016 to 2019. Electronic and paper notes were examined for information on FBO admissions, type of food bolus, interventions performed to resolve FBO and investigations and follow-up used to look for the underlying cause of FBO.

Results. In total there were 120 FBO admissions. Men were 2.16 times more than women. Half required surgical intervention, of those 31% rigid oesophagoscopy (RO) and 69% oesophagogastroduodenoscopy (OGD). Biopsies were taken in half of OGD and in less than 10% of RO. Of all biopsies, 50% had histopathological diagnosis of EoE, although potentially some were EoE negative due to inadequate number of biopsies taken. 84% of patients, in who FBO resolved spontaneously or who did not have OGD with biopsies performed while being inpatient, did not have outpatient follow-up OGD or transnasal oesophagoscopy (TNO) with biopsies arranged.

Conclusions. Biopsies were not taken in all FBO patients undergoing oesophagoscopy, leaving EoE underdiagnosed. Follow-up arrangements were suboptimal to exclude EoE. ENT doctors and OGD endoscopists need to be better informed on significance of EoE in patients presenting with FBO acutely. Patients presenting with FBO should be admitted under gastroenterologists who can perform OGD to resolve FBO and take adequate biopsies to exclude EoE. ENT surgeons should be involved when airway compromise is present due to FBO or a removal of food bolus with OGD has failed.

EVALUATION OF ANTIMICROBIAL AND DEFENCE PROTEINS IN SAMPLES OF PRIMARY AND RECURRENT NASAL POLYPS

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Objectives. To investigate the complex appearance, relative distribution and interlinks of β -defensin-2, β -defensin-3, β -defensin-4 and cathelicidin LL37 in case of primary and recurrent nasal polyps.

Materials and Methods. Study group consisted of 29 samples from patients with primary CRSwNP and 19 patients with recurrent nasal polyps. Samples were collected during functional endoscopic sinus surgery (FESS). Control group consisted of 17 normal healthy nasal mucosa samples gathered during routine septoplasty. Tissue β -defensin-2, β -defensin-3, β -defensin-4 and cathelicidin LL37 were detected by immunohistochemical analysis. The results were evaluated by using semi-quantitative method and analysed with the help of Spearman's rank correlation and Mann-Whitney U test.

Results. Group with primary nasal polyps demonstrated significantly decreased number of β -defensin-2 ($p < 0.001$), β -defensin-3 ($p < 0.001$) and LL 37 ($p < 0.001$) positive structures in epithelium and increased number of β -defensin-2 ($p = 0.033$) positive structures in connective tissue when compared to the control group. Group with recurrent polyps also showed decreased number of β -defensin-2 ($p < 0.001$), β -defensin-3 ($p < 0.001$) and LL 37 ($p < 0.001$) positive structures in epithelial cells in comparison to controls. There were no significant differences between groups of primary and recurrent nasal polyps.

Conclusions. Decreased β -defensin-2, β -defensin-3 and cathelicidin LL37 levels in epithelium show impaired antimicrobial function of mucosa in patients with CRSwNP. Increased β -defensin-2 found in subepithelial connective tissue of primary nasal polyps indicates its role in pathogenesis of CRSwNP as well as possible subepithelial invasion of microorganisms.

EVALUATION OF VARIOUS TISSUE FACTORS IN THE BONE OF FIRST AND SECOND TIME PERFORMED SURGERY (OSTEOPLASTY AND RHINOPLASTY) IN CLEFT LIP PALATE PATIENTS

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Objectives. Cleft lip and palate (CLP) deformities are among the most prevalent craniofacial birth abnormalities. The purpose of our research was to ascertain how tissue factors appeared and varied in the bone tissue of CLP patients after primary and secondary bone surgery.

Materials and Methods. Maxillary bone was obtained from CLP patients during osteoplasty or rhinoplasty. The primary operated CLP patients group consisted of 14 patients, and the secondary operated CLP patients group consisted of 22 patients. Immunohistochemistry was performed with: OPN, OPG, OC, IL-1 α , IL-10, HBD-2, HBD-3, BMP2/4, bFGF, TGF- β 1, MMP-2, MMP-8, MMP-9, TIMP-2, Runx2, Wnt3a and the TUNEL method. The semi-quantitative census method was used for the quantification of structures. The Spearman rank correlation coefficient and Mann-Whitney U test were used for the statistical analysis.

Results. The HBD-2, HBD-3, IL-1 α , OC, MMP-2, MMP-9, BMP 2/4, TGF- β and TUNEL demonstrated higher numbers in second time operated patients. There was no difference between the median numbers of IL-10, OPG, OPN, MMP-8, TIMP-2, bFGF, Runx2 and Wnt3a. A significantly higher number of MMP-2 ($U = 95.500$; $p = 0.05$) positive osteocytes were observed in the second time operated CLP patient group, where MMP-2 also showed strong, positive correlations with HBD-2 ($r_s = 0.752$; $p < 0.001$); OC ($r_s = 0.769$; $p < 0.001$); OPN ($r_s = 0.825$; $p < 0.001$); OPG ($r_s = 0.764$; $p < 0.001$); MMP-8 ($r_s = 0.801$; $p < 0.001$); TUNEL ($r_s = 0.712$; $p < 0.001$).

Conclusions. A higher number of IL-1 α , MMP-2, MMP-9 and TUNEL positive bone cells and MMP-2 correlations with MMP-8 and TUNEL in secondary surgery in CLP patients may indicate increased bone degradation and, therefore, more intensive remodeling of the premaxillar bone, probably stimulated by the trauma of the previous surgery as well as growth factors BMP-2/4 and TGF- β . Higher appearance of HBD-2 and HBD-3 in secondary surgery bone material indicate persisting common local immune response.

EXAMINATION OF INFLAMMATORY AND ANTI-INFLAMMATORY CYTOKINES AND FACTORS IN MILK OF DAIRY CATTLE WITH DIFFERENT HEALTH STATUS OF THE UDDER

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Objectives. The aim of this study was to detect various inflammatory and anti-inflammatory cytokines and factors in cattle milk from an agricultural farm and examine the change in the levels of these possible biomarkers between healthy cows and animals with subclinical and clinical mastitis.

Materials and Methods. Based on the health status of each animal in a purebred Polish Holstein Friesian cows herd, fifteen heads of dairy cattle were selected and divided into three groups: five cows were clinically healthy with low SCC in udder quarter milk; five animals with medium SCC were categorized as having subclinical mastitis, and the last five with high SCC had symptoms of clinical mastitis. The following analyses of milk samples were performed: the somatic cell count (LactoScan SCC), bacteriological examination (ISO 4833:2013 standard), and immunocytochemical analysis of inflammatory (IL-1 α , IL-4, IL-6, IL-12, IL-13, IL-17A, TNF- α , and IFN- γ) and anti-inflammatory (IL-2, IL-10, β -defensin-2, β -defensin-3, TGF- β 1, and Cathelicidin LL37), and SPSS for statistical tests.

Results. Both the mean SCC and total bacteria count increased in subclinical and clinical mastitis cases. Milk samples from all animal groups contained *Streptococcus uberis* and *Staphylococcus aureus*, as well as *Streptococcus agalactiae*, *E. coli*, and a total of *Klebsiella*, *Enterobacter*, and *Citrobacter* spp. Both the inflammatory and anti-inflammatory proteins in the milk of healthy cows showed the highest mean positive cell values; thus, IL-2, IL-4, IL-10, IL-12, IL-13, IL-17A, TNF α , IFN γ , β -Def2, and β -Def3 showed a significant difference between healthy and subclinical and/or mastitis-affected animals.

Conclusions. Immunoreactivity for inflammatory IL-12 and INF- γ and anti-inflammatory IL-10 and β -def3 was found to be useful in distinguishing mastitis cases from healthy animals. As a result, these molecules could possibly be used as biomarkers for the early detection of subclinical and clinical mastitis.

EYE-TRACKING – EFFECT OF EXPERTISE AND PREVIOUS EXPERIENCE ON EVALUATION PATTERNS OF DERMATOSCOPIC IMAGES

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Objectives. Eye tracking technology is being used in different domains of life including medicine. Different parameters can be used to draw conclusions about visual cognition processes in response to specific stimuli. It can be speculated that to large extent these parameters rely on persons expertise. Dermatoscopy is a non-invasive diagnostic procedure that is used by dermatologists to evaluate cutaneous lesions. Currently, there are sparse studies on eye tracking in dermatology. Eye tracking can help in understanding how experts and novices process dermatoscopic images, to improve teaching strategies. The aim of our pilot study was to track eye movement of dermatoscopy specialists with different experience and to compare eye movement while assessing images never seen before and the ones already observed.

Materials and Methods. Eye movement of a dermatologist and resident was registered using an eye tracking device *EyeLink 1000 Plus* (SR Research, Canada). Participants assessed 10 dermatoscopic images and determined the diagnosis. Half of the images were seen beforehand. Fixation count, fixation duration and saccade amplitudes were measured and compared between the participants and between images that were seen for the first time, and the ones observed before. Non-parametric statistics was used for data analysis. Fixations were afterwards correlated with dermatoscopic structures.

Results. Resident's fixation duration was significantly longer than dermatologist's (378.4 SD = 69.5 ms *vs.* 307.9 SD = 46.7 ms, $p = 0.021$). Fixation count was lower while observing images that were seen previously (9.6 SD = 6.2 *vs.* 14.9 SD = 6.6), the difference was not statistically significant ($p = 0.065$). Analysis of eye movement patterns revealed certain areas of interest with repetitive fixations.

Conclusions. Less experienced physician tends to have a shorter fixation duration. This contradicts previous findings; however, we believe that areas with repetitive fixations should also be considered during data interpretation. Larger scale studies are essential to draw further conclusions.

FINDINGS OF DIFFERENT TISSUE FACTORS AND APOPTOSIS IN PRIMARY OBSTRUCTIVE MEGAURETER

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Objectives. Primary obstructive megaureter (POM) morphogenesis is not fully known. Some studies showed that there are increased amounts of connective tissue, hypertrophy of outer muscle layer, and atrophy of inner muscle layer in ureteral wall. Very few studies have investigated the immunohistochemical profile of POM. In this study, we evaluate several factors that participate in the regulation of ureters growth and development.

Materials and Methods. The study material was obtained from 11 children aged from one month to 15 years. Three control samples were obtained from children not associated with megaureters from their distal part of the ureter. Apoptosis was detected by terminal dUTP nick-end labeling (TUNEL) reaction. Protein gene product 9.5 (PGP 9.5), nerve growth factor receptor (NGFR), transforming growth factor beta 1 (TGFβ1), fibroblast growth factor receptor 1 (FGFR1), matrix metalloproteinase 2 (MMP-2), angiotensin 2 receptor type 2 (AT2R2), and sonic hedgehog (SHH) protein were detected using immunohistochemistry methods and their relative distribution was evaluated by means of the semiquantitative counting method.

Results. The megaureter material revealed transitional epithelium with scattered vacuolization, submucosa with inflammatory cells, chaotically organized and focally vacuolized muscle layers, and adventitia. Appearance of MMP-2, FGFR1, SHH, and apoptosis prevailed, but TGFβ1 positive cell number was lower in the patient group. Very strong positive correlations were observed between MMP-2 in epithelium and endothelium ($r_s = 0.867$; $p < 0.001$), FGFR1 and MMP-2 in epithelium ($r_s = 0.805$; $p = 0.005$), and TGFβ1 epitheliocytes and fibroblasts ($r_s = 0.942$; $p < 0.001$).

Conclusions. POM morphopathogenesis involves a dynamic apoptotic cell death as well as tissue degradation in epithelium, connective tissue, and blood vessels of the ureter wall. The decrease of tissue growth through diminished TGFβ expression and stimulation of FGFR1 and MMP-2 suggests a disbalance of tissue remodeling in the megaureter wall.

FIRST INTRAVITREAL ANTI-VEGF THERAPY EFFECTS ON CHANGES OF RETINAL VOLUME WITH BEVACIZUMAB FOR WET NEOVASCULAR AMD

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Objectives. Age-related macular degeneration (AMD) is a leading cause of visual impairment and blindness in older adults worldwide. The prognosis for the neovascular type of advanced AMD improved with the introduction of biological drugs with antiangiogenic properties, beginning with off-label bevacizumab, which was first used intravitreally in 2006.

Materials and Methods. In total 31 adults were retrospectively analysed after being diagnosed with wet-form AMD and verifying of compliance with inclusion criteria. Patients were analysed prior to and after first anti-VEGF (Bevacizumab) dose received with OCT Spectralis by capturing their retinal thickness maps, measuring total retinal volume and sub-retinal fluid volume by processing acquired data.

Results. Median decrease of 0.76 mm³, V (7.95%) total retinal volume was achieved after first intravitreal injection. Median sub-retinal fluid decrease of 0.22 mm³, V (2.28%) was seen. Total decrease of intra-retinal volume of 0.54 mm³, V (5.67%) was witnessed.

The results revealed that the average retinal volume decrease amount before and after first anti-VEGF therapy (Bevacizumab) administration with three items ($\alpha = 0.901$) was found reliable. Similarly, a significant positive relationship between average retinal volume decreases $r(29) = 0.904$, $p = 0.000$ to average sub-retinal fluid decreases and a significant correlation between average retinal volume decreases $r(29) = 0.965$, $p = 0.000$ average intra-retinal volume decreases after Anti-VEGF medication admission intravitreally were found.

Conclusions. Anti-VEGF medication administered intravitreally has stronger effects on intra-retinal volume decrease compared to sub-retinal fluid decrease after the first dose. According to studies of currently known development course of the pathology, first time of medication administration is the most effective to evaluate long-term development of vision endangering choroidal neovascularization (CNV) with further intra-retinal or sub-retinal fluid leakage, hemorrhage, and retinal pigment epithelium detachments (RPED).

FREQUENCY OF RECURRENT ATRIAL FIBRILLATION PAROXYSMS AGAINST THE BACKGROUND OF THE USE OF VARIOUS ANTIARRHYTHMIC DRUGS IN THE PRACTICE OF FAMILY (GENERAL PRACTICE) DOCTOR

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Objectives. The aim of the study was to evaluate and compare the effectiveness of propafenone, aethacizin and sotalol on the recurrence rate of atrial fibrillation (AF) paroxysms in patients in general practice.

Materials and Methods. The retrospective analysis was performed on 57 patients (38 male and 19 female, median age 63.5 ± 12 , range 37–78) who had previously been prescribed therapy by specialists and had at least one recurrent AF paroxysms in the last four months. The patients were divided into three groups – I group of patients were treated by propafenon p/o (25 patients – 43.9%), II group of patients were treated by aethacizin p/o (17 patients – 29.8%) and III group of patients were treated by sotalol p/o (15 patients – 26.3%). Since the beginning of the therapy, in case of AF paroxysm, the patient went to the emergency department, notifying the family doctor.

Results. During propafenon therapy no recurrent AF paroxysms were registered in 20 of 25 patients (80.0%). The average dose of propafenon was p/o 300 ± 150 mg/d. During aethacizin therapy no recurrent AF paroxysms were registered in 13 of 17 patients (76.5%). The average dose of aethacizin was p/o 100 ± 50 mg/d. During sotalol therapy no recurrent AF paroxysms were registered in 7 of 15 patients (46.7%). The average dose of sotalol was 160 ± 80 mg/d.

Conclusions. Efficacy of propafenon and aethacizin in reducing the frequency of AF paroxysms was almost the same. The effect of propafenon was slightly superior that of aethacizin. The effect of sotalol was less than of ethacizine. Dosages of medication should be taken into account in order to choose the appropriate treatment. The level of severity of antiarrhythmic drugs varies, each of which may be useful depending on the counter-indications for a particular patient.

GENERAL ANAESTHESIA WITH DEXMEDETOMIDINE IS SAFE AND EFFECTIVE IN PELVIS OSTEOSYNTHESIS TRAUMA PATIENTS

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Objectives. Dexmedetomidine (Dex) sedative, analgetic effects might be desirable during general anaesthesia. Aim was to evaluate efficacy and safety of Dex for general anaesthesia in patients undergoing pelvis osteosynthesis.

Materials and Methods. In prospective single-blinded trial ASA II trauma patients were randomly assigned to general anaesthesia with Phentanyl (Ph-GA) or Phentanyl with Dex (Ph-DEX-GA) groups. Ph-DEX-GA received Dex 1 mcg/kg/h over 10 min after intubation, followed by infusion 0.4 mcg/kg/h until end of surgery. Mean atrial pressure (MAP), heart rate (HR) was recorded after intubation (T0), after one (T1), after two (T2) hours, after extubation (T3). Pain intensity (NRS) was analysed 0, 6, 12 and 24 h postoperatively.

Primarily we assessed pain intensity after surgery and total intraoperative Phentanyl consumption. Secondary, influence on haemodynamic (MAP < 65 mm/Hg or bradycardia < 50 x/min). P < 0.05.

Results. Preliminary 18 patients: Ph-GA (n = 9), Ph-DEX-GA (n = 9), mean age 51.5 ± 9.9 years were collected. Mean duration of surgery (244 ± 91 min) and anaesthesia (314 ± 99 min) in both groups were similar.

Pain at rest after surgery was similar: Ph-GA vs. Ph-Dex-GA: T0 2.4 vs. 2.6, T6 2.9 vs. 3.4, T12 2.8 vs. 3.2, T24 2.6 vs. 2.9, though Phentanyl consumption during surgery was lower in Ph-DEX-GA group 0.28 ± 0.1 mg vs. 0.7 ± 0.2 mg.

More pronounced effect to hemodynamic was observed in Dex group. Drop from baseline of MAP Ph-GA vs. Ph-Dex-GA: T1 -14.9% vs. -26.3%, T2 -16.4% vs. -29.2%, T3 -6.6% vs. -14.6%; HR Ph-GA vs. Ph-Dex-GA: T1 -12.3% vs. -19%, T2 +6.8% vs. -29.2%, T3 -5.2% vs. -22%. Treatment for intraoperative hypotension (ephedrine 5–10 mg) received 5 patients - 4 in Ph-Dex-GA and 1 in Ph-GA group.

Conclusions. Dex for general anaesthesia is effective and safe, by reducing Phentanyl consumption provides good pain control in pelvis osteosynthesis patients. However, it potentially leads to greater hemodynamic fluctuations.

GENETIC CHARACTERISATION OF RETINOBLASTOMA IN LATVIA FROM 2000 TO 2022

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Objectives. The purpose of the study is to summarize changes in genetic structure of patients with diagnosis of retinoblastoma in Children's Clinical University Hospital of Latvia since 2000. This 22 -year period is characteristic with wide range spectrum of genetic test availability as well as the changes of genetic testing methods over time. Such description of genetic *RB1* gene characterization of Latvian patients with retinoblastoma has not been performed so far.

Materials and Methods. A retrospective study of all retinoblastoma patients diagnosed and treated in Children's Clinical University Hospital since 2000. Clinical and molecular diagnostics' findings from 25 patients were collected from medical cards and hospital's internal data system.

Results. patients were diagnosed with retinoblastoma between 2000 and 2022. *RB1* gene was tested for 68.0% (n = 17) of them. Genetic testing methods over 22-year period were starting with Sanger sequencing followed by Next generation sequencing (NGS) gene panels with or without Copy number variants (CNV), to NGS testing for single *RB1* gene with CNV. In 64.4% (n = 11) of tested patients pathogenic or likely pathogenic variant in *RB1* gene (*RB1* positive) was found – 3 missense, 3 nonsense genetic variants, 3 intragenic deletions/duplications and 2 large deletions including *RB1* gene. One missense variant was recurrent for 2 unrelated patients. For 1 affected patient mosaicism of intragenic deletion was found. All patients with bilateral retinoblastoma (n = 7) were *RB1* gene positive. All *RB1* positive patients were younger than 2 years when they were clinically diagnosed. Three families with 2 affected individuals in each family were identified.

Conclusions. Corresponding to literature patients with bilateral retinoblastoma and familial cases are always *RB1* gene positive. Even not found in first line investigation it is worth to check large deletions and duplications or mosaicism. *RB1* gene status affects age of onset and disease recurrence rate in the family.

GLANDULA PAROTIS ARTERIOVENOUS MALFORMATION ENDOVASCULAR TREATMENT

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Objectives. Arteriovenous malformation (AVM) of the parotid gland (PG) is an extremely rare and there are only few cases reported in literature.

A 46-year-old male was hospitalized with complaints about a pulsatile right cheek mass, tinnitus in the right ear and the pain that irradiate to the oral cavity. A swelling in front and below the right ear occurred spontaneously three years ago and gradually progressed in size.

Duplex ultrasound of the right parotid region revealed enlarged PG with blunt contours, non-homogeneous echogenicity and hypo-vascular zones. A compressible swelling, comprising of tubular channels showed mixed flow on color Doppler, suggestive of an AVM.

MRI of the right parotid region showed enhancing tubular structures involving the right parotid gland which was also suggestive of a AVM.

Pre-treatment Digital Subtraction Angiography (DSA) was used to evaluate blood supply of AVM, endovascular treatment option.

After patient agreement under general anaesthesia, through right common femoral artery introducer sheath, selective angiography of right external carotid artery was performed. In right PG localization pathological hypervascular structure with fast arteriovenous flow and drainage in venous system was catheterized with microcatheter and embolized with precipitating hydrophobic injectable liquid. In postembolization angiography there was no early venous flow.

Patient was discharged on the next day without complaints about tinnitus in the right ear.

Conclusions. Intraglandular AVM is an extremely rare parotid gland pathology.

Endovascular access is effective and safe method for intraglandular AVM treatment.

The use of iodinated precipitating hydrophobic injectable liquid is feasible and effective for trans-arterial embolisation of parotid gland arteriovenous malformation

HISTOPATHOLOGY OF FLAIR HYPERINTENSITY ZONE AND CANCER STEM CELL DISTRIBUTION BETWEEN ENHANCING NODULE AND FLAIR HYPERINTENSITY ZONE IN GLIOBLASTOMA, IDH-WILD TYPE: SINGLE-INSTITUTION EXPERIENCE

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Objectives. The fact that higher expressions of cancer stem cell (CSC) markers were reported at the infiltrating tumor edge of glioblastoma (GBM), along with the evidence that GBM recurrences often arose from peritumoral areas, increased the need to pay more attention to “what was going on around the tumor”. Moreover, as little is known about the histopathologic composition of the radiologically-defined FLAIR hyperintensity zone, we investigated the histopathologic features, along with the distribution of SOX2+ and CD133+ CSCs, both in the central core (Enhancing Nodule; EN) and in the FLAIR hyperintensity zone of a series of 33 GBMs, *IDH-wild type*.

Materials and Methods. Our cohort included 20 males and 13 females (mean age: 56 years). The inclusion criterion was the intraoperative sampling of EN and FLAIR regions identified by Neuronavigation and by the use of 5-ALA. The immunoexpression of SOX2 and CD133 was semiquantitatively evaluated.

Results. Histologically, EN regions exhibited the conventional GBM morphology with hypercellularity, increased mitotic activity, necrosis and/or microvascular proliferation (MVP) in 29/33 cases; the ENs of 4/33 cases lacked necrosis and MVP and the diagnosis of GBM was mainly molecularly-based. Histological samples from FLAIR regions showed fragments of white matter tissue focally to diffusely infiltrated by GBM cells in 25/33 cases; neither necrosis nor MVP were seen within these samples. FLAIR regions from 5/33 cases exhibited a mixture of white matter with reactive astrogliosis, along with grey matter with neuronal satellitosis. The FLAIR zones from 3/33 cases showed viable tumor tissue with necrosis and MVP. No significant difference in the quantitative distribution of SOX2 and CD133 immunoexpressions between the EN and FLAIR regions was found.

Conclusions. Based on our results, an interesting future perspective of the present study would be to recalibrate both the surgical and radiotherapy target in GBM to improve the local control of the disease.

HISTORICAL LEARNING TOOL FOR ANATOMY IN THE COLLECTION OF RĪGA STRADIŅŠ UNIVERSITY MUSEUM

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¹RSU History Museum

²National History Museum of Latvia

Objectives. Identification of origin and use of RSU museum item “The Vegetative Nervous System Model No 9”.

In 2008, the object was given to RSU Museum by the Institute of Anatomy and Anthropology. It is included in the collection “Historical teaching aids” and has been exhibited in the RSU Museum permanent exhibition since 2013. In 2022, a restoration of the metal parts of the model was carried out and at the same time, an in-depth study of its origin and use was decided.

Materials and Methods. Historical research and comparison methods – interviews of RSU current and former teaching staff and museum specialists of the former USSR republics.

Results. “Vegetative Nervous System Model No 9” was made in the middle of the 20th century in the Georgian SSR. It was one of about ten different models of the nervous system produced there. In the 50-60s, it was a teaching tool at Riga Medical Institute.

During the restoration, it was discovered that the model was made in an unusual technique – made of steel wire and wood that is covered in plaster and painted in multiple layers. Due to its constructive complexity, it is visually difficult to perceive.

Similar teaching aids have been identified in several medical educational institutions of the former USSR, however, information on their practical use in the study process has barely remained.

Conclusions

1. “Vegetative Nervous System Model No 9” and other teaching aids of this series have been common in many USSR medical education institutions.
2. Due to its constructive complexity and size, they have not been widely used in the teaching process.
3. These models, as a unique and visually effective evidence for the history of medical education are stored in the RSU Museum collection.

HYDROXYAPATITE CRYSTAL DEPOSITION DISEASE WITH MULTIPLE JOINT INVOLVEMENT RESULTING IN SPINAL CANAL SEVERE STENOSIS: CASE REPORT

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Objectives. Keywords. Calcium Apatite Deposition Disease; Milwaukee shoulder; Calcific enthesopathy

Introduction. Hydroxyapatite crystal deposition disease (HADD) is a condition characterised by periarticular and intra-articular calcium deposits in surrounding soft tissue with an accompanying inflammation. Etiology is uncertain, common predisposing factors include repetitive microtrauma, ischemia and other diseases such as renal failure. Commonly, the glenohumeral joint is affected. Other locations include elbow, wrist, knee, foot, and spine. The presence of a typical calcified deposit seen on CT and/or MRI is sufficient to establish the diagnosis of HADD.

Case description. A 34-year-old male admitted to the hospital after suffering from a recurrent fever and elevated inflammatory markers for the past few months. The patient has a history of chronic kidney disease treated with hemodialysis; anabolic-androgenic steroid use; multiple calcium depositions along glenohumeral, iliofemoral joints bilaterally, left foot and lumbar spine. Conservative analgesic and empiric antibacterial therapy was ineffective. Non-enhancement CT showed hyperdense calcifications in soft tissue along lumbar spine with minimal intraspinal localization. Over the course of a few weeks, symptoms worsened, the patient presented with lower back pain that radiated to legs, progressive weakness of legs, paraparesis without sensory deficit. MRI scans showed hypointense periarticular lesions with fluid levels on both T1 and T2 weighted images from L1 to L3 extending intraspinally with severe spinal canal stenosis, medullary cone compression. The patient was admitted to Neurosurgery unit and underwent resection of lumbar calcified depositions. On pathologist's report excisional biopsy showed chronic inflammation with calcification.

Summary. The reported case demonstrates severe spinal stenosis, a rare complication of HADD, seen on MRI, with paraparesis and an effective treatment with neurosurgical resection.

Conclusions. HADD can cause local inflammation, swelling and compression causing severe pain and immobility. Described patient had an increased risk of crystal deposition development due to chronic kidney disease and history of anabolic-androgenic steroid use.

IATROGENIC CHYLOUS ASCITES: CASE REPORT

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Objectives. Chylous ascites (CA) is a rare condition due to malignancy, cirrhosis or lymphatic disruption after abdominal surgery. Patients should receive low-fat diet and orlistat, somatostatin as first line, combined with minimal invasive interventions. Surgical is the last intervention. Aim is to present iatrogenic chylous ascites as a rare complication after lymph node biopsy.

A 42-years-old female was admitted to university hospital in intensive care unit (ICU) due to refractory ascites, acute renal failure and severe electrolyte imbalance in November 2022. It is known that patient had anamnesis of asymptomatic chronic virus hepatitis C (2004) and radical hysterectomy (2019). Two-months prior hospitalization patient underwent laparoscopic intrabdominal lymph node biopsy (August 2022). Not either malignancy in uterus not in lymph nodes where histologically confirmed. One week after the biopsy increasing fatigue and abdominal swelling appeared. Patient was repeatedly four times admitted to the hospital over a seven-week period and ascites 25 liters was evacuated. Nevertheless, condition continued to deteriorate.

At current hospitalization the patient with suspected sepsis, acute renal failure, massive chylous ascites was admitted in ICU with severe hypoalbuminemia (14.2 g/L) presenting general edema and severe exicosis, with critical urea, potassium, Hb and Creatinine values. Laparocentesis revealed milky-white ascites (plasma triglyceride ratio 4:1) without malignant cells and negative culture. Length of stay in ICU was 1.5 months, where patient received low-fat diet, somatostatin, parenteral nutrition, electrolyte correction and rehydration. Lymphangiography, lymphoscintigraphy and diagnostic laparoscopy not succeed to find the area of lymph leakage. For one month the patient lost 63 liters of lymph through laparocentesis. Now a peritoneovenous shunt is considered as the next step. The main challenge of this case was to identify the iatrogenic rupture in the lymphatic system and to precisely compensate loss of lymph in major amounts consisting of high concentration of life threatening substances.

IMMUNOHISTOCHEMICAL ANALYSIS OF LYMPHOID NODULES OF THE SMALL INTESTINE IN WHITE RATS WAS NORMAL

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Objectives. Peyer's patches are an integration of many individual lymphoid nodules, localized mainly in T- and B-lymphocytes. Furthermore, their key structure is where the immune response is initiated, their apical part is a different types of enterocytes, mainly including absorptive cells, goblet cells, and so-called M-cells.

The aim of this study was to perform immunohistochemical analysis and to elucidate those areas of primary localization of major immune cell types in Peyer's plaques of the small intestine of albino rats that were normal.

Materials and Methods. 10 adult male albino rats 200.0 ± 20.0 g were included in this study. A portion of the small intestine with Peyer's patches was used. In order to detect the immunohistochemical (IHC) characteristics of Peyer's patches, the material was fixed with 10% neutral formalin for 24 hours, embedded in paraffin, the section thickness was 4 μ m, and fixed on high-adhesion Super Frost glass, and at a temperature of 37°C for 18 hours. Exposure heat treatment was performed by boiling the test pieces in citrate buffer (pH 6.0). Ultra Vision Quanto Detection System HRP-Polymer is used to visualize the primary antibody detection system. It is used as the chromogen-DAB (diaminobenzidine).

By T-cell and B-cell differentiation clusters (CD3, CD79), plasma cell markers (CD38), macrophage markers (CD68 KP1)), a dendritic cell marker (CD23), a PAN cytokeratin Epithelial cell marker for protein (cytokeratin PAN-AE1/AE3). Used primary monoclonal antibody (moAb) from Thermo-Scientific (Germany). Results are calculated from 10 randomly selected fields of view at 400X-magnification using the Avtandilov eyepiece grid.

Results. Immunohistochemical Peyer's patches of the small intestine of intact animals yielded general data on the quantitative relationships between the major immune cell populations contained therein.

Conclusions. The immunocompetent cells are dominated by B-lymphocytes (about 47%) and T-lymphocytes (about 35%), plasma, dendritic cells, and macrophages each for about 5%.

IMPACT OF EARLY PLEURAL EFFUSION ON OXYGENATION AND TROPONIN I LEVELS AFTER CARDIOPULMONARY BYPASS

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Objectives. Lung impairment and respiratory failure is common complication after cardiopulmonary bypass (CPB). Pleural effusion is one of the most common lung complication after heart surgery. The aim of this study is to determine whether patients with pleural effusion in early postoperative period present respiratory and cardiac distress compared to patients with normal CT scan.

Materials and Methods. 36 patients after open heart surgery under CPB were included in the study. Cardiac lesion and respiratory function assessment included troponin I level and oxygen partial pressure evaluation. CT scan was performed 24 hours after surgery to detect presence of pleural effusion. Data were analysed using IBM SPSS statistics 27.

Results. 36 patients with mean age 66 (SD = 11) years were included in the study, 8/36 of them were female. 29/36 had CT scan 24 hours after surgery. 47% (n = 17) patients had pleural effusion with maximum of 3.5 cm on CT scan 24 hours after the surgery. In 15/36 patients pleural effusion was bilateral. There was no significant change in oxygenation level (Mann-Whitney U test, p = 0.265) or troponin I level (t – test; p = 0.184) between patients who had pleural effusion and patients without it.

Conclusions. Our study data shows no association between troponin I levels, oxygenation and presence of postoperative pleural effusion. Larger cohort should be evaluated to assess pleural effusion impact on respiratory function and cardiac lesion parameters in early postoperative period.

IMPORTANCE OF ASSESSING FUNCTIONAL STATUS OF AT-RISK SENIORS IN INSTITUTIONAL FACILITIES

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Objectives. Institutional care, especially if it is unplanned, poses a risk for seniors due to maladaptation syndrome. The problem could be more serious if the seniors are multimorbid or have one or more geriatric syndromes. A necessary condition for risk elimination is a comprehensive geriatric assessment. By evaluating and identifying at-risk seniors, we can prevent or reduce serious complications. Through the KEGA project Nutrition and physical activity as the basic pillars of care for at risk patients, we also focus on identifying the mentioned problems as well as on their mitigation through appropriate intervention.

Materials and Methods. The evaluation tools are: nutritional anamnesis, Hand Grip test, MNA and Barthel's test (ADL), Physical fitness assessment test for seniors, Karnofsky index and when the problem is identified, a laboratory test (albumin, proteins...). A pilot study is currently underway, which is carried out in selected departments and clinics of the Central Military Hospital in Ružomberok SR. With the above tools, we identify nutritional deficits, impaired self-care and mobility during the hospitalization of patients. Subsequently a competent member of the team is prescribed intervention. The team members are an attending physician, a geriatrician, a nurse, and a physiotherapist. Nursing and physiotherapy students collaborate in data collection. We record the effect of care during hospitalization and discharge of patients.

Results. Of the data collected so far – 80 patients, 30% were in malnutrition, 45% were at risk of malnutrition. With the ADL test, we found 25% high dependence, 40% medium dependence. The Karnofsky index was WHO grade 1–3. The implemented interventions were diet adjustment, sipping, patient education, enteral, partial parenteral nutrition, nursing rehabilitation and rehabilitation.

Conclusions. The results so far have confirmed the importance of interdisciplinary care in high-risk patients. Likewise, the interdependence of nutrition and functional fitness in seniors. Seniors with malnutrition are at risk of complications in institutional treatment.

INCIDENTAL DETECTION OF LEFT-SIDED ZINNER SYNDROME IN A PATIENT WITH HEMATURIA – FIRST EVER CASE PRESENTATION IN LATVIA

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Objectives. First discovered in 1914 Zinner syndrome is a very rare condition (200 cases reported) caused by compromised embryologic development of the Wolffian (mesonephric) duct. The congenital anomaly is a triad of unilateral renal agenesis, ipsilateral seminal vesicle cyst and an ejaculatory duct obstruction, more commonly diagnosed on the right side of the body. Patients are often misdiagnosed which can lead to constant perineal pain or even infertility.

A 26-year-old male patient was admitted to the emergency department with complaints of hematuria and dysuria after unprotected *coitus*. He was referred to the urologist. Basic laboratory tests were done which showed no deviation of normal values except for serum creatinine (122 mmol/L). STD panel was positive for *Chlamydia* infection. Ultrasound of abdomen revealed first grade hydronephrosis. Next, non-enhanced CT scan showed an absence of the left kidney, enlarged right kidney and an enlarged left seminal vesicle permeating into the urinary bladder. Patient was discharged from the hospital with recommendations that included antibacterial therapy for chlamydiosis, MRI of small pelvis with intravenous contrast, repeated visit with the urologist to perform a lower urinary tract endoscopy.

MRI scan revealed enlargement of left seminal vesicle with cystic inclusion containing hemorrhagic substance, creating a permeation in urinary bladder, ejaculatory duct was enlarged as well. During the lower urinary tract endoscopy, a large bump was seen on the left side of urinary bladder which correlated with the findings in MRI, also no signs of left ureteral opening were observed. Diagnosis of Zinner syndrome was made and patient was discharged with recommendations for further treatment plan with surgery as an option.

Conclusions. This case report highlights a rare case in Latvia, presenting high infertility potential if left untreated. Rariness of this syndrome presents diagnostic difficulties for practicing radiologists and urologists.

INSIGHT INTO LATVIAN AMYLOIDOSIS REGISTRY FROM 2020 TO 2022

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Objectives. To analyze diagnosis and treatment trends of amyloidosis patients in Latvia since the beginning of amyloidosis patient registry.

Materials and Methods. A country-wide ongoing observational cohort study was started in January 2020 with long-term follow-up in patients referred to Pauls Stradiņš Clinical University Hospital. Inclusion criteria were any type of systemic or localized amyloidosis confirmed by tissue biopsy with Congo Red stain or positive 99mTc-PYP cardiac scintigraphy scan for transthyretin (ATTR) amyloidosis and informed consent given by the patient.

Results. From January 2020 to December 2022 the registry had enrolled 40 patients; 13 patients died during the follow-up period. 10 (25%) patients had AA amyloidosis, 19 (48%) had light chain (AL) amyloidosis (5 – local, 14 – systemic), 4 (10%) – ATTR, one patient had lysozyme amyloidosis. In 6 cases, the amyloid type was not identified. Registered AL cases increased from 6 in 2020 and 3 in 2021 to 10 in 2022. Clinically manifested renal involvement was present in 26 (65%) patients, cardiac in 13 (33%), sensorimotor polyneuropathy in 7 (18%), autonomic dysfunction in 8 (20%). In AL patients, 10 received anti-plasma cell treatment. Two received specific ATTR therapy.

Conclusions. Latvian amyloidosis patient cohort demonstrates predominance of AL amyloidosis but is still largely skewed towards AA amyloidosis in comparison with Western countries, likely because of active conduction of kidney biopsies in proteinuric patients. Since the onset of registry, diagnosis of AL has increased possibly due to growing awareness of the disease and referral to specialists. ATTR remains largely unrecognized and underdiagnosed partly due to lack of reimbursed treatment.

INTERRELATIONSHIP OF INFLAMMATION AND REMODELLING-RELATED FACTORS IN OSTEOARTHRITIS

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Objectives. Osteoarthritis (OA) is the most prevalent form of arthritis characterized by the damage of articular cartilage, extracellular matrix remodeling, as well as various degrees of inflammation. We aimed to analyze the expression of inflammation and remodeling-related factors in the synovial membrane of patients with OA.

Materials and Methods. Twenty OA surgery synovial tissue specimens were used in the study. The sections were stained with hematoxylin and eosin, and the histopathology in the synovial membrane was analyzed according to Krenn *et al.* grading system. Additionally, the expression of NF-kBp65, TNF- α and MMP-9 were assessed. The Jamovi 2.3.19. program was used for statistical data analysis.

Results. The severity of synovial inflammation was evaluated as 4 (IQR 3–6), consistent with low-moderate grade synovitis. The hyperplasia of the lining layer was not prominent. The cellular density and infiltration of inflammatory cells as well as angiogenesis in the sublining layer were low to moderate. The statistically significant difference in the expression of NF-kBp65 was established when low-grade (15.9 ± 16.5) and high-grade (58.2 ± 35.6) synovitis groups were compared comprising 42.2, 95% CI [22.6–61.9], $t(25.4) = 4.43$, $p < 0.001$, $d = 1.52$. Similarly, the statistically significant difference in MMP-9 expression was established when the same groups were compared – low-grade (median = 5, IQR 4–8) and high-grade (median = 18.5, IQR 14–25.75) synovitis groups, $U = 30$, $p < 0.01$, $r = 0.744$. Moreover, the positive correlations between NF-kBp65 and MMP-9 and TNF- α and MMP-9 expression within synovial tissue were established ($p < 0.001$).

Conclusions. The study results suggest OA commonly is characterized by low-grade inflammation. The severity of inflammation in the synovial membrane is linked to other processes of the entire joint. The expression of inflammatory factors reveals a positive correlation with the expression of tissue remodeling-related factors, and further contributes to the progression of OA.

IS CEREBRAL DEOXYGENATION ASSOCIATED WITH POOR OUTCOME IN PATIENTS WITH ANEURYSMAL SUBARACHNOID HEMORRHAGE?

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Objectives. Morbidity and mortality after aneurysmal subarachnoid hemorrhage (aSAH) reaches up to 60% in first 6 months. Current evidence does not support use of regional cerebral oximetry (rSO₂) in clinical decision making. Our aim was to observe the impact of cerebral desaturation detected by rSO₂ to outcome in patients with aSAH.

Materials and Methods. From January 2020 to September 2022 cerebral rSO₂ was provided to 23 aSAH intensive care patients Riga, Latvia. Monitoring was started within first 72 hours after ictus and continued up to 7 days. Cerebral deoxygenation was defined as cerebral rSO₂ reduction > 20% from baseline for at least 30 minutes. As an outcome we analysed the impact of cerebral desaturation to intrahospital mortality and degree of disability according to modified Rankin Scale (mRS) on the day of check-out.

Results. In our preliminary study totally 23 patients (74% females) with mean age of 62 ± 11 years was analysed with median Glasgow Coma Scale 13 points (5–15) at admission. Overall mortality was 35%. Cerebral deoxygenation occurred in 57% of cases. Three quarters of died patients (75%) presented cerebral deoxygenation vs. those who survived (46%), but without statistical significance; $p = 0.19$. In surviving patients with poor neurological outcome (mRS 4–5), cerebral deoxygenation was fixed in 56% vs. 33% with good neurological outcome (mRS 1–3) ($p = 0.4$). Good functional outcome of survivors was in 40% (mRS 1–3), but in 60% mRS was 5 points.

Conclusions. However not direct impact of cerebral deoxygenation detected by cerebral rSO₂ was found on outcome, results showed that cerebral rSO₂ as an additional tool in multimodal neuromonitoring may provide predictive information for outcome in aSAH patients since most of patients those who died had cerebral deoxygenation during the first week.

MALE (AGE GROUP 20–40) KNOWLEDGE AND AWARENESS OF TESTICULAR CANCER AND TESTICULAR SELF-EXAMINATION

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Objectives. In Latvia every year an average of 35 men are diagnosed with testicular cancer, often in late stage. Delayed diagnosis may be associated with patients lack of knowledge about this disease and lack of knowledge about the need for testicular self-examination. The objectives of the study are to clarify the knowledge of young men regarding testicular cancer and testicular self-examination and to promote the knowledge of the participants of the study, regarding the disease.

Materials and Methods. A descriptive cross-sectional study was carried out in Riga and Saldus municipality, Latvia from November 2021 till March 2022. An anonymous questionnaire was distributed among randomly selected 300 male patients (aged 20–40 years) in two family medicine practices, 150 patients per practice. The data was analysed using IBM SPSS program.

Results. Only 33.33% questionnaires were completed (n = 100). Among all respondents 30% have never heard about testicular cancer and only 8% declare that they are aware and alert about this diagnosis. Half of respondents (51%) have never searched for information regarding men's health topics. However, 9% of respondents have searched for information specifically about testicular cancer at least once in their lifetime. Only 16% agree to the statement that testicular cancer is the most common oncology among young men. Out of 100 respondents 65 think that the first and main symptoms of testicular cancer are pain and swelling in affected testicle or in whole scrotum. Majority of respondents (69%) have never performed testicular self-examination and only 11% of respondents affirm that they know how to perform it step by step.

Conclusions. Our data imply that knowledge and awareness of 20–40 years old Latvian men regarding testicular cancer and testicular self-examination are insufficient.

MANAGEMENT OF HIGH-RISK MELANOMA PATIENT USING TWO-STEP APPROACH

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Objectives. Total body mapping (TBM) comprises photographic documentation of the entire body surface. Total body photography (TBP) is followed by digital dermatoscopy (DD) of selected melanocytic lesions. A 2-step approach combining both can facilitate the detection of new lesions or early macroscopic changes in existing lesions.

We present 50 years old man with pigmented nodular lesion on his left shoulder, which had started bleeding for a short time. No family history of melanoma, sunburns during adulthood. Patient had multiple polymorphic nevi on his body (> 1000). Clinical and dermatoscopic examination showed thick melanoma criteria. Excisional biopsy was performed. Morphology – melanoma pT2aN0M0 IB stage, Breslow 2 mm, Clark III. First TBM session was performed on December 2019, the next two with an interval of 3 months. Lesion on back was excised with result melanoma *in situ*. The next TBM was performed with an interval of 6 months. High magnification DD was performed for a new lesion on his right hip 1.32 mm x1.28 mm with peripheral globules. Another lesion on his left leg with changes was excised with result spitzoid melanoma Breslow – 0.2 mm. Follow up for the nevus on right hip – no more peripheral globules in 3 months. TBM after 3 months – new nevus on patients abdomen with peripheral rim of globules, additional high magnification DD was performed – peripheral globules symmetric and regular.

A 2-step approach combining TBP and DD is currently the best for monitoring patients at high risk for melanoma. This combination significantly improves the management of patients, that would be difficult without these technologies. Diagnosis of melanoma in such cases would be possible when the tumor is in an invasive stage. New lesions with signs of growth at 50 years of age do not always mean malignancy.

MATERNITY HOSPITALS IN LATVIA (DAUGAVPILS) DURING THE SOVIET PERIOD

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Objectives. In the wake of World War II, there was a nearly half-century long period of Soviet occupation in Latvia (1945–1990). There were fundamental changes to the country's health care system so as to adapt it to the Soviet system of medicine. Hospitals were opened in every small town, particularly around 1951 and 1952. Maternity hospitals were opened in larger cities, including Daugavpils, Jelgava and Liepāja.

Materials and Methods. The purpose and innovation of this research project is to examine health care in Soviet Latvia. So far it has not been studied much because not enough time had passed since the occupation. Soviet-era documents are stored not just in Riga, but also in zonal state archives. If these aspects of the history of medicine are not systematised, then soon we will not remember that maternity hospitals did not only exist in the capital city.

Results. The Daugavpils Maternity Hospital was open from 1951 until 1988, and it was in a building that was formerly run by the Latvian Red Cross. After the restoration of Latvia's independence, there was another round of reorganisation in the health care system, and maternity hospitals outside of Rīga were shut down in the sense that they were added to other hospitals as maternity wards. Interestingly, a plaque was put up on the wall of the old Daugavpils maternity hospital in 2022 in honour of Dr Elina Rone (1920–2011), who spent more than 30 years working in Daugavpils and was the director of the maternity hospital from 1963 until 1973. Dr Rone received the highest award in the Soviet Union, the Order of Lenin, for her enormous investment in maternity care in Daugavpils.

Conclusions. Today in Latvia maternity wards are only found at the largest regional hospitals. The only dedicated maternity hospital is in Riga, and it was established in 1947.

MIDDLE EAR ADENOMA

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Objectives. Introduction. Middle ear neuroendocrine adenomas are very rare neoplasms, accounting for less than 2% of all middle ear and inner ear tumours. Despite diagnostic imaging being widely available nowadays, diagnosis can be challenging due to non-specific findings and the rare occurrence. The surgeon can still be surprised by the intraoperative findings and the results of histological examinations in the postoperative period.

Case presentation. A 48-year-old woman turned to an otorhinolaryngologist with complaints of discomfort and a feeling of fullness in her right ear. Pure tone audiometry and tympanometry were performed, without pathological findings.

After one month, the patient undergoes a CT scan of the pyramids. Following the CT scan, the patient repeatedly consults an otorhinolaryngologist, the patient denies new complaints. Surgical therapy is appointed. Right ear surgery was performed – excision of the formation, revision of the tympanic cavity and tympanoplasty.

The result of histological examination (haematoxylin-eosin staining method): The morphological and immunohistochemical picture is consistent with an adenoma with neuroendocrine differentiation.

MRI examination after surgery and pure tone audiometry and tympanometry were performed.

Conclusions:

- We present the details of a rare case of neuroendocrine adenoma of the middle ear, accounting for less than 2% of all middle ear and inner ear tumours.
- Middle ear adenoma usually present with nonspecific clinical findings
- A diagnosis is often delayed due to the rarity of this tumor, and biopsy is usually needed to reach a definite diagnosis.
- A pathological examination is required to differentiate middle ear neuroendocrine adenoma.
- Preoperative radiological findings does not always correlate with intraoperative findings and clinical symptoms.
- Surgical treatment is main therapy, adjuvant radiotherapy and chemotherapy is not recommended.
- ENT surgeons should keep an open mind and be prepared to change their plan during surgery according to intraoperative findings.

MINDFULNESS-BASED DANCE MOVEMENT THERAPY – MIXED METHODS’ SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives. To assess the effects of mindfulness based dance movement therapy (MBDMT) on health-related psychological outcomes of people in comparison to no treatment, standard care or any other treatment for indicators included in the meta-analysis and indicators not included in the meta-analysis; to explore the experience of mindfulness based dance movement therapy’s participants; to examine mechanisms of change in MBDMT.

Materials and Methods. A comprehensive search by two independent researchers was conducted from March 2022 to September 2022, including “gray literature”. Inclusion criteria: full-text quantitative, qualitative or mixed design study in English or Latvian, intervention being tested had to be MBDMT and conducted by a dance movement professional or specialist in training. Exclusion criteria: literature reviews, education programs and case studies. Two researchers independently appraised methodological quality of trials using the Mixed Methods Appraisal Tool, version 2018. Adapted Cochrane Collaboration tables were used in data extraction process.

Results. Five quantitative and two qualitative design studies were included. The results of the meta-analysis indicate an average reduction in pain intensity of 1.58 points (95% CI: [-2.48, -0.68], overall effect $Z = 3.45$ ($P = 0.0006$)) and emotion regulation skills revealed improvement of 0.52 points (95% CI: [0.26, 0.79], overall effect $Z = 3.88$ ($P = 0.0001$)). The analysis of quantitative and qualitative data provides indications of positive effects on pain relief, body awareness, mindfulness experience and emotion regulation skills. Forty mechanisms of change were identified forming conceptual framework of six basic therapeutic mechanisms: creation of space/environment, body awareness, re-perceiving, therapeutic process, development of skills, insight/enlightenment.

Conclusions. Based on studies with high to high with minor limitations methodological quality, it is concluded that MBDMT is an effective intervention for chronic pain patients and a feasible and promising therapy approach for treatment of adults in psychiatry and oncology.

MODERN FLUORESCENCE MICROSCOPY – TOOL TO SEE THE NANO-DETAILS OF LIFE

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Objectives. Modern fluorescent microscopy can overcome resolution limitations imposed by the diffraction barrier and can produce spatially super-resolved, time-resolved, and 3D images of biological samples. In this report we demonstrate the microscopy capabilities available at the Latvian Institute of Organic Synthesis/Baltic Biomaterials Centre of Excellence.

Materials and Methods. Images and data sets of fluorochromes were acquired on confocal Leica STELLARIS SP8 Super-resolution STED microscope using HC PL APO CS2 86x/1.40 water immersion objective. Excitation was ensured by supercontinuum white light laser with adjustable excitation wavelength in the range of 440–790nm, pinhole was set to 1AU. Emission depletion was accomplished with 775nm secondary laser to achieve lateral resolution below 30nm. Mitochondria of live A2058 human melanoma cells were stained with Mitotracker Deep Red dye. Fluorescence Correlation Spectroscopy (FCS) enabled by time-correlated single photon counter (TC-SPC) was used to determine diffusion coefficients of nanoparticles labeled with AlexaFluor750 in mouse serum. Fluorescence-Lifetime Imaging Microscopy (FLIM) was used to separate signals from lipophilic dye DiI and Abberior Live Mitochondria Orange dye with overlapping emission spectrums.

Results. By using STED laser we were able to capture and distinguish separate mitochondrial tubular structures in live cells. Diffusion coefficients and the extent of nanoparticles interaction with serum proteins were determined in optically dense environment using FCS. Lack of nonspecific interactions between nanoparticles and proteins was observed. FLIM separated signal from live cells stained with two fluorophores simultaneously, with faster emission from mitochondria being 0.8 ns and slower one – less than 1.0 ns emission coming from membranes and other lipophilic structures.

Conclusions. The super resolution STED microscope with time-correlated photon counter is a versatile tool for a wide range of multidisciplinary projects. It can deliver high accuracy images and data sets for a variety of applications such as biomaterials, histology, protein tracking, and protein-protein interactions, study diffusion in live cells, and much more.

MORPHO-FUNCTIONAL CHARACTERISTICS OF PRIMARY CONGENITAL GLAUCOMA IN LATVIA

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Objectives. The aim of the study was to evaluate morpho-functional characteristics of all patients diagnosed and treated for primary congenital glaucoma (PCG) in the tertiary medical centre from year 2003 till year 2020.

Materials and Methods. The retrospective study was conducted to collect data about symptoms, intraocular pressure (IOP), corneal diameter, axial length (AL) at the time of diagnosis and evaluate long-term outcomes related to the function and structure of optic nerve.

Results. 35 eyes of 27 patients were included in the study. The mean age at the time of diagnosis was 9.5 ± 9.1 months. The mean IOP before the surgery was 26.1 ± 5.6 mmHg. The mean corneal diameter was 13.2 ± 1.0 mm and AL 22.9 ± 1.9 mm. The leading sign reported by caregivers was enlargement of the eyeball (82.9%).

The last follow up was after 106.3 ± 66.0 months. The mean IOP was 15.6 ± 6.4 mmHg. 77.1% of patients were off any glaucoma medications. The reported visual acuity was 0.5 ± 0.3 . Amblyopia was diagnosed in 80% of the eyes. The mean deviation of the visual field was -2.7 dB. The mean value of pachymetry was 503.6 ± 45.3 μ m. The observed excavation of optic nerve head (ONH) was 0.4 ± 0.3 . Optical coherence tomography (OCT) reflected the general circumpapillary retinal nerve fibre layer (cpRNFL) within normal limits for 34.3% and minimum rim width (MRW) for 74.2% of eyes.

Conclusions. The leading sign of PCG in our population was the enlargement of eyeball. At the last follow-up significant reduction of IOP was received to control glaucoma. Amblyopia was one of the main problems affecting long-term visual outcomes. Regular follow-ups are mandatory and new technologies like OCT in paediatric population could help to control these patients even better.

MORPHOLOGICAL CHANGES IN STRABISMUS-AFFECTED EYEBALL MUSCLES IN THE PATIENT AND IN THE CONTROL GROUP

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Objectives. The complex eyeball muscle development leads to a difficult assessment of morphological changes that could disclose strabismus morphopathogenesis. The study aimed to evaluate the distribution and appearance of myosin, dystrophin, collagen IV, PGP 9.5, VEGF, and TGFβ1 in strabismus-affected human eyeball muscles.

Materials and Methods. 25 strabismus patient eyeball muscle specimens obtained during correction surgery and 5 controls obtained during a post-mortem autopsy were examined. Specimens used were the property of the Institute of Anatomy and Anthropology of the Rīga Stradiņš University. Besides histological assessment biotin-avidin immunohistochemistry (IMH) method was used. Results were evaluated semi-quantitatively. Mann-Whitney U-test and Spearman's rank correlation coefficient were calculated. Significance was considered with $p < 0.05$.

Results. In the patient group inflammation, neoangiogenesis, variously sized and newly formed skeletal striated muscle fibres were observed. The patients had diminished amount of myosin, dystrophin, and collagen IV positive structures compared to the controls. Mann-Whitney U-test between the patients and the controls revealed statistically significant differences in myosin ($p = 0.028$), dystrophin ($p = 0.008$), and collagen IV ($p = 0.001$). Spearman's rank coefficient stated two high positive correlations in the patient group between myosin and collagen IV ($p = 0.010$); dystrophin and collagen IV ($p = 0.001$). Numerous to moderate positive structures of TGFβ1 and PGP 9.5, and a moderate number of VEGF-positive structures were found in the patients.

Conclusions. Strabismus-affected eyeball muscles demonstrated degenerative changes. A decrease in myosin and dystrophin indicates muscular dystrophy. Diminished collagen IV-positive structures revealed basal membrane damage. A moderate number of VEGF-positive structures, neoangiogenesis are in favour of ischemia. Due to PGP 9.5-positive structures innervation disorders are excluded. Additionally, TGFβ1-positive structures indicated connective tissue regeneration.

MORPHOLOGICAL CHARACTERISATION OF PAEDIATRIC AND ADULT ACQUIRED CHOLESTEATOMA

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Objectives. The aim of this study was to compare remodelling factors MMP-2, MMP-9, TIMP-2, TIMP-4, proliferation marker Ki-67, inflammation factor NF- κ B, pro- and anti-inflammatory cytokines IL-1 and IL-10, defensins H β D-2, H β D-4, angiogenetic factor VEGF and Sonic hedgehog gene protein in a cholesteatoma's tissue in children and adults.

Materials and Methods. Tissues were obtained from 21 children and 19 adults during cholesteatoma surgery. Tissues were immunohistochemically stained for MMP-2; MMP-9; TIMP-2; TIMP-4; Ki-67; NF- κ B; IL-1; IL-10; H β D-2; H β D-4; VEGF, Shh. The slides were analysed by light microscopy using a semi-quantitative method. Non-parametric statistical analysis – Kruskal-Wallis's test was used to detect statistical differences between groups.

Results. MMP-2 mean values were a few to moderate (+/+), MMP-9 – occasional (0/+), TIMP-2 – a few (+), TIMP-4 – moderate to numerous (+/++) factor positive cells in both groups.

Ki-67 and NF- κ B mean number was occasional (0/+) and few to moderate (+/++) positive cells respectively.

A few to moderate (+/++) IL-1, IL-10 and H β D-2 containing cells, but occasional (0/+) H β D-4 positive cells were observed in both groups.

Mean values of VEGF containing cells were few to moderate (+/++), but Shh positive cells averaged a moderate (++) in children and adults.

There were no statistically significant differences in all cell factors between both groups.

Similar correlations were observed in both study groups between MMP-2 in matrix and perimatrix ($r = 0.626$ adults, $r = 0.918$ children); between MMP-9 in matrix and perimatrix ($r = 0.635$ adults, $r = 0.682$ children) and TIMP-2 in matrix and perimatrix ($r = 0.697$ adults, $r = 0.708$ children).

Conclusions. The increased MMP-2 and TIMP-4 suggest the presence of intensive remodeling in non-age depending cholesteatoma. Almost equal expression of inflammatory factors IL-1 and NF- κ B and anti-inflammatory ones like IL-10, H β D-2 indicate the correct balance between above mentioned processes in cholesteatoma with involvement of moderate tissue ischemia. Finally, detection of Shh proves the persistent gene involvement in cholesteatoma.

MOST USED 3D MODELS FOR HUMAN ANATOMY SELF-STUDIES IN A POST-COVID-19 PERIOD

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Objectives. 3D models can be a valuable addition to existing teaching methods and materials. The present study aimed to detect students' utilization of 3D anatomical models and to determine their preferences for anatomy self-studies in a Post-COVID-19 period.

Materials and Methods. To enable their students to study 3D anatomical models, in the post-COVID-19 period, the Department of Morphology offered registered students self-studies 2–3 times per week (mostly at the weekends), including a limited amount of students in 2–3 streams. This descriptive observational study included results of students from the Faculty of Medicine (1st–2nd year) in 2021–2022. Fixed requests of the students about preferred teaching materials from Google Drive sheets were transferred to a data-capturing form using Microsoft Excel. Mainly descriptive statistics data were calculated, while cross-tabulation or correlations were shown between different demands and groups.

Results. Students in the various semesters used 3D models for different purposes. The majority of the 1st semester students liked to study 3D osteological models, including the skull, bones of the spine, extremities, articulated skeletons and models of muscle attachments. Students liked to see and touch these 3D models in order to learn, remember structures, details or recognize parts. Students from the 2nd and 3rd semesters preferred 3D models of the internal organs, central and peripheral nervous systems, and blood vessels. Many of the students used the 3D anatomical models only before colloquiums and/or exams.

Conclusions. This study underlines the importance of collecting information about students' preferences for self-studies. Results could assist tutors to develop directions to optimize the teaching methods and provide sufficient opportunities for students to use these models for better understanding and learning anatomy. Additional and suitable resources for the study of Human Anatomy could be implemented due to increasing student numbers and difficulty in obtaining some 3D models for teaching purposes.

MULTIDISCIPLINARY APPROACH FOR TREATMENT OF COMPLICATED NECK AND SHOULDER PERIPHERAL FAST FLOW ARTERIOVENOUS MALFORMATION: CASE REPORT

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Objectives. Arteriovenous malformations are abnormal fistulas between arteries and veins without an intervening capillary bed. The peripheral arteriovenous malformations divide into slow, fast and mixed flows. Invasive treatment of arteriovenous malformations may include endovascular embolization, surgical resection, and focal beam radiation, alone or in any combination. In this case report we present fast flow arteriovenous malformation, it has large afferent arteries, which were detected on angiography.

Materials and Methods. A patient presents with a wide 18×13×11.5 cm arteriovenous malformation around the neck, right shoulder, and right armpit. Several endovascular embolizations were performed with vascular trackers (coil). Recurrence was observed. Flow is restored from collateral branches that develop from the thoracic aorta. At the age of sixteen combined therapy was performed (embolization with subsequent extirpation) 48h after embolization. Extirpation was performed and neurolysis for nervus accessorius, nervus cutaneus brachii lateralis and plexus brachialis C5, C6, C7, C8, Th1 are done, and nerves are spared. The main blood vessels are spared. The wound is closed using a flap that consists of skin island and m.trapezius. During the surgery, blood loss was 2.5 l and 800 mL was recovered with a cell saver. Postoperative period in the intensive care unit, hemodynamics was maintained with vasopressors.

Results. Patient postoperative innervation of the right upper limb and motility without abnormal findings.

Conclusions. Congenital arteriovenous malformations can be difficult to treat, because of extensive bleeding, and nerves can be injured during surgery which can lead to loss of function. It is noted that there is a risk of recurrence with incomplete extirpation. Extirpation of the arteriovenous malformations is technically challenging and can be life-threatening therefore embolization can prevent extreme haemorrhage.

OPPORTUNITIES OF RNA-SEQ IN MOLECULAR DIAGNOSIS OF PRIMARY IMMUNODEFICIENCIES

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Objectives. Primary immunodeficiencies (PIDs, also inborn errors of immunity) are a heterogeneous group of more than 400 genetic disorders characterised by a dysregulated immune response, resulting in infection susceptibility, as well as autoimmunity and increased malignancy risk. In most cases, PID is diagnosed late or goes completely undiagnosed. A precise molecular diagnosis would allow the confirmation of a clinical diagnosis and specify the sub-type of PID, enabling the patient to access more suitable treatment options, and family counselling. Currently, the standard molecular approach using exome and genome sequencing is only able to yield a diagnosis in up to 60% of cases, suggesting a need for improvement. RNA-seq has emerged as a complementary assay for rare disease profiling in the past 5 years, providing functional information support for prioritizing uncertain variants in the genome.

Materials and Methods. Bulk RNA-seq was performed on 54 individuals clinically diagnosed with PID (aged 0-69), as well as 5 control samples from individuals without immunodeficiency using KAPA RNA HyperPrep Kit with RiboErase (HMR) Globin (Roche) and paired-end sequencing with Illumina NovaSeq 6000. Expression and splicing outliers and mono-allelic expression were determined using DROP workflow.

Results. Our analyses yielded aberrant expression in 37 out of 59 samples (on average, 3 per sample), splicing outliers in all samples (on average, 21 per sample) and mono-allelic expression in 29 samples (on average, 913 per sample, subsequently prioritized by additional variant filtering).

Conclusions. The observed transcriptome events reveal samples with previously known causal variants thus suggesting the utility of RNA-seq in supplementing exome/genome sequencing in diagnosing PID. Analysis is ongoing for further correlation with clinical and WGS findings.

OSTEOARTHRITIS – THE ENTIRE JOINT DISEASE

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Objectives. Objectives. Pertinent literature suggests that osteoarthritis (OA) emanates from the dysfunction of the whole joint, affecting the articular cartilage, synovium, and subchondral bone, the tissues revealing anatomical and molecular interactions. The study aimed to explore a spectrum of the structural joint damage characteristic of OA employing morphology methods.

Materials and Methods. Material and methods. The entire joint tissues collected from 54 OA subjects (mean age 69 (range 35–85 years)) who underwent joint replacement surgery were processed and used in the study. Toluidine blue, Safranin O/Fast green, and Sirius red staining were used to detect proteoglycans, glycosaminoglycans, and collagen content of the articular cartilage. Synovitis was assessed using CD45, CD14, and CD68 (macrophages), CD45, and CD19 (B lymphocytes), CD45, CD3, CD4 (T lymphocytes), tumor necrosis factor alpha (TNF- α). Synovial fibroblasts were characterized by the expression of CD31, CD34, podoplanin (PDPN), and α -smooth muscle actin (α -SMA). Synovial histopathology was evaluated according to Krenn and Morawietz scores. Statistical data analysis and plotting were performed using Prism 9 and JMP Pro 16 software.

Results. Results. Degradation of cartilage and changes in the proteoglycan and collagen content were confirmed using histochemical markers. Hypertrophic chondrocytes with abundant cytoplasmic inclusions, deep vascular invasions into the cartilage matrix, and reactive chondroclasts were evident. A median synovitis score was 2 (IQR 1–4). The synovial lesions consistent with low-grade synovitis demonstrated an increase in thickness of the lining layer (CD45/CD14/CD68 and CD31/CD34/PDPN positivity) and stromal cellularity (with CD68/ TNF- α positivity), the presence of a few, mostly perivascular CD45+/CD3+/CD4+ lymphocytes.

Conclusions. Conclusions. Loss of articular cartilage structure and function, and its remodeling is one of the major hallmarks of OA. Apart from the cartilage damage, synovial low-grade inflammation over time, or through injury, sustained during the life course has a strong cumulative impact and contributes to progressive OA-associated joint destruction.

OVER-THE-COUNTER DRUG CAUSED METHEMOGLOBINEMIA

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Objectives. A 36-year-old young woman with shortness of breath and dizziness was hospitalized at ED. From the anamnesis it is known that she used the over-the-counter drug *Almagel*® due to stomach pain which contained (1850 mg of benzocaine). Patient was hospitalized with differential diagnosis of PE and acute pancreatitis. At the admission the patient was hemodynamically stable, with slight respiratory failure, SpO₂ – 90%. Clinically, the patient had cyanosis, tachypnea. After careful anamnesis data collection patients arterial blood gases were taken and methemoglobinemia 41.2% was found. Afterwards the treatment with *methylene blue* (*methylthionine chloride* 70 mg intravenously. The level of methemoglobin in the blood dropped to 1.4%. When the symptoms disappeared, the patient is discharged from the hospital in stable condition.

Methemoglobinemia is a life-threatening condition that manifests as functional anemia – reduced ability of hemoglobin to attract oxygen. In case of methemoglobinemia, one or several iron atoms (Fe 2+) in the hemoglobin transformed into oxidized iron (Fe 3+). The oxidized iron ion loses its ability to attract and provide oxygen transport to tissues. In general, there are two types of methemoglobinemia – genetic and acquired. Toxic or acquired methemoglobinemia is more common in clinical practice than genetic. Exposure to chemical agents causes the production of methemoglobin in excess of the body's ability to convert iron in hemoglobin to its physiological state. Classic direct oxidizing agents are benzocaine, prilocaine and other local anesthetics.

Methemoglobinemia is a rare condition in clinical practice. Like in carbon monoxide poisoning, the diagnosis of methemoglobinemia is simple, determined by arterial blood gas analyses. Symptoms of methemoglobinemia are similar to the cardiovascular or respiratory system diseases and can be missed by practitioners. Right diagnosis is facilitated by careful anamnesis data collection, purposefully asking about previous use of medicines, including those that are issued without a prescription.

PATIENT WITH IDIOPATHIC PULMONARY FIBROSIS WITH CONSEQUENT INITIAL FINDINGS OF SJÖGREN'S SYNDROME: CASE REPORT

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Objectives. Keywords: idiopathic pulmonary fibrosis, primary Sjögren's syndrome.

Idiopathic pulmonary fibrosis (IPF) is a type of interstitial lung disease (ILD). It's imperative to diagnose IPF as early as possible. Lung fibrosis is irreversible for there are no pathogenetic treatment yet.

Most common ILD pattern is usual interstitial pneumonia (UIP) and is often associated with autoimmunity, like primary Sjögren's syndrome (pSS). ILD is usually late complication of pSS complication, but in 10% to 51% of cases it can initiate years after the first presentation of ILD.

This case shows the importance of a multidisciplinary approach in early diagnosis for IPF with late onset pSS. A 56y.o. male, after a second pneumonia in that year, visited a general practitioner with complaint of light dyspnea. Inspiratory crackles on auscultation. Chest x-ray showed no infiltrative changes as two months earlier, but peripheral small foci changes. A lung CT visualized hilar and peripheral reticulation. ILD could not be ruled out. The CT was forwarded to Switzerland, Basel University clinic for a second look – consensus for an UIP was reached.

Video assisted thoracoscopy with wedge biopsies histologically fitted ATS/ERS criteria for UIP. DLCO was just below 70%. The multidisciplinary council decided for a treatment for IPF with Pirfenidone. A year later the patient subjectively improved, noting oral and ocular dryness. Elevated anti-SSA and salivary gland ultrasonography suggested diagnosis of pSS,

On follow up DLCO fell to 49% and diffuse progression of fibrosis was found on CT scan. Pirfenidone therapy was continued despite its low efficacy and lack of alternatives. Treatment for Sjögren-associated IPF is empiric as no studies are conclusive of yet.

The role of antifibrotics in such cases remains unclear.

A better understanding of molecular mechanisms involved in the pathogenesis of ILD and pSS should facilitate the development of novel pathogenetic therapies.

PIGMENTED SQUAMOUS CELL CARCINOMA OF FINGERNAIL

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Objectives. We report 79 years old female patient with uncommon manifestation of squamous cell carcinoma. After one year of slowly progressing nail changes – light brown, uniform, vertical pigmentation, minor ulceration and deformation of nail plate medial portion of the fingernail patient was evaluated by dermatologist. Initially patient received clinical diagnosis of onychomycosis and was prescribed topical antifungal medication which was never started. Further patient came for second consult, dermoscopy was performed and nail biopsy was advised. In 2 mm punch nail biopsy pathohistological findings revealed morphologically moderate dysplastic changes of stratified squamous epithelium. Histologically in the obtained material tissue fragments with thick hyperkeratosis and parakeratosis layers, epidermis with papillomatosis, hyperplasia, moderate cellular atypia in all cell layers, rare mitoses in basal layer were seen. Skin biopsy was followed by excision in local anesthesia and second pathohistological investigation concluded grade 1 squamous cell carcinoma pT1NxM0 L- V- R1 (deep line). In serial sections lesion with inverted growth, marked hyperkeratosis, made of atypical pleomorphic epithelioid cells, multiple mitoses, in separate serial sections microinvasive structures with perifocal stroma desmoplasia was found. Lymphovascular invasion was not detected. In deep excision line tumor elements were found. Patient was started on topical 5% imiquimod cream applications five times a week which showed no clinical progress. Currently 5% imiquimod cream has been changed to topical 5% fluorouracil cream applications twice every day and the visible nail changes are showing a regression.

Squamous cell carcinoma of the nail bed is a rare malignant subungual tumor and can be often misdiagnosed. The presence of ulceration indicates the invasive nature of the visible changes and biopsy is essential to timely obtain the correct diagnosis.

POSSIBLE CONTRIBUTION OF SYNOVIAL LOW-GRADE INFLAMMATION TO COGNITIVE IMPAIRMENT IN PATIENTS WITH OSTEOARTHRITIS

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Objectives. To establish a possible association between synovial inflammation, pain, disability, and cognitive impairment confirmed in osteoarthritis (OA) patients using a morphological assessment tool proposed by Krenn and the cognitive screening test MOCA.

Materials and Methods. Patients with late stage hip or knee OA and who do not present with comorbidities (myocardial infarction, diabetes, strokes, severe atherosclerosis, and metastatic cancer in anamnesis) were recruited in the study. Twenty biopsy samples obtained during knee/hip endoprosthesis surgery were fixed in formalin and then paraffin-embedded. Sections were stained with hematoxylin and eosin and assessed using the grading system proposed by Krenn. Cognitive function analysis was performed using Montreal Cognitive Assessment (MoCA). Pain level was analyzed using a visual analog pain scale (VAS). The patient's functional status was analyzed using the VAS and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Data were presented as median values with interquartile range (IQR).

Results. The patients' median age was 65 (36-75) years. The WOMAC value was 49.5 (42;53). The confirmed VAS median value was 7 (3;10), whereas Krenn score median value was defined as 3 (0; 7). Three OA patients presented with mild cognitive impairment (20, 21, and 24, respectively). The confirmed WOMAC in these patients was low to mild (21, 44, and 56), whereas the VAS score for these patients was (4; 7; 7), and the histopathological score was low (3,3,0). Statistically, the correlations between the WOMAC score and MoCA, as well as the Krenn and MoCA score were not established.

Conclusions. The possible associations between synovial low-grade inflammation and cognitive impairment in patients with OA were tested using a small-sized cohort. Statistically significant correlations were not found. Further studies should be applied using a larger number of subjects. Disease phenotypes should be considered.

POTENTIAL ROLE OF PAX7, PAX9, SHH, SOX3, WNT3A AND WNT9B IN OROFACIAL CLEFT-AFFECTED PALATAL TISSUE

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Objectives. Non-syndromic cleft lip with or without a cleft palate is one of the most common congenital anomalies worldwide; however, morphopathogenesis of the clefts is not completely understood yet. Many candidate genes have been proposed to play a causal role, but the majority require further research. Taking into account the importance of PAX7, PAX9, SHH, SOX3, WNT3A and WNT9B in embryogenesis, the aim was to examine the appearance, distribution and potential intercorrelations between the six genes in cleft-affected palatine tissue.

Materials and Methods. The study group consisted of 15 children. The soft tissue samples were taken during veloplasty. Five control tissue samples from the same age group as the patients without any craniofacial pathologies were obtained from the archives at the Institute of Anatomy and Anthropology, Riga. The signals of the candidate genes were visualized using Chromogenic in-situ Hybridization. Nonparametric statistics, Mann-Whitney U and Spearman's tests were used.

Results. A statistically significant difference in the distribution of PAX7, PAX9, WNT3A and WNT9B in the epithelium between the study and control group was observed. The epithelium mostly expressed PAX7; however, PAX9, WNT3A, WNT9B and SOX3 were detected in a less distinct number of cells. The connective tissue cells showed only PAX7. In some cases, SHH was seen in an occasional number of cells. Nineteen statistically important pairs of positive correlations ranging from moderate to very strong were found between the genes.

Conclusions. Changes in the cleft-affected palatal epithelium mainly seem to be regulated by the PAX7 gene with some participation of PAX9, WNT3A, WNT9B and SOX3, while connective tissue changes depend on PAX7 only, but SHH seems to participate individually and indistinctly. Numerous positive correlations represent the gene interactions of the pathways in palatal cleft development.

PREDICTIVE FACTORS FOR REVISION ENDOSCOPIC SINUS SURGERY OF PATIENTS WITH CHRONIC RHINOSINUSITIS WITH NASAL POLYPS IN EAST OF SCOTLAND

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Objectives. Some patients with chronic rhinosinusitis with nasal polyps (CRSwNP) require revision endoscopic sinus surgery (ESS). We aimed to identify commonly assessed phenotypes of CRSwNP that can be used to quantify risk for having further medical polypectomy and/or revision ESS.

Materials and Methods. Retrospective data collection of CRSwNP patients who underwent ESS in the period of 2015 to 2018 in Ninewells Hospital in Dundee, Scotland. Data analysis was performed using IBM SPSS Statistics 27.

Results. 221 patients in total. 74% males, 26% females. Mean age 52.9 years. 40.3% had had previous ESS. 38.9% had asthma, 12.2% aspirin exacerbated respiratory disease (AERD). During mean follow up of 5.3 years, 9% patients had further revision ESS, 21.6% had further medical polypectomy. CRSwNP patients with AERD had higher odds of having further revision ESS (OR = 13.8, 95% CI [3.6, 52.7], $p < 0.001$) compared to CRSwNP-only patients. Patients who had had at least one previous ESS had higher odds of having further revision ESS (OR = 5.8, 95% CI [1.9, 17.9], $p = 0.002$). Patients younger than 55 years had higher odds of having further revision ESS (OR = 8.9, 95% CI [2.0, 39.5], $p = 0.004$) and medical polypectomy (OR = 2.7, 95% CI [1.3, 5.6], $p = 0.007$). Patients with peripheral blood eosinophils ≥ 300 per μL had higher odds of having further medical polypectomy (OR = 3.7, 95% CI [1.4, 9.5], $p = 0.006$).

Conclusions. These results will assist otorhinolaryngologists in identifying higher risk patients who are more likely to experience severe recurrence of nasal polyps requiring further medical polypectomy and/or revision ESS, therefore should be considered for treatment with biologics, such as dupilumab.

PREOPERATIVE RISK ASSESSMENT TOOLS COMPARED TO ACTUAL SURVIVAL FOR INFECTIVE ENDOCARDITIS PATIENTS UNDERGOING CARDIAC SURGERY DEPENDING ON BLOOD CULTURE STATUS

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Objectives. Considering the destructive pattern of infective endocarditis (IE) a surgical intervention is the only life-saving option in many cases. In this study, we aimed to investigate whether preoperative risk evaluation scores such as POTTER, EUROSCORE II and SOFA, can accurately predict the actual survival rate for patients with blood culture negative endocarditis (BCNE) and blood culture positive endocarditis (BCPE) undergoing cardiac surgery.

Materials and Methods. Retrospective single-center study included medical records of 57 patients who underwent cardiac surgery for IE from 2015 to 2019 in Pauls Stradiņš Clinical University Hospital. Patients were divided into two groups - BCNE and BCPE, and evaluated using POTTER and EUROSCORE II scoring systems preoperatively and postoperatively in the last day intensive care unit (ICU) stay. SOFA scoring was used to analyze the mortality among these patients. Data were collected with Microsoft Excel program and descriptive statistical analysis were made with SPSS Statistics.

Results. The study included 39 BCPE and 18 BCNE patients, with an average age of 55 (SD \pm 15). The data showed a statistically significant positive relationship between POTTER score (%) 30 day mortality and EUROSCORE II ($r_s(39) = 0.652$, $p < 0.01$) in the BCPE group. In BCNE a significant relationship between the mentioned variables was not found. In BCPE group comparing POTTER score 30-day mortality there was statistical significance with actual mortality, but, when EUROSCORE II was assessed, it showed no predictive differences between BCNE and BCPE groups

Conclusions. In both BCPE and BCNE groups POTTER (any complication%) score correlates with organ failure in ICU. POTTER, which is used as an emergency surgery (ES) machine learning 30-day mortality predictor score, showed to be a reliable tool, especially for BCPE patients corresponding to an emergency surgery status in cardiac surgery patients.

PRESSURE INJURY INDUCED PNEUMOTHORAX IN WOMAN WITH SCHIZOPHRENIA

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Objectives. Pressure injury (PI) is a significant problem worldwide. PI is defined as lesion, that is caused by unrelieved pressure, that results in damage to the underlying tissue. There are four stages of this kind of lesions and may extend from nonblanchable erythema of skin to deep ulcers, reaching bone. The aim is to demonstrate a rare complication of stage IV pressure injury of the chest, that presented as pneumothorax.

A case study of 56 year old woman with schizophrenia admitted to the surgery ward, due to altered mental status, hyperpyrexia and hypotension (90/60mm/Hg). At the same day she was transferred to intensive care unit because of progressive hypotension, hypoperfusion, suspected septic shock and respiratory failure (RR 33rpm, SP0₂ 89%). On physical examination we revealed that woman had multiple site PI of varying degree (III-IV). The biggest was on the right side of her chest (28x17cm) with necrosis extending to ribs and intercostal muscles. On the next morning respiratory failure progressed (RR 36rpm, SP0₂ 86%) with absent breathing on the right side of the chest. A CT scan showed a great right-side pneumothorax with communication of pleural spaces to external environment and multiple destructive type rib fractures, bilateral pneumonia and multiple abscess formation. Thoracostomy was performed urgently. Pneumothorax almost resolved on the control X-ray and patient's condition became more stable (RR 26rpm SP0₂ 95%). She was very cachectic, hypoproteinemic, anemic (Hb 6.9 g/L) with signs of shock on admission. There was no possible to repair chest wall in surgical way unless optimizing the patient. Despite adequate antibacterial therapy, fluid and nutritional support, physiotherapy and wound care, patient died on the sixth day of her admission due to progressive vital function exhaustion. Conclusion.

PI might be life-threatening conditions and should be evaluated properly especially in patients with complex pathology.

QUALITY OF LIFE OF CHRONIC RHINOSINUSITIS WITH NASAL POLYPS PATIENTS IS DISCONNECTED FROM RADIOLOGICAL AND ENDOSCOPIC NASAL POLYP SCORES IN EAST OF SCOTLAND

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Objectives. Sino-nasal outcome test-22 (SNOT-22) questionnaire, nasal polyp score (NPS) and Lund-Mackay score (LMS) are commonly used to quantify severity of chronic rhinosinusitis with nasal polyps (CRSwNP). We aimed to assess correlation and significance between SNOT-22, NPS and LMS and association between type-2 inflammatory markers in real life clinical practice.

Materials and Methods. Retrospective data of CRSwNP patients from rhinology clinic in National Health Service (NHS) Tayside, Scotland from January 2021 to August 2022. SNOT-22 and NPS were obtained from medical records. Peripheral blood eosinophils (PBE) and total IgE were obtained from available blood test results since having the diagnosis of CRSwNP and up to three years prior the rhinology clinic. CT sinus scans performed within the last year prior the rhinology clinic were included in data analysis.

Results. Total of 114 patients, 61% were males and 39% were females. 65% had asthma (including aspirin exacerbated respiratory disease).

CRSwNP patients with asthma had higher PBE, total IgE and LMS (all $p < 0.05$) compared to CRSwNP patients without asthma.

NPS had strong positive correlation with LMS ($r = 0.553$, $p < 0.001$). NPS was higher in males compared to females (5.3 vs 4.1, $p = 0.005$) but highest PBE were lower in males compared to females (506 vs 668, $p < 0.009$). There were no differences in LMS and average PBE between genders.

Age correlated moderately and negatively with total SNOT-22 score ($r = -0.346$, $p < 0.001$). There was no correlation between SNOT-22 and NPS or LMS.

Conclusions. CRSwNP patients with asthma have a higher disease burden with higher LMS and higher levels of type-2 biomarkers compared to CRSwNP patients without asthma. There are some significant phenotypic differences between genders. Interestingly, older patients underscored their symptoms as age correlated negatively with SNOT-22 score. SNOT-22 shows no correlation with mucosal inflammation severity and NPS. Further evaluation is indicated to assess an abbreviated more focused SNOT questionnaire in CRSwNP patients.

RADIATION DAMAGE TO THE EYE – RATIO OF MORPHOLOGICAL CHANGES AND FUNCTIONAL LOSSES

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Objectives. The results of ophthalmological research after Chornobyl Nuclear Disaster have significantly altered every notion of radiation influence on the eyes. Now, it's possible to highlight two groups of eye diseases related to radiation influence. The first group – the diseases, which are caused only by irradiation, so named, specific radiation injuries. The second group covers eye diseases that often are seen in ordinary circumstances, but might be triggered by the irradiation as a very serious risk factor.

The first group enrolls quite rare disorders – radiation cataract and radiation chorioretinopathy. However, the deepest clinical interest is devoted to the second group eye diseases triggered by the irradiation. Here belong age-related macular degeneration (AMD) and involutional cataract and both of them are irradiation dose-dependent eye disorders.

Additionally, changes in children's refractogenesis and binocular vision disorders detected after Chornobyl Nuclear Disaster have been studied in very sporadic way and show limited number of scientific papers.

The morphological features of radiation exposed of eye have been studied also insufficiently. Results of morphology in retina and choroid in irradiated experimental rats showed the perspective of developing retinal degeneration and atrophy in choroid. The clinical and epidemiological research later proved a significant elevation of AMD incidence. Difficulties in carrying out of the eye morphological studies have limited the data array for histological changes of eye tissues in people exposed to radiation. So, its mandatory to develop micro-morphological research along with the clinical monitoring also, when the experimental works on animals are carried out. Only such kind of research may reveal the wide range pathogenetic mechanisms in development of radiation exposed eye diseases in human.

RARE CASE WITH LUMBAR EWING'S SARCOMA IN YOUNG ADULT: CASE REPORT

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Objectives. Ewing's sarcoma is a rare and aggressive tumour, typically arising from bones or soft tissue around the bones. With an annual incidence of 1-3/ 1,000,000, it peaks in adolescents aged 10-20 years. Associated with caucasian race and male sex. Ewing's family of tumours (EFT) encompasses Ewing sarcoma of bone (ESB), extraosseous Ewing sarcoma (EES), PNET and Askin's tumour.

Patient 20yo male presented acutely with back pain radiating down both legs, especially right. No paresis detected. Dysesthesia in L2 dextra innervation pool. Lumbar CT was carried out beforehand in an outpatient setting.

MRI is performed to clarify the diagnosis. It revealed a pathological mass/tumour in lumbar level with extradural spread in the spinal canal. Compression of the dural sac and spread through the intervertebral foramen outside the spinal canal. Areas of autonecrosis are detected. Working diagnosis Schwannoma.

Patient was hospitalised in planned order for arranged surgery - Lumbotomy dxt, L2 dxt tumour's resection and Hemilaminectomy L1 and L2 dxt, Extirpation of tumour.

Postoperative control MRI reveals fluid in the operation site. Extensive oedema along deep muscles and hemorrhagic fluid along m. psoas. Slight narrowing of the spinal canal, no stenosis here. There is most likely a small amount of foraminal residual tissue in levels Th12-L1 and L2-L3, as well as altered body and dorsal arch on the right side of the L2 vertebra on with sclerotic changes.

Upon discharge from the hospital patient notes numbness under the surgical wound, which decreases dynamically. Neurologically no paresis, tactile and deep sensations are not disturbed. Surgical wounds heal primarily.

Conclusions. Ewing's sarcoma is a malignant, rapidly growing tumour that causes pain and can become debilitating. A multidisciplinary approach and knowledge of the clinical, radiographic features and the management of this entity are important.

RARE COMPLICATION OF CATHETER-ASSOCIATED URINARY TRACT INFECTION – INGUINAL CANAL ABSCESS: DIAGNOSIS AND MANAGEMENT

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Objectives. Inguinal canal abscesses not related to previous inguinal canal invasive manipulation are very rare. Their site of origin and routes of spread are rarely immediately identifiable. It is most common and difficult to differentiate from small bowel incarceration.

A 66-year-old man was admitted to the emergency clinic in a generally serious condition with febrile temperature, severe pain in the right groin area. Patient has benign prostatic hyperplasia and has a urinary catheter for 6 months. Right-sided orchepididymitis present for 2 months. Treatment with slight improvement, but worsening for 2 days. The patient has several comorbidities: diabetes, left leg stump after amputation, coronary heart disease.

Elevated inflammatory markers and renal failure (GFR 24.82mL/min) were found. Urgently ultrasound (US) of the right inguinal and scrotal regions and computed tomography (CT) of the abdominal organs were performed. The US showed hydrocele and right inguinal hernia incarceration was suspected. The CT scan, non-contrast performed, showed a precise diagnosis of funiculitis and abscess extension to the retroperitoneal space till the seminal vesicle. Hypoechogenic changes in the prostate were clarified by transrectal ultrasound (TRUS). Two puncture aspirations were performed to cure a prostate abscess. Inguinal canal surgery was performed: drainage of the abscess, orchofuniculectomy, cystostomy. The patient received Meropenem for 11 days and Ciprofloxacin for 10 days.

The bacteriological result of the prostate abscess and inguinal canal was the same: *Klebsiella pneumonia*, sensitive to Ciprofloxacin. Pathology revealed purulent orchepididymitis with abscesses, seminal cord with inflammation and granulation tissue. The wound healed. The patient had a follow-up visit after 3 months and had no complaints.

In cases where a urinary tract infection is treated but does not fully benefit from treatment, further investigation is needed. Successful treatment of the primary site of infection and surgical exploration of the inguinal canal gave good result.

RARE HYPERTROPHIC GASTROPATHY – MENETRIER DISEASE: CASE REPORT

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Objectives. Menetrier disease is a rare hypertrophic gastropathy characterized by hypertrophied mucosal folds in the gastric fundus and corpus as well as protein loss leading to hypoalbuminemia. This pathology is associated with an increased risk of gastric cancer.

The case report presents a 46 years old man who has complaints of epigastric pain for seven years. Different diagnoses, such as hiatal hernia, gastroesophageal reflux disease, biliary reflux, *Helicobacter pylori* infection were established. Since January 2022 abdominal pain has become worse. Over the past few months the man has lost about 37 kg. In April 2022 the patient was admitted to Ogre Regional Hospital where after performing abdominal computed tomography signs of Menetrier disease were seen. Upper endoscopy was carried out which showed hypertrophied gastric folds with a suspicion of infiltrative tumor however specific histopathological findings were not found. In May 2022 the patient was hospitalized to Pauls Stradins Clinical University Hospital. Gastrosocopy was repeated and enlarged mucosal folds were observed in the gastric cardia, fundus and corpus. Histopathological evaluation revealed features of Menetrier disease. The levels of total protein and albumin were slightly decreased (total protein – 46 g/L, albumin – 31 g/L). The patient was discharged from the hospital with recommendations to perform other investigations for more accurate diagnosis. Endoscopic ultrasound was carried out with obtaining of material for cytological examination that did not show malignant cells. Also, in June 2022 the patient underwent a laparoscopic wedge resection of the stomach for histopathological examination that confirmed the diagnosis of Menetrier disease. Taking into account the probability of the development of gastric cancer, total gastrectomy is indicated.

In conclusion, despite the fact that Menetrier disease is a very rare pathology this diagnosis should be kept in mind due to an increased risk of oncology.

RAYNAUD'S PHENOMENON IN PENIS

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Objectives. Introduction. Raynaud's phenomenon of the penis is an extremely rare condition that is characterized by vasospasms in the affected body part resulting in sudden onset of cold sensation, numbness, pain and cold-induced skin color changes. Usually it affects fingertips, toes, nipples and ears, but penile symptoms are rarely reported. Diagnosis of Raynaud's phenomenon is usually clinical, based on thorough patient history and physical examination. Raynaud phenomenon can be primary (idiopathic with no underlying conditions) or secondary (associated with a disease that may underlie the episodes). Secondary Raynaud's can be a manifestation of various autoimmune rheumatic diseases.

Case report. A 51-year-old man presented in an urology outpatient clinic suffering from pain and cold sensation in his penis during cool weather for the past 15 years. Although less bothering, other symptoms included pale fingertips and toes with numbness sensation. He did not have sexual complaints or erectile dysfunction. The patient has a history of headaches due to high blood pressure, dyslipidemia, osteoarthritis, steatohepatitis and atherosclerosis. Patient underwent a serologic investigation which revealed cryoglobulinemia. He was referred to a rheumatologist who confirmed the diagnosis of secondary Raynaud's syndrome resulting from cryoglobulinemia. He was prescribed nifedipine, which did not provide significant relief of the symptoms in fingers, toes and did not improve penile pain. Afterwards he was prescribed with 50 mg of sildenafil which provided him with a complete relief of penile symptoms, therefore he was recommended further therapy of tadalafil.

Conclusions. There is a high uncertainty when it comes to treating penile Raynaud's syndrome because of the rareness of this syndrome. Based on some studies and cases reported, phosphodiesterase-5 inhibitors, specifically tadalafil due to its prolonged pharmacological effect, may be an optimal choice of relieving penile Raynaud's disease symptoms. More significantly, the approach to each patient should be individualized.

RECENT ACQUISITION OF UNIQUE ANATOMICAL OBJECTS AT RSU ANATOMY MUSEUM

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Objectives. Countless anatomical museums emerged in Europe from the 18th century onwards, only to subsequently disappear. Some were dismantled, rearranged, some were deliberately destroyed, some were lost due to poor storage, lack of funding and a scarcity of qualified curators. Luckily, in some cases, anatomical collections survived thanks to private initiatives of individuals who saw in them unique and rich medical and cultural heritage.

One example of such survival is the private collection of Arthur von Hochstetter (1918–1997), a professor of anatomy at the Department of Clinical Anatomy at Kantonsspital Basel. His anatomical collection consists of several thousand once abandoned anatomical specimens that he rescued and they date from the early 18th century to the 1970's. Up until the present day, the collection has been housed under the auspices of Hoffmann– La Roche in Basel, Switzerland and curated by Hochstetters' successor, Oscar Baldomero.

In 2022, Oscar Baldomero donated 35 selected objects from this collection for display in the RSU Anatomy museum. Donated specimens represent the anatomical techniques used for body preservation and anatomical representation from the 18th century to the early 20th century. Some specimens can undoubtedly shock, but this was never their intended purpose. As stated by Oscar Baldomero (Tales from the Anatomy theatre, 2011), these specimens should always be viewed in light of the historical context in which they were collected and prepared. This paper deals with the collection from the perspective of museology, considering the narratives and ethics of such display within a public museum.

RECURRENT INTERMITTENT BROWN SYNDROME: CASE REPORT

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Objectives. Brown syndrome is uncommon vertical strabismus syndrome characterized by limited elevation of the eye in adducted position. It most often occurs as congenital and constant condition, but it can also be acquired and intermittent.

A 10 years old boy complained about pain in right eye, diplopia, running nose, dizziness and fever. The patient has had running nose for 3 weeks. Patient displayed a chin-up head posture to reduce diplopia. Ocular examination revealed right eye hypodeviation, reduced adduction, and movement to the up with the right eye. In primary position near fixation prism cover test revealed 7Δ base-in and 18 Δ base-down, prism was placed in front of the left eye. There were no abnormalities in pupillary, anterior, and posterior segment examination. Magnetic resonance imaging with contrast showed minimal mucosal edema in sphenoidal sinus, there were no abnormalities in brain, or cranial nerve. Patient received nonsteroidal anti-inflammatory drugs to reduce pain and inflammation, locally xylometazoline hydrochloride was used to reduce nasal congestion. Following one month diplopia had decreased, near prism cover test showed 6Δ base-in and 4 Δ base-up, prism was placed in front of the deviated eye. From the anamnesis we know that 3 years ago there were 2 similar episodes in left side with spontaneous resolution within several weeks. In the first episode laboratory tests were unremarkable and neurological examination unrevealed any abnormalities.

A multidisciplinary assessment of patients with acute strabismus is crucial to exclude diseases which demand fast and appropriate treatment. Observation and conservative therapy is the mainstay for most forms of Brown syndrome.

REGULATORY DOCUMENTS (STATUTES) OF THE LATVIAN RED CROSS, 1918–1940

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Objectives. To describe and evaluate the activity of the Latvian Red Cross through the regulatory documents, taking as an example the statutes of the Red Cross Society or the law from 1918 to 1940, compared to the statutes of the Latvian SSR Red Cross Society and the Latvian Red Cross Society in 1946 and 1991.

Materials and Methods. Was used materials from the collection and library of the Pauls Stradiņš Medicine History Museum and regulatory documents issued by the Latvian Red Cross. Was used the research historical comparative and descriptive method

Results. The Latvian Red Cross was founded on November 20, 1918 in Riga. Its first statutes were prepared already on December 29, 1918, but approved on July 23, 1919. They were approved in a revised form in 1927. In 1938, was adopted the Law on the Latvian Red Cross. In 1940, after the lost of Latvia independence, the Latvian Red Cross was reorganized by creating the Red Cross Society of the Latvian SSR, which was part of the Union of Red Cross and Red Crescent Societies of the USSR. Its statutes were approved on November 28, 1946. On April 26, 1991, was made on the restoration of the Latvian Red Cross and the approval of the new statutes.

Conclusions. During its activity, the Latvian Red Cross changed or supplemented its regulatory documents several times, which was related to changes in its functions or activities. Comparing the statutes of 1919 and 1938, it can be seen that from the activity of the Latvian Red Cross during the Latvian War of Independence, it moves to the provision of services in peacetime. By comparing the association's statutes after the Second World War, one can very well understand the diversity and importance of the services provided by it in protecting the health of the population until 1940.

RĪGA STRADIŅŠ UNIVERSITY ANATOMY MUSEUM ANTHROPOLOGICAL SURVEY DIGITISATION PROJECT

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Objectives. RSU Anatomy Museum stores a collection of anthropological expedition materials of the 1920s–1930s. The collection includes anthropological surveys, photographic materials and anthropometric instruments. The aim is to research and preserve this collection.

Materials and Methods. Descriptive method.

Results. In 2021, a digitization project was started in cooperation with healthcare solution company “Roche Latvia” and Statistics Unit at Rīga Stradiņš University. As a result of this project 11 313 surveys were digitized, from expeditions that took place in the 1930s, in Vidzeme, Kurzeme and Zemgale regions.

The selected storage place for the digitized data was the e-resources repository – the RSU Dspace platform, which is a safe and convenient enough place to store these data, as well as to enable access to these resources for research purposes.

Considering that the information displayed in the surveys contains sensitive personal data, restricted access has been imposed to view them. You must contact the collection manager to open and view the surveys.

Conclusions. Digitization is a good way to preserve materials, as well as to find and collect information faster and more efficiently. It is good research material to see what the average Latvian person looked like.

During the research process it was found that the museum storage holds most, but not all materials of the anthropological expeditions.

RIGHT ATRIAL MORPHOLOGY IN CORONARY HEART DISEASE AND DEGENERATIVE AORTIC VALVE STENOSIS

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Objectives. Coronary heart disease (CHD) and degenerative aortic valve (AoV) stenosis have common risk factors. However, these conditions are not always observed at the same time. This confirms the existence of risk and pathogenesis factors specific to each disease.

Aim of the study: to determine the distribution of markers of apoptosis, homeostasis regulating factors, innervation, ischemia and inflammation in right atrial tissue in cases of CHD and degenerative AoV stenosis.

Materials and Methods. During elective cardiac surgery, right atrial tissue fragments were obtained from 24 patients with CHD and 12 patients with degenerative AoV stenosis. The control group – right atrial tissue fragments from 5 patients operated for congenital heart disease. Tissues were stained with hematoxylin and eosin for routine light microscopy, treated with the biotin-streptavidine method for immunohistochemical detection of tissue markers (atrial natriuretic peptide (ANUP), PGP 9.5-containing innervation, vascular endothelial growth factor (VEGF), chromogranin A (ChgA), endothelin 1 (ET-1), interleukin 1 α (IL-1 α), interleukin 10 (IL-10), β defensins 2, 3 and 4 (β D2, β D3 and β D4, respectively)) and by the TUNEL method for the detection of apoptotic cells. For the quantification of structures, a semi-quantitative counting method was used.

Results. Right atrial tissue in both CHD and degenerative AoV stenosis is characterized by non-specific degenerative morphological changes and a high proportion of apoptotic cardiomyocytes. Connective tissue ingrowth and vascular sclerosis were observed in some patients in both groups.

Patients with CHD and AoV stenosis had significantly more ANUP, IL-10, β D2 and β D3-positive cells, but fewer ChgA-positive cells than controls.

The rich expression of antimicrobial peptides was observed in all study groups.

Conclusions. In both groups of acquired heart disease, an anti-inflammatory and antimicrobial response prevails in the right atrial tissue, but increased activity of the neuroendocrine system is more common in patients with congenital heart disease.

RISK FACTORS FOR RECURRENCE OF RENAL CELL CARCINOMA AFTER PARTIAL OR TOTAL NEPHRECTOMY

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Objectives. Background. Renal cell carcinoma (RCC) is the 10th most common cancer worldwide and accounts for 2% global cancer diagnoses. Although overall 5 year survival rate is high – 76%, treatment of RCC recurrence is challenging. After primary treatment RCC recurrence rate can reach 2–30%.

Materials and Methods. Aim. The aim of the study was to evaluate RCC recurrence rate after operative treatment and to distinguish recurrence risk factors.

Methods. In the retrospective study overall, 251 patients were included, average age was 65, median 66, approximate 3:2 male to female ratio. RCC patients were enrolled who underwent surgical treatment in Pauls Stradiņš Clinical University Hospital from April 2018 to April 2022. Data were gathered about the tumour stage, grade and histological type (clear cell (ccRCC), papillary (pRCC) and chromophobe (chRCC) carcinoma). Follow up radiologic examinations were interpreted to evaluate renal cancer recurrence status.

Results. RCC recurrence was observed in 4% (N = 10). Recurrence rate for ccRCC, pRCC and chRCC was 4.0% (N = 7), 5.3% (N = 3), 0% (N = 0) respectively. A statistically significant difference between recurrence rate and higher T stage was detected. The results indicate that advanced T stage ($\chi^2 = 49.405$; $p < 0.001$) has a relation to recurrence. No significant difference was found between histological types, although disease free survival was more favourable for pRCC (16.3 months) compared to ccRCC (9.4 months).

Conclusions. Conclusions. The RCC recurrence rate in our study was 4% which is consistent with literature data. The results showed that higher T stage influences the recurrence rate. Timing of recurrence of ccRCC after radical operative treatment tends to be shorter than pRCC.

RSU HISTORY: PROFESSOR GEORGS ANDREJEVS (1932–2022)

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Objectives. Professor, *habil. med.* Georgs Andrejevs (1932–2022) is the founder of Latvian anesthesiology and resuscitation. G. Andrejevs was a physician, scientist-inventor, and teaching staff in Riga Medical Institute (RMI). He is the author of more than 200 scientific publications and 10 inventions. On 4 May 1990, Georgs Andrejevs voted for the independence of Latvia and promoted its name worldwide as a politician and Foreign Minister, ambassador, and diplomat.

Materials and Methods. Comparative historical research

Results. The professor devoted 30 years of work to the Department of Anesthesiology and Reanimation of the Riga Clinical Hospital, from being a physician, RMI assistant professor, professor, and head of the chair to a full member of the Latvian Academy of Sciences.

During his studies, G. Andrejevs developed the first scientific work in microbiology, which he presented in 1956 at the State Medical Institute of Minsk (Belarus) at the student scientific conference. In 1962, G. Andrejevs was approved as the chief anesthesiologist of the Ministry of Healthcare of the Latvian SSR. The professor was one of the first medical researchers in the Latvian SSR who went on scientific missions with his inventions outside the USSR. The most important practical innovations were an ambulance based on the “RAF-2203” minibus and a special anesthesiology mask.

Conclusions. Special mention should be made of his research achievements through international scientific cooperation. It contributed to the elevation of anesthesiology and reanimatology in Latvia to a high level. Under his leadership, anesthesiology and reanimatology in Latvia became a separate branch of medicine, but his inventions in anesthesiology are still in use today.

SELECTION OF BASIC ANATOMICAL STRUCTURES FOR STUDENTS' PRACTICAL SKILLS AND CLINICAL FUTURE: CHALLENGES AND DIRECTIONS

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Objectives. The objective of the present study was to detect the complex basic anatomical structures that can be important components for the practical skills of students at the end of the Human Anatomy course respecting the transition of students from this basic study course to clinical courses.

This descriptive case report study took place in autumn 2022 at the Department of Morphology. Until autumn 2019, a total of 1087 structures were asked the students to learn for testing of the practical skills during three semesters in the Human Anatomy course. All structures were presented in 4 categories: locomotor (496 structures) and internal organs (266 structures) systems, nervous (206 structures), and cardiovascular system (119 structures). In autumn 2022 for testing of students' practical skills, anatomy tutors reviewed these structures in a compressed time frame and detected basic 150 structures, related to clinical courses and/or clinical procedures. No statistical calculations were performed there.

At first, the plastic 3D models with visible basic anatomical structures from the Laboratory of Anatomy were selected by tutors for the needs of the 3rd-semester students. Based on the topics of Human Anatomy course content for the Faculty of Medicine, there were prepared 150 anatomical structures for recognizing on 3D models and virtual dissection table "Anatomage". Respecting inclusion, exclusion criteria and/or difficulties, the content was reduced and there were selected only basic anatomical structures of locomotor (30 bony, 20 muscular), internal organs (30), nervous (40), and cardiovascular (30) systems. Specific clinical conditions were identified for each anatomical system.

By reviewing previous structures, a new complex of basic anatomical structures was designed and implemented, expecting positive educational outcomes. Selected anatomical structures with practical integration of clinical contexts should be included at the end of the Human Anatomy course to enhance students' understanding and role in the future.

SINONASAL OLFACTORY NEUROBLASTOMA: RARE CASE REPORT

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Objectives. A 69-year-old female had complained about her right-side nasal congestion. A CT scan of nasal sinuses revealed a polypoid mass of 30×18×50 mm in the right nasal sinus taking up all nasal conchas with nasal septum deviation. Biopsy of the mass was performed.

Histologically, the lesion showed lobular structures, which were made of moderately pleomorphic hyperchromatic cells with round nuclei and minimal amount of cytoplasm. Nucleoli were absent. There were 12 mitoses per 10 high-power fields. The tumor background had eosinophilic edematous stroma with lymphocytic infiltration. The proliferation of small blood vessels in some areas was apparent, together with some regions of necrosis. “Small round blue cell” tumor’s morphology and its typical localization suggested neuroendocrine tumors, NUT carcinoma, lymphoma, paraganglioma, and melanoma. Immunohistochemically, the tumor was chromogranin, synaptophysin, CD56 positive. SMA, CD34, CKAE1/AE3, p40, CK7, HMB45, CD99 were negative. Ki67 proliferation index was 90%. S100 showed strong positivity at the periphery of lobules in a specific sustentacular cell pattern.

Neuroendocrine markers positivity and S100 stain suspected olfactory neuroblastoma.

Surgical intervention was indicated. In gross examination, the lesion was fragmented, with a polypoid greyish-pink region. Microscopically, the tumor morphology and immunostaining were identical as in the biopsy specimen. In addition, the tumor had the classical Homer Wright pseudorosettes and Flexner-Wintersteiner rosettes. These specific findings confirmed the diagnosis of olfactory neuroblastoma.

Alterations in BLM, EGFR, ATR, CHEK2, FANCD2, TGFBR2, BCR genes were detected.

Because of the rarity of olfactory neuroblastoma, pathologists might have problems diagnosing cases correctly. Olfactory neuroblastoma can mimic a lot of tumors within the sinonasal tract. It is important to recognize these neoplasms because olfactory neuroblastoma requires a specific bicranial-facial surgical approach, which is different from other sinonasal tract malignancies. Correct diagnosis can significantly affect prognosis and patient survival.

SPECTRUM OF RADIOLOGICAL CHANGES IN THE LUNGS OF PAEDIATRIC POPULATION WITH COVID-19 INFECTION

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Objectives. To clarify the spectrum of radiological changes in the lungs of children with COVID-19 infection who received treatment in the hospital.

Materials and Methods. We performed a retrospective analysis at the Children's Clinical University Hospital, Riga, Latvia. From the electronic database, was selected patient histories with COVID-19, who underwent chest X-ray during the in-patient. The degrees of lung damage were divided into 4 categories: 1 – “bronchial drainage disorders” and/or “bronchial obstruction”; 2 – mild degrees (the damage occupied < 1/3 of the lung volume); medium grade (lung damage around 1/3–2/3 of the lung volume); severe or diffuse lung damage (> 2/3 of the lung volume). The following data were analysed: gender, age, description of lung X-ray, duration of treatment, symptoms, CRO and IL-6 blood levels, total number of leukocytes and other. Statistical data processing was performed with SPSS.

Results. The study included 99 children: age group 1 from birth to the 1st month n = 11 (11.1%), group 2 from the 1st month to the 1st year n = 20 (20.2%), group 3 from the 1st–5th year n = 38 (38.4%), group 4 from the 5th–12th year n = 13 (13.1%), group 5 from the 12th–18th n = 17 (17.2%). Chest X-ray without pathological changes was observed: in group 1 n = 6, in group 2 n = 7, in group 3 n = 10, in group 4 n = 6, in group 5 n = 7; in total n = 36 (35.6% of all). First category: n = 32, and 19 of them were in age group 3. Mild grades: n = 19. Intermediate grades: n = 8. Except for the group 1, severe lung damage was found in one patient in each group.

Conclusions. The largest number of infected was observed at the age of 1–5 years. In all age groups, as the severity of lung damage increased, the number of patients decreased. Further observations are needed to draw more definitive conclusions.

TISSUE PHENOMENA AND THEIR POSSIBLE EXPLANATION

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Objectives. Phenomena means something (such as an interesting fact or event) that can be observed and studied and that typically is unusual or difficult to understand or explain fully. We aimed to detect four tissue phenomena like an unusual epithelial processes, tissue factors patterning, cellular shape/phenotype changes, and tissue replacement capacity.

Materials and Methods. The material of oral cavity, heart, serosal membranes, vocal cords was obtained from around 700 patients of different age with different diagnosis during 2021–2022. Genes/gene proteins, growth factors/their receptors, remodeling factors, and proliferation markers were researched immunohistochemically.

Results. Unusual network-like processes of the germinative layer were detected in oral stratified squamous epithelium richly presenting HoxB3, NGFR, FGFR1, while NGF, bFGF, Msx were expressed indistinctly here, but Ki-67 was absent at all. This was seen in 40 patients (out of 400) with cleft lip palate. Ki-67 showed strict epithelial appearance from zero to abundant in patients with singer nodules, cleft, lung diseases. Epithelium and connective tissue demonstrated MMPs/TIMPs appearance with solitarily increased one/or the other, and equal expression of both factors in cleft and adhesions. Mesothelium, epicardium and fibroblasts demonstrated changed cellular shape from flattened to round one along with the rich expression of different factors in adhesions and heart diseases. Angle II/III skeletal dysplasia patients demonstrated empty from BarX1 bone, while oral epithelium richly expressed this gene.

Conclusions. The presence of tissue phenomena does not depend on age. Stratified squamous epithelium network-like processes show stimulated growth properties (HoxB3, NGFR, FGFR1) and probably are the result of prolonged inflammation. The common phenomenon is tissue proliferation and remodeling factors patterning with three variations in their distribution coexisting to tissue functionality. Changes in cellular shape mainly suggests the possible phenotype changes of cells. Tissue replacement phenomenon means the expression of factors in one tissue type typically being expressed by the other type.

TRAINING OF MILITARY MEDICS AT RĪGA MEDICAL INSTITUTE FOR THE NEEDS OF THE SOVIET ARMY 1950–1990

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Objectives. Materials in the collection of the Rīga Stradiņš University (RSU) Museum have few evidences of the Military Department that once existed. Therefore, in 2021–2022, museum employees interviewed graduates and collected materials of the former Rīga Medical Institute (RMI; the name of RSU from 1950 to 1990).

Materials and Methods. This paper employs methods of historical research and comparison.

Results. Military training or preparation for military medicine was mandatory for all RMI students. This training was organised by the Military Department, which operated at the higher education institution from 1950 to 1992, when it ceased to exist. The focus of the curriculum was on moral political upbringing, professional preparedness and psychological resilience in combat situations. The basic cycle included general military training, medical service organisation and tactics in combat conditions, military toxicology and protection from weapons of mass destruction, as well as civil defence medical service organisation. Male students, whose health condition was adequate, were required to participate in practical military training at an army training ground. The males, who graduated the RMI Faculty of Medical Treatment were awarded the rank of a lieutenant in the Soviet Army (SA) and became reservist officers for the SA medical service. Consequently, they automatically acquired a second speciality, the army doctor. They were exempt from the compulsory military service in the SA, where all men in the USSR had to serve for at least two years.

To provide the SA with a medical service, RMI admitted more men than women to the Faculty of Medical Treatment, and they often had lower results on admission exams.

Conclusions. The collected evidences and the newly obtained materials and their research have reconfirmed that the main feature of the higher medical education system in the Soviet Union was its militarisation.

TWO CASES OF CORTICAL BLINDNESS AND OPTIC NERVE PATHOLOGY IN PAEDIATRIC PATIENTS CAUSED BY RARE MUTATIONS IN SCN8A AND N2RF1 GENES

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Objectives. Our goal is to present two pediatric patient cases with cortical blindness and optic nerve pathology due to rare cause of mutations in SCN8A and N2RF1 genes. Both patients were consulted and treated in Children's Clinical University Hospital of Latvia ophthalmology, neurology and genetics departments, for visual impairment and neurocognitive developmental delay.

Female patient, currently 25 years old, with heterozygote mutation in gene N2RF1 c.328_330del, p.(Phe110del) is fully diagnosed with Bosch-Boonstra-Schaaf Optic Atrophy Syndrome (ORPHA: 401777, OMIM: 615722) in year 2022, first presented at 4 months of age in 1997 with severe neuromotor and cognitive deficit (epilepsy, autism, hyperactivity, oromotor dysfunction, corpus callosum hypotrophy), as well as non-progressive optic atrophy and cortical blindness. MRI-optic nerve atrophy, corpus callosum hypotrophy, visual acuity Cardiff 20/230, nystagmus. Fundus-optic nerve atrophy. With an estimated prevalence between 1 in 100 000 to 250 000 people worldwide, BBSOAS has been so far diagnosed in about 100 patients.

N2RF1 gene is in DNS's highly conserved region, that is responsible for transcription, involved in neurogenesis, neural differentiation, eye and optic nerve development and cortical patterning, thalamocortical pattern axon guidance, arborisation and hippocampal volume and function organization

Male patient, currently 3 years old, with heterozygote frameshift mutation in gene SCN8A c.197_1990del, p.(His658Cysfs*19) diagnosed with Autosomal dominant cognitive impairment with or without cerebellar ataxia (OMIM: 614306), presented at the age of 1 year 6 months with optic nerve hypoplasia, strabismus, cortical visual impairment, neurocognitive developmental delay (speech impairment) and ataxia. MRI-optic nerve hypoplasia/atrophy. Visual acuity Cardiff 20/80, strabismus, fundus-optic nerve hypoplasia.

SCN8A gene is responsible for initial membrane depolarization that occurs during generation of action potentials in most electrically excitable cells

Both patients firstly presented with severe neurological deficit that overshadowed strong ophtalmic genetic component presence.

UNIQUE ANTHROPOLOGY DATA ON LATVIANS IN THE 1930S – RESULTS OF PRIMANIS' EXPEDITIONS

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Objectives. We aim to analyse newly digitized data collected in 1930s on Latvian citizen characteristics. This is the attempt to describe anthropological characteristics from a unique study that widely describes the parameters of people living in different regions of Latvia.

Materials and Methods. The activity of Latvian Professor Jekabs Primanis contributed to the development of anthropology as a branch of science. Under his leadership, expeditions were organized in Piebalga (1936), Jūrmala of Vidzeme (1937) and Zemgale district (1939). In the expeditions a descriptive or social part with demographic, genealogical, medical, and social questions, and measurements were included. A total of 9,425 people questionnaires were digitalised and anthropologically studied.

Qualitative data were described as counts and percents. Quantitative data were described as median, range and interquartile range. Data were organised in MS Excel and analysed with statistical program IBM SPSS Statistics 27.0.

Results. A total of 4,316 (45.8%) males and 5,109 (54.2%) females were included in the study. Almost half of participants 4,453 (47.2%) were not married and another half 4,074 (43.2%) were married, only 842 (8.9%) were widowed and 56 (0.6%) were divorced. The median age from 8,870 of total questionnaires of participants was 36 years with range between 1 year to 96-year-old. Anthropometry descriptions such as face form, forehead, cheekbones, mouth, chin form, build of body, skin colour, hair shape and others were included. In the 1930s, the average Latvian most likely was with oval face (38.6%), moderately strongly curved cheekbone (69.7%), moderately large/medium mouth (79.6%), average chin (78.1%), light skin colour (98.3%) and with smooth hair shape (93.3%).

Conclusions. Such a study is unique to Latvia, and it would be desirable to continue in order to provide an approach to international studies on genealogy.

VISUAL ACUITY CORRELATION WITH OTS 2 YEARS BEFORE COVID-19 PANDEMIC AND DURING THE PANDEMIC IN PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL

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Objectives. Ocular trauma score(OTS) provide a simple system with few variables to predict final visual outcome of an injured eye. The purpose of this study was to correlate OTS as a prognostic tool with the final visual acuity(VA) after eye trauma two years before COVID-19 pandemic and during the pandemic in Pauls Stradins university hospital.

Materials and Methods. In this retrospective, hospital-based, comparative analysis, patients presenting to the emergency department with ocular trauma in the following COVID-19 period (March 12 2020 to January 6, 2022) were compared with patients in the pre-COVID-19 period (March 12, 2018 to January 12, 2020).

Results. Overall, 89 patients (COVID-19 period: 37 and pre-COVID-19 period: 52) presented with ocular trauma. The mean age of the patients in COVID-19 and pre-COVID-19 periods were 44 [IQR 26] and 39 [IQR 29] years.

The most common ocular diagnosis was contusion of bulbi oculi (18.9%) in COVID-19 period and corneal/scleral perforation (23.1%) in pre-COVID-19 period. Surgical intervention was required in 59.6% of patients in pre-COVID-19 period and in 48.6% of patients in the COVID-19 period. Median VA shortly after trauma was light perception in both groups. In prepandemic group most frequent final VA after treatment was VA light perception/hand motion (31%) but in pandemic group final VA was > 0.1 (54%). In prepandemic group median Raw score sum was 37 points [IQR 24], but OTS score was 1 [IQR 1]. In pandemic group median Raw score sum was 46 points [IQR 39], but OTS score was 2 [IQR 2]. There was statistically significant difference in Raw score sum between both groups ($p < 0.05$; Mann Whitney U test – $p = 0.014$). There was also statistically significant difference between OTS and final VA in both groups (One-Sample Chi-Square Test; $p < 0.05$).

Conclusions. OTS is a good tool which helps to prognose potential visual acuity after ocular trauma. Also in our study final VA was higher than expected. This difference could be linked to less severe ocular trauma cases due to pandemic restrictions.

CRYSTALLIZATION OF CLINICALLY USED LOCAL ANESTHETIC MIXTURES

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Keywords. Local anesthesia; Postoperative analgesia; Pharmacology

Objectives. Amino-amide local anesthetics can precipitate in the tissues and carry the risk of perineural crystal deposition. The aim of the study was to evaluate if crystallization occurs in routinely used mixtures of local anesthetics and the factors that can influence it.

Materials and Methods. 1 mL specimens of local anesthetic mixtures were collected from syringes prepared for post-operative use in peripheral nerve catheters by anesthesia nurses. All specimens were visually investigated under microscopic view. The grade of crystallization was assessed using a 6-point grading system. Time since preparation, pH, and temperature were recorded and correlated with crystallization grade.

Results. Collected specimens contained 0.75% Ropivacaine and 0.5% bupivacaine mixed in a 1:1 solution with sodium chloride 0.9% and with or without fentanyl. All mixtures showed crystallization grades ranging from 1 to 5 (median 3(2,4); 3(2,3), $p = 0.76$). The grade of crystallization was not related to the addition of fentanyl, pH ($r = -0.14$, $p = .46$) and time since preparation ($r = 0.21$, $p = 0.40$) but it was related to temperature ($r = 0.37$, $p = 0.047$).

Conclusions. Crystallization is present in routinely used mixtures of local anesthetics and is influenced by temperature. This finding can have implications for the storage of pre-prepared local anesthetic mixtures in clinical practice.

EFFICACY OF ACUTE PAIN TREATMENT AFTER SHOULDER JOINT REPLACEMENT MEASURING ANALGESIA NOCICEPTION INDEX (ANI) USING N. SUPRASCAPULARIS STIMULATING CATHETER OR LOCAL ANESTHETIC INJECTIONS

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Keywords. ANI; Acute pain; Stimulating catheter; Rupivacaine

Objectives. Patients after shoulder joint replacement surgery report moderate to severe pain even if postoperative pain is treated multimodally, so novel treatment modalities are important. Aim of the study was to use N. Suprascapularis stimulating catheter compared to local anesthetic injection after shoulder arthroplasty.

Materials and Methods. The prospective randomized pilot study was carried out at the Hospital of Traumatology and Orthopaedics Riga, Latvia, from May to December 2022. Overall 10 patients undergoing shoulder arthroplasty where ultrasound-guided stimulating catheter was inserted close to N. Suprascapularis were included in the study. Within the recovery room, the treatment group received 10 minutes long nerve stimulation twice, before shoulder movement and after. The control group received 37.5 mg of Ropivacaine via a catheter. Groups were compared between each other. The Analgesia Nociception Index (ANI) was used for the pain assessment – instantaneous (ANi) and mean (ANIm). The Numeric Rating Scale (NRS) – subjective pain experience – patients rated pain from 0 (no pain) to 10 (worst pain). For the analysis of data we used the IBM SPSS 27.0 version.

Results. After stimulation mean values in the treatment group – before movement ANIm – 62.20, ANi – 61, after shoulder movement ANIm – 68.80, ANi – 70. In the control group, the mean values were ANIm – 64.60, ANi – 64.20 after pharmacological treatment ANI indexes were also compared to pharmacological treatment – there was no statistically significant difference compared to stimulation, in both situations, in rest and after movement. Although NRS values were compared in the same way – in both groups there was no statistically significant association ($p < 0.05$).

Conclusions. Both groups are equivalent and equally successful in pain relief, therefore future research would be needed to conduct a more comprehensive analysis of the use of this nerve stimulation method on a daily basis.

SOURCES OF INFORMATION AND PERCEPTION TOWARDS EPIDURAL ANALGESIA OF PRIMIGRAVID PARTURIENTS

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Keywords. Epidural analgesia

Objectives. Epidural analgesia is considered to be the gold standard for labor analgesia. This study aims to assess the perception, sources of information and attitude regarding epidural analgesia among primigravid women.

Materials and Methods. A cross-sectional study was conducted at the Hospital of Lithuanian University of Health Sciences Kaunas Clinics in November 2022 by distributing 53 pre-designed questionnaires. The data of women with first-time vaginal delivery were analyzed using IBM SPSS Statistics 27. Data for qualitative variables are presented by indicating the frequency – number of respondents (n) and percentage expression. Means and standard deviation values of quantitative variables are presented. Chi-square (χ^2) criterium represents differences between the groups. Results were statistically significant when $p < 0.05$.

Results. The average age among women was 27.9 (SD 4.5). More than half of the women had higher education 41 (77.4%). 40 (75.5%) of the respondents live in the city, 46 (87.4%) named their income as average and sufficient. 40 (75.5%) women thought that epidural analgesia was the most effective method of pain management, 39 (73.6%) women considered pain management the main reason for requesting epidural analgesia. 19 (35.8%) mentioned the possible risks for newborns and 16 (30.2%) side effects for mothers as their main concern. The internet was the main source of information for 25 (47.2%) women. 23 (35%) women were undecided about requesting epidural analgesia in the future, 24 (44%) said yes and 6 (21%) said no. The source of information was not associated with the decision to use an epidural ($p > 0.05$). Age, education, income and place of residence were not significantly associated with primigravid women's decision to choose or not to choose an epidural or willingness to receive epidural analgesia in the future ($p > 0.05$).

Conclusions. More than two-thirds of women agree that epidural analgesia is the most effective method for labor pain management. The Internet remains the main source of information for primigravid women.

COMPARISON OF ARTERIAL AND VENOUS BLOOD GAS ANALYSIS IN NEUROSURGERY PATIENTS

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Keywords. Blood gas; Arterial; Venous; Neurosurgery

Objectives. Obtaining BGA is important in the treatment of critically ill patients. Arterial sampling is the traditional way, but it has disadvantages, e.g., pain and difficulties in sampling when there is a weak pulse. Therefore, there's been research into using VBG instead of ABG. The aim of this study was to evaluate whether there's a difference between pH, BE(B), BEecf, lactate, glucose, sodium, potassium, chloride, and calcium between ABG and VBG in neurosurgery patients.

Materials and Methods. This prospective observatory clinical trial was performed in the surgical unit of Riga East Clinical University Hospital. Paired ABG and VBG samples were compared from 19 adult neurosurgery patients. Informed consent was obtained from each participant. Patient characteristics and information on the surgery and anaesthesia were collected from medical documents. The ABG and VBG samples were taken within 5 minutes from each other and analysed by GEM® Premier 4000 blood gas analyser. ABG was taken from a. radialis and VBG from a peripheral vein. pH, BE(B), BEecf, lactate, glucose, sodium, potassium, chloride, and calcium values were compared between the arterial and venous samples by IBM®SPSS® Statistics software version 28.0.1.00 by using Wilcoxon signed-rank test. The statistical significance was defined as $p < 0.05$.

Results. No statistically significant differences were found between the arterial and venous BEecf ($Z = -1.552$; $p = 0.121$), sodium ($Z = 0.551$; $p = 0.582$), potassium ($Z = 1.184$; $p = 0.236$), and calcium ($Z = 1.912$; $p = 0.056$) values. There were statistically significant differences between the ABG and VBG values for pH ($Z = -2.815$; $p = 0.005$), BE(B) ($Z = -2.396$; $p = 0.017$), lactate ($Z = 3.001$; $p = 0.003$), glucose ($Z = -3.145$; $p = 0.002$), and chloride ($Z = -2.961$; $p = 0.003$).

Conclusions. According to these results ABG and peripheral VBG can be used interchangeably for the evaluation of BEecf, sodium, potassium, and calcium. For pH, BE(B), lactate, glucose, and chloride ABG and VBG cannot be used interchangeably. However, due to limitations, e.g., small sample size, the results of this study shouldn't be directly applied into clinical practice.

ORGAN FAILURE ASSESSMENT IN INTENSIVE CARE UNIT COMPARING INFECTIVE ENDOCARDITIS PATIENTS AFTER CARDIAC SURGERY TO PREDICT OUTCOME

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Keywords. Infective endocarditis; Intensive care; Outcome

Objectives. In infective endocarditis (IE) cardiac surgery is employed as a life saving measure. To predict early mortality after the cardiac surgery for IE various validated risk scores have been designed; however, long-term survival has received less attention. In various IE cases the causative microorganism cannot be found; therefore the aim was to compare the postoperative outcomes for IE patients who had either blood culture positive endocarditis (BCPE) or blood culture negative endocarditis (BCNE), and to further evaluate if sequential organ failure assessment (SOFA) score could be a reliable tool to predict mortality of IE patients post-operatively in the ICU and long-term (12–36 months).

Materials and Methods. Medical records from 57 patients who underwent the cardiac surgery for IE from 2015 to 2019 in Pauls Stradiņš Clinical University Hospital were analyzed. Patients were divided into two groups – BCNE and BCPE and evaluated using SOFA score during their intensive care unit (ICU) stay, on the day of the admission and on the last day. For both groups correlation was assessed between SOFA score result, ICU stay-time, hospitalization period and mortality. Spearman's correlation coefficient and frequency analysis (Pearson's Chi-Square Test) were used to analyze SOFA results by each group.

Results. In the study there were 39 BCPE and 18 BCNE patients, with an average age of 55 (SD ± 15), of which 73.7% were male. The result of the Chi-square test shows the relationship between the SOFA measured on the last day in the ICU and higher mortality during 3 years in the BCPE group.

Conclusions. A higher SOFA scale in the BCPE group predicts a longer ICU stay time and affects the long-term outcome but doesn't change the length of hospitalization. The SOFA score of the last day in ICU is a reliable tool to predict long-term mortality in the BCPE patient population.

SAPS II SCORE, REMDESIVIR USE AND THEIR ASSOCIATIONS WITH TREATMENT OUTCOME IN ICU PATIENTS INFECTED WITH SARS-COV-2 VIRUS

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Keywords. Intensive care; SAPS II; Remdesivir

Objectives. This study aims to investigate SAPS II score, remdesivir use and their associations with treatment outcome (ICU mortality/survival) in patients infected with SARS-CoV-2 and treated in the Intensive Care Clinic of Hospital of LUHS Kauno Klinikos in year 2020.

Materials and Methods. Retrospective analysis of 103 patients admitted to the Hospital of LUHS Kauno Klinikos Intensive Care Clinic between April and December 2020 was performed. Inclusion criteria: ≥ 18 y/o, confirmed SARS-CoV-2 infection, testing for SAPS II scale performed. IBM SPSS Statistics 23.0 was used. Pearson, point-biserial correlations, χ^2 , Student's t-tests, ROC-AUC curve, two-way ANOVA were used. Result was considered statistically significant at $p < 0.05$.

Results. 51.46% ($n = 53$) of subjects were male, 48.54% ($n = 50$) were female. Mean age was 65.50 ± 1.36 years (range 20–92), length of hospitalisation – 6.97 ± 0.60 days (range 1–29). 63.11% ($n = 65$) of patients have died. No statistically significant correlation was found between duration of hospitalisation or age with patients' mortality ($p > 0.05$). Mean SAPS II score was 42.52 ± 1.72 (deceased – 49.20 ± 1.92 , survivors – 31.11 ± 2.34), average predicted mortality rate was 34.77%. Statistically significant moderate correlation was found between higher SAPS II scores and mortality ($r = 0.501$; $p < 0.001$), with ROC-AUC curve value at 0.807. Remdesivir was administered to 27.18% ($n = 28$) of subjects, while others (72.82%; $n = 75$) were not treated with this drug. There was no statistically significant difference between different treatment groups regarding SAPS II score, age or sex ($p > 0.05$). No statistically significant difference in survival was observed considering use of remdesivir (with remdesivir – 21.43% ($n = 6$); without remdesivir – 42.67% ($n = 32$); $p > 0.05$).

Conclusions. There is significant moderate correlation between higher SAPS II scores and SARS-CoV-2 infected ICU patients' mortality. ICU patients infected with SARS-CoV-2 have a higher mortality rate than predicted by SAPS II scale. In our small-sample retrospective study remdesivir had no statistically significant effect on survival in SARS-CoV-2 infected ICU patients.

HEMADSORPTION EFFECT ON THE OUTCOME OF PATIENTS WITH SEPTIC SHOCK

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Keywords. Sepsis; Hemofiltration; Blood purification; Mortality; Outcome

Objectives. Sepsis and septic shock are one of the leading causes of death worldwide accounting for more than 5.3 million deaths annually. Blood purification methods have been developed and are one of the most promising in septic shock treatment. Our objectives were to determine hemoadsorbent effect on the outcome of patients with septic shock.

Materials and Methods. Mono-center, retrospective study in patients with septic shock treated with Oxiris PrismaFlex CRRT hemofiltration or combining CRRT Oxiris PrismaFlex with CytoSorb. 86 patients met the criteria to be included in this research (42 Oxiris group, 44 Oxiris+CytoSorb group). 28 patients (32.6%) were cardiac surgery patients, 58 (67.4%) non-cardiac. Mortality, in hospital time, ICU time, duration of hemoadsorbent therapy were primarily evaluated.

Results. Mortality rate was higher in Oxiris+CytoSorb group (52.38% (22 of 42) Oxiris group (34.10% (15 of 44)). Cardiac surgery group (32.14% (9 of 28)) had a lower mortality rate than non-cardiac group (48.28% (28 of 58)). In hospital time was almost identical (Oxiris 37.52 ± 3.35 , $p = < 0.001$; Oxiris+CytoSorb 38.36 ± 4.03 , $p = 0.005$). ICU time (Oxiris 16.83 ± 2.38 , $p = < 0.001$; Oxiris+CytoSorb 23.11 ± 2.53 , $p = < 0.001$), duration of hemoadsorbent therapy (Oxiris 9.00 ± 0.70 , $p = 0.037$; Oxiris+CytoSorb 7.40 ± 0.79 , $p = 0.001$) was shorter in Oxiris+CytoSorb group but displayed asymptomatic significance in cardiac surgery vs non-cardiac group ($p > 0.05$). 29 Oxiris group patients survived against Oxiris+CytoSorb 20 patients. ICU time (Oxiris 24.59 ± 3.70 , $p = < 0.001$; Oxiris+CytoSorb 15.50 ± 2.76 ; $p = 0.005$), duration of hemoadsorbent therapy (Oxiris 8.69 ± 0.92 ; $p = 0.029$; Oxiris+CytoSorb 6.85 ± 1.03 ; $p = < 0.001$) was shorter in Oxiris+CytoSorb group

Conclusions. Patient primary diagnosis does not affect ICU time and duration of hemoadsorbent therapy. Oxiris+CytoSorb group patients ICU time was shorter by 6.3 days overall due to severe polymorbidity; 9.1 days in the survivor group, length of therapy with hemoadsorbents was shorter by 1.6 days overall; 1.8 in the survivor group. Oxiris+CytoSorb had a higher mortality rate of 18.3%.

ACUTE PULMONARY EMBOLISM: THE MOST COMMON SYMPTOMS, CLINICAL SIGNS AND ECG CHANGES

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Keywords. PE; Pulmonary embolisms; ECG; Revised Geneva score; McGinn-White sign

Objectives. Acute pulmonary embolism (PE) is a medical emergency. Prehospital diagnostics of acute PE is challenging and is based on patient's history, clinical presentation and electrocardioscopy. Some tools, such as Revised Geneva score, may be used to identify patients with high risk of acute PE based on clinical variables, however they are still of limited use. The aim was to evaluate the prevalence of the most common symptoms, signs and electrocardiographic changes in patients with acute PE.

Materials and Methods. The retrospective study included 71 patients of Emergency Department of Riga East University Hospital "Gailezers" in 2017 to 2019. PE diagnosis was established by CT angiography. The medical records were analysed to find the most common symptoms, signs, and ECG changes associated with acute PE. Revised Geneva score was used to evaluate PE probability in these patients. Descriptive statistic was made with IBM SPSS.

Results. Abnormal vital signs as tachycardia, tachypnoea and desaturation were found in 56%, 33% and 49% of cases respectively. The most common complaints were dyspnoea (found in 83.1% of cases), chest pain (in 31%), exercise intolerance (in 21.2%). 38% of ECG records showed sinus tachycardia, 51% T segment inversion in V1-V3 leads, 16% S1Q3T3 or McGinn-White sign. According to Revised Geneva score, the probability of PE was "low" in 4.2%, "moderate" in 85.9% and "high" in 9.9% of cases.

Conclusions. Acute PE may be present with abnormal vital signs (tachycardia, tachypnoea, desaturation) and patients complains of dyspnoea, chest pain, exercise intolerance. Tachyarrhythmias and inverted T wave in V1-V3 are the most common ECG changes, however McGinn-White sign may be rarely seen.

EVALUATION OF RISK FACTORS OF 28-DAY MORTALITY IN BACTERIAL SEPTIC SHOCK PATIENTS TREATED WITH ADSORPTIVE HEMOFILTRATION: AN OVERVIEW OF CLINICAL EXPERIENCE IN INTENSIVE CARE UNIT IN PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL IN RIGA, LATVIA

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Keywords. Adsorptive hemofiltration; oXiris® membrane; Continuous renal replacement therapy; Intensive care unit; Gram-negative septic shock patients

Objectives. Adsorptive hemofiltration with oXiris® membrane has been proposed to manage unbalanced immune response in septic patients additionally to continuous renal replacement therapy (CRRT). The goal of this study was to describe patients treated with oXiris® membrane in P.Stradins CUH ICU in 2022 and assess risk factors affecting mortality.

Materials and Methods. Demographic, clinical and laboratory data of septic shock patients caused by gram-negative bacteria admitted to P.Stradins CUH ICU in 2022 were retrospectively analysed. Hemofiltration with oXiris® hemofilter were used in all study patients for CRRT.

Results. Twenty-five patients were included in the study. Median age was 65 [IQR 44–71] years. Fifteen (60%) were male and ten (40%) were female. Fifteen (60%) patients had more than two comorbidities, predominated by type II diabetes (n = 9), chronic heart failure (n = 8) and primary arterial hypertension (n = 8 patients). On admission to ICU, the median Sequential Organ Failure Assessment (SOFA) score was 11 [IQR 10–13]. Abdominal infection (n = 11) was the most common source of sepsis in this study, followed by urinary tract infection (n = 4). The most commonly identified organisms were Escherichia coli (n = 8 patients), Klebsiella pneumonia (n = 5 patients) and Acinetobacter baumannii (n = 4). The median time between ICU admission and the start of hemofiltration was 17 hours [IQR 12–36], The median length-of-stay in ICU was 12 days [IQR 8–32.5] and hospital length-of-stay was 29 days [IQR 15.5–53]. Hemofiltration related adverse events were not observed. 28-day mortality was 36% (n = 9). Performing logistic regression analysis only SOFA score was considered as independent factor for 28-day mortality (< 0.05).

Conclusions. Adsorptive hemofiltration with oXiris® filter could be used in gram-negative septic shock patients required CRRT, but present study does not show effect on 28-day mortality.

EVALUATION OF MICROCIRCULATION USING REMOTE PHOTOPLETHYSMOGRAPHY AND AUTOMATED CAPILLARY REFILL TIME MEASUREMENT IN SEPTIC SHOCK PATIENTS COMPARISON WITH COVID-19

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Keywords. Septic shock; COVID-19; Remote photoplethysmography; Automated capillary refill time

Objectives. Microcirculation assessment during fluid resuscitation mainly rely on the clinical and laboratory testing such as serum lactate level which is non-specific and manual capillary refill time (mCRT) which is operator-based method. The aim was to assess microcirculation during fluid resuscitation in patients with bacterial septic shock (BSS) and severe COVID-19 using remote photoplethysmography (rPPG) and automated objective capillary refill time (aCRT) measurement technique.

Materials and Methods. Patients with positive passive leg raising test (PLRT) were initially resuscitated with crystalloids. Hemodynamic variables, mCRT, aCRT parameters (T90–time when 90% of capillary refill is over, Tst–time when capillary refill is fully over), peripheral perfusion index (PPI) detected using rPPG were collected before/after PLRT and after volume expansion (VE).

Results. A total of 34 patients were divided into 2 groups: COVID-19 (n = 18) and BSS (n = 16). In COVID-19 mean PPI increased during PLRT by 7% (from 43 ± 27 to 46.5 ± 29.1), by 15% after VE (from 43.0 ± 27.8 to 49.5 ± 22.6). In BSS PPI increased during PLRT by 18% (from 28.3 ± 20.9 to 33.6 ± 25.3), by 28% after VE (from 28.3 ± 20.0 to 36.3 ± 25.8). Mean mCRT in COVID-19 decreased by 22% during PLRT (2.57 ± 0.59 to 1.98 ± 0.68), by 22% after VE (from 2.57 ± 0.59 to 1.98 ± 0.78). In BSS decreased by 31% during PLRT (from 1.85 ± 0.64 to 1.29 ± 0.38), by 32% after VE (from 1.85 ± 0.64 to 1.26 ± 0.29). Mean aCRT T90 in COVID-19 decreased by 32% during PLRT (from 1.74 ± 1.16 to 1.17 ± 0.79), by 17% after VE (from 1.74 ± 1.16 to 1.45 ± 1.06), in BSS decreased by 41% during PLRT (from 1.93 ± 1.03 to 1.38 ± 0.79), by 8% after VE (from 1.93 ± 1.03 to 1.78 ± 0.66). Mean Tst in COVID-19 decreased by 21% during PLRT (from 3.33 ± 1.59 to 2.63 ± 1.37), by 10% after VE (from 3.33 ± 1.59 to 3.03 ± 1.44), in BSS decreased by 25% during PLRT (from 3.74 ± 1.24 to 2.81 ± 1.22) by 2% after VE (from 3.74 ± 1.24 to 3.69 ± 1.12).

Conclusions. The initial PPI was higher in the COVID-19 group, however BSS group showed a greater percentage-wise increase in PPI after VE, indicating a better response to VE.

DO WE HAVE CHANGES IN THE CEREBRAL REGIONAL OXYGEN SATURATION WHILE UNDERGOING CAROTID ARTERY ENDARTERECTOMY?

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Keywords. Carotid artery endarterectomy; Cerebral oxygenation

Objectives.

1. To assess cerebral tissue oxygenation in neurosurgical patients having carotid endarterectomy using near-infrared spectroscopy (NIRS).
2. To assess the relationship between end-tidal carbon dioxide (EtCO₂) and near-infrared spectroscopy (NIRS).
3. To analyze how frequently patients having carotid endarterectomy in the field of neurosurgery experience episodes of desaturation of the cerebral tissue, as well as any potential causes of this desaturation.

Materials and Methods. The study was conducted at the Hospital of LUHS Kaunas Clinics Anesthesiology department. Twenty individuals who had carotid artery endarterectomy were included in the study. Measurements recorded after induction, before first surgical incision, after clamping of carotid artery of the operated side, (4) after restoration of carotid artery blood flow, before extubation or before transferring the not extubated patient to the intensive care unit. All patients were prepared for surgery according to a standard protocol, with additional NIRS sensors in the forehead area. MAP, SpO₂, EtCO₂, and rSO₂ were monitored during the procedure.

Results. A marginal and statistically insignificant correlation between NIRS and MAP was discovered by the study. While there was no correlation between SpO₂ and NIRS, there was a relatively high and statistically significant correlation when looking at the relationship with EtCO₂. One-fifth (N = 4) of all patients experienced outbreaks of brain desaturation. The left carotid artery's functioning showed the most abnormalities (N = 3).

Conclusions.

1. After clamping the carotid artery of the operated side, patients' lowest NIRS readings (lowest regional oximetry values) were discovered.
2. There is a statistically significant and relatively strong connection between rSO₂ and end-tidal exhaled carbon dioxide (EtCO₂). Therefore, it may be claimed that as EtCO₂ concentration rises, the body works to oxygenate the brain tissue better and guard against potential desaturation.
3. Throughout the entire carotid endarterectomy process, episodes of brain tissue desaturation are possible.

LOCAL ANAESTHETIC TOXICITY FOLLOWING ROPIVACAINE INFILTRATION DURING TOTAL KNEE REPLACEMENT SURGERY, USING TOURNIQUET

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Keywords. Local anesthetic toxicity; Recommended maximum dose; Infiltration

Introduction. Local anesthetic-induced toxicity is extremely rare complication, but there are cases of serious consequences.

Case Description. 77 years of female patient was admitted with a referral from a family doctor with complains of pain in the left knee, which become more intense at the motions, as well as morning stiffness and night pain. The patient has a history of TIA, postmenopausal osteoporosis, PAH, CHF, and kidney stones. Length – 155 cm, wight – 50 kg. The patient notes an allergy to lidocaine. General objective condition normal. Left knee replacement is planned. The patient receives spinal anesthesia with Bupivacaine 0.5% – 3.6 mL in lumbar interspace L4–L5. Infiltration anesthesia of the knee joint with Ropivacaine 0.75% – 30 mL, diluted up to 140 mL with saline and tranexamic acid 1g is performed by orthopedic surgeon before releasing of tourniquet. Patient suddenly developed neurological symptoms – vertical nystagmus and ataxia after releasing of tourniquet and was transferred to the ICU with preliminary diagnosis of transitory ischemic attack. Neurologist notes that the patient is sleepy, complaining about metallic taste in the mouth, dysesthesias in the whole body. Objectively, the patient answers the questions, orders are executed. Fingernose rehearsal performed satisfactorily. Active leg movement is missing, sensory disturbances in the lower leg and foot. There is no conclusive data on acute cerebral pathology. The decision about acute local anesthetic neurologic toxicity was made.

Summary. Based on the wight and height of the patient and the dose of Ropivacaine selected, it may be concluded that the dose has been chosen too big for this patient. The recommended maximum dose of Ropivacaine is 3 mg/kg. In this, the recommended maximum dose for this patient would be around 150 mg but the patient was given 225 mg.

Conclusions. It is very important to take precautions and calculate correctly the right amount local anesthetic.

EPINEPHRINE-INDUCED ARRHYTHMIA DURING ARTHROSCOPIC SHOULDER SURGERY: A CASE REPORT

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Keywords. Anesthesiology; Local anesthetic

Introduction. During arthroscopic surgery of the shoulder joint, local anesthetics with epinephrine are administered before the insertion of the trocar. The purpose of injection is to reduce pain and bleeding and enhance the visibility of the surgical field.

Case Description. The 64-year-old male admitted for elective surgery, complained about shoulder pain for several years. He was diagnosed with rotator cuff damage of the left shoulder joint, left shoulder joint m. biceps tendinopathy and superior labral anterior-posterior (SLAP) tear. Conservative treatment was without significant improvement. The general condition of the patient at the beginning of the surgery was stable, with a heart rate of 52 BPM and BP of 130/65 mmHg. In order to monitor vital signs, invasive arterial pressure measurement is provided. The surgery is performed under general anesthesia and P.Brachialis anesthesia with Ropivacaine 0.75% – 15 mL. Before the placement of the trocar, the surgeon performs injection with Epinephrine 1 mg + Lidocaine 100 mg and NaCl 0.9% 10 mL. Suddenly patient becomes hemodynamically unstable, supraventricular extrasystoles (SVES) < ventricular extrasystoles (VES), Supraventricular tachycardia (SVT) 155 BPM, BP 240 / 140 mmHg. Intraarticular anesthesia is discontinued. Patient was treated with Betolac 5 mg i/v and Nitrocin i/v in perfusion. Surgery was canceled. In 25 minutes, the patient's condition is stabilized, heart rate of 60 BPM, and BP of 140/70 mmHg. The patient was discharged next day for further treatment.

Summary. The infiltration of dilute epinephrine solution has been used for many years to provide hemostasis. However, intravascular epinephrine has adverse cardiovascular effects, such as arrhythmia, pulmonary edema, and even cardiac arrest.

Conclusions. It is important to reduce the possibility of local anesthetic and epinephrine administration in the blood vessels during intraarticular anesthesia, as it can be a significant threat to the patient. Intraoperative sonography, injection under direct vision control and careful aspiration might be suggested.

FREQUENCY OF POSTOPERATIVE PLEURAL EFFUSION AFTER CORONARY ARTERY BYPASS GRAFT AND HEART VALVE REPLACEMENT SURGERY

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Keywords. Cardiothoracic surgery; Cardiopulmonary bypass; Pleural effusion

Objectives. Postoperative pleural effusions are common in patients who undergo cardiac surgery. Several risk factors have been identified to have an impact on pleural effusion development. Aim of this study was to identify connection between an open-heart surgery type and postoperative pleural effusion.

Materials and Methods. 356 patients who underwent an open-heart surgery with cardiopulmonary bypass were included. Chest radiography images before surgery and 12 hours after surgery were analyzed. Type of surgery (coronary artery bypass graft (CABG), valve replacement or combined surgery) were associated with postoperative pleural effusion. Patients with pathological chest radiograph prior to surgery were not included.

Results. 356 patients with mean age 65 (SD \pm 10) years were included in the study, 142/356 of them were female. 246/356 (69%) patients with postoperative pleural effusion were identified. 24 patients (8.9%) had CABG, 119 patients (44.1%) had heart valve replacement surgery, 103 patients (38.1%) had both. 12 h after CABG surgery unilateral pleural effusion was identified in 14.9% (dx – 7.8 vs sin – 7.1%) bilateral in 8.2% cases. 12 h after valve replacement surgery unilateral pleural effusion was identified in 75.4% (dx – 38.1 vs sin 37.3%) bilateral 41.0% (Chi – Square test; $p = 0.005$). 12 h after combined surgery unilateral pleural effusion was identified in 65.2% (dx – 32.2 vs sin – 33.0%) bilateral 36.7% (Chi – Square test; $p < 0.001$).

Conclusions. Pleural effusion is a common complication after open heart surgery. Patients who undergo isolated heart valve replacement surgery and combined heart surgery are at greater risk for postoperative pleural effusion development.

MECHANICAL ASPHYXIA IN CONDITIONS OF CARDIOPULMONARY RESUSCITATION. A CASE REPORT

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Keywords. Autopsy; Mechanical asphyxia; Cardiopulmonary resuscitation; Fracture of the hyoid bone

Introduction. Research results indicate that the rate of complications and injuries after cardiopulmonary resuscitation ranges from 21% to more than 65%. Thoracic and rib fractures are the most commonly reported complications of external cardiac massage or chest compressions. The following case history deals with a case of mechanical asphyxia due to a compression of the neck organs and a fracture of the hyoid bone in conditions of CPR.

Case Description. A husband found his 40-year-old wife lying on her back with no signs of life. According to the husband, both had used narcotic substances. The husband started CPR – performed breathing and chest compressions. Ambulance was called, and reported the death of a woman. The autopsy revealed that death was caused by mechanical asphyxia. During CPR, the neck was compressed with the fingers of the hand, which caused a life-threatening condition – external breathing disorders, which resulted in mechanical asphyxia and death. This is also evidenced by an incomplete fracture of the left big horn of the hyoid bone with hemorrhage in the soft tissues, which could have occurred shortly before death, and signs of general asphyxia. No narcotic substances or ethyl alcohol were detected in the blood of the corpse.

Summary. Reported case demonstrates that improper cardiopulmonary resuscitation can lead to external compression of the neck organs, which can lead to mechanical asphyxia and death.

Conclusions. In most cases, mechanical asphyxia is caused by compression of the chest and/or abdomen by a large weight, compression of the body in a confined space, as well as strangulation and suffocation. There are only a few published cases of mechanical asphyxia during CPR. Since such cases are very rare, a thorough investigation by forensic experts as well as the police is necessary.

ANAESTHESIA AND POSTOPERATIVE PAIN MANAGEMENT FOR A PATIENT WITH OPIOID ALLERGY

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Keywords. Opioids; Allergy; Chronic pain

Introduction. Opioid allergy is a serious medical condition, requiring careful examination to select appropriate pain relief for patients with chronic pain and prepare perioperative analgesia. This case report aims to analyze the management of general anaesthesia and postoperative analgesia for patients with opioid allergy.

Case Description. A 65-year-old male patient with subacute mandibular periostitis, caused by radiation therapy, was admitted to Pauls Stradins CUH. The patient's diagnosis was prostatic cancer with metastasis – for pain relief patient received Fentanyl s/c, Tramadol p/o, and Prednisolone p/o. However, the patient was previously diagnosed with multiple true allergies to pain medication, including fentanyl, metamizole, lysthenon and various antibiotics. The patient underwent teeth extraction surgery due to infection under general anaesthesia. The patient previously underwent an endoscopic procedure, where he received opioids with no complications. Before induction Dexamethasone, 12 mg i/v was given. For induction patient received Sol. Propofol 200 mg i/v, Fentanyl 0.15 mg i/v and Mivacoron 20 mg i/v. During the maintenance of anaesthesia, hemodynamics were stable – there were no signs of allergic reactions. After the surgery, the patient was admitted to the general surgery ward. For postoperative analgesia, the patient received analgesia with NSAIDs and subcutaneous Fentanyl for severe pain. The patient was discharged without postoperative complications.

Summary. Oncological patients with multiple metastases and opioid allergies, can make daily pain management and analgesia during surgery more complicated.

Conclusions. Patients with opioid allergies have a higher risk of allergic reactions during the perioperative period. Intravenous Dexamethasone before induction of anaesthesia can lower the risk of allergic events during the surgery.

SUSTAINABILITY IN ANAESTHESIA AND CRITICAL CARE IN LATVIA: SURVEY

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Keywords. Survey; Environment

Objectives. To make anaesthesia and critical care sustainable it needs to be balanced between benefit for the patient, economic and environmental costs. The aim was to identify frequency and usage of inhaled anaesthetics, single-use materials, and a proper disposal of drugs, CO₂ absorbents and biological waste. Anaesthesiologists – reanimatologists and critical care physicians are in authority to make healthcare sustainable.

Materials and Methods. We surveyed Latvian anesthetists, residents with online platform Survey Monkey. 72 were surveyed in the age from 25–60 years.

Results. 53% of responders use N₂O. 90% prefer to use Sevoflurane, 57% out of those use it daily. 82% avoid using Desfluran. 62% dispose CO₂ absorbents in biological waste, 36% in special containers, 6% in domestic waste. 73% replace CO₂ absorbents when 1/3–2/3 of the colour has changed, 42% when hypercapnia persists, 35% when EtCO₂ increases. 76% dispose prepared, but not administered drugs in biological waste, 25% in specialized sink, 18% in usual sink. 83% dispose the drug after administration in biological waste, 19% in specialized sink, however 18% in usual sink. 62% use 3–6 gloves for one patient, 18% 7–10 gloves, 14% more than 10 gloves.

30% 21–30, 25% 10–20, 31–40 and over 50 use 12%. About 80% use disposable caps and face masks daily, 75% respirators. 64% use apron and 57% disposable smock daily, 47% change it less than 2 times a day, 33% change it 3–5 per day. 75% dispose single-use materials and linen in biological waste, 25% in special containers, 8% in domestic waste.

Conclusions. Most preferred inhaled anesthetic is Sevoflurane, followed by N₂O, then Desflurane. None of the respondents know all of the criteria that indicates CO₂ absorbent needs be changed. A significant amount of all respondents (18%) dispose of left over drugs in a regular sink, that is not meant for medical waste. The survey indicates that the knowledge about proper disposal of medical waste is insufficient.

EARLY HISTOLOGICAL CHANGES IN THE WALL OF THE SMALL INTESTINE IN A RAT MODEL OF ISCHEMIA

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Keywords. Acute mesenteric ischemia; Villous epithelium; Hypoxia

Objectives. As a result of acute mesenteric ischemia, intestinal blood supply is disturbed, which causes metabolic damage, permanent damage of small intestine leading to short bowel syndrome. Various modern treatment methods can be used to treat the disease, such as angiography, intraoperative stenting of damaged blood vessels. The problem is timely diagnosis of the disease. To better understand mechanism of the disease, it is necessary to know how long after ischemia the first changes in the intestinal wall began (Yu H, Kirkpatrick IDC, 2022).

Materials and Methods. Procedure was performed in accordance to EU Directive 2010/EU/63, approved by Food and Veterinary service of Latvia No. 120/2020. Ligation of superior mesenteric artery and vein was performed under inhalation anesthesia using Isoflurane mixed with 30% O₂, analgesia with Buprenorphine 0.3 mg/kg subcutaneously. Wistar Hannover male rats were divided into following groups: 15, 30, 60 min ischemia, sham (n = 7–10). Histological jejunum wall investigation was performed under light microscope using hematoxylin, eosin stain. Changes in the intestinal wall were evaluated according to Chiu's scheme (Sengul et al., 2013).

Results. 15 minutes: mucosal injury – from development of subepithelial (Gruenhagen's) spaces near the apex of villus to denuded villi with exposed lamina propria and dilated capillaries. 30 minutes: mucosal injury ranged from development of subepithelial (Gruenhagen's) spaces near the apex of villus, congestion in the capillaries to breaking into pieces of lamina propria with hemorrhage and ulceration. 60 minutes: jejunal wall mucosa injury ranged from intensive separation of epithelium to breaking into pieces of lamina propria with hemorrhage and ulceration. Sham group: intestinal mucosa was normal without signs of inflammation, hyperemia and hemorrhage.

Conclusions. The first changes induced by hypoxia were observed after 15 minutes of hypoxia confirming the intestinal villous epithelium sensitivity to hypoxia.

ANTIMICROBIAL PEPTIDES AND INTERLEUKINS IN CLEFT PALATE

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Keywords. Interleukin 10; Human beta defensins; Cathelicidin, cleft palate

Objectives. Cleft lip and palate remains one of the most common paediatric congenital anomalies with consequences on anatomical and physiological aspects, as well as on psychosocial functioning. The role of protective tissue factors in its pathophysiology is still debated, hence the goal of our study was to investigate the appearance and distribution of interleukins and antimicrobial peptides in cleft palate tissues.

Materials and Methods. Samples of soft palate were obtained from 8 children with cleft palate and/or lip – 3 girls and 5 boys aged 4 to 12 years. Additionally control samples were gathered from 2 male and 3 female subjects aged 40 to 60 years without any pathology of face and neck. Tissues were immunohistochemically stained for LL-37, IL-10, HBD-2, HBD-3, HBD-4 and CD-163 and slides were examined by light microscopy. For evaluation of statistical differences between patients and controls Mann-Whitney U test was performed. Spearman's rank correlation coefficient was used to detect correlations between studied factors.

Results. Statistically significant difference between patient and control soft palate epithelium and connective tissue was observed for IL-10 and HBD-2, yet HBD-4 showed the difference in connective tissue. Out of these factors, highest number of positive cells in epithelium was for IL-10 and in connective tissue all three factors – IL-10, HBD-2 and HBD-4 – showed moderate number of positive cells. LL-37 varied from mostly moderate to numerous positive cells in patient and control tissues. Spearman's rank correlation coefficient revealed multiple positive correlations between the factors in cleft affected tissues.

Conclusions. An increase of antimicrobial proteins HBD-2 and HBD-4 and anti-inflammatory cytokine IL-10 suggests the wide compensatory elevation of local immune system against the cleft-raised tissue changes. The observed correlations between the studied factors prove the mutual involvement of common local defense factors into the morphopathogenesis in postnatal cleft palate.

CHARACTERISTICS OF CUTANEOUS MELANOMA WITH SENTINEL LYMPH NODE METASTASES

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Keywords. Cutaneous melanoma; Sentinel lymph nodes; Metastases

Objectives. Cutaneous melanoma (CM) is a malignant skin tumor originating from altered melanocytes and metastasizing quickly to the sentinel lymph node (SLN). The incidence of CM is increasing, 10-year survival rate reaches 95%, with SLN metastases – 88%. SLN metastases are more common in patients with superficial spreading or nodular melanoma, as well as larger Breslow depth. The purpose of this study is to evaluate CM characteristics with SLN metastases diagnosed in the Department of Pathology of Lithuanian University of Health Sciences (LUHS) Hospital in 2002–2021.

Materials and Methods. 154 patients were diagnosed with CM and SLN metastases in 2002–2021 at the Department of Pathology (LUHS). Patients were divided into groups by age (≤ 44 , 45–64, 65–79, ≥ 80 ; mean age 61), CM location (head-neck, upper extremities, abdomen-chest, back-trunk, lower extremities), Breslow depth (< 1 mm, 1–2 mm, 2–4 mm, > 4 mm) and morphological types (superficial spreading, nodular, acral, lentigo maligna, rare). Statistical analysis was performed using IBM SPSS Statistics software.

Results. According to our study metastases in SLN are more frequent in nodular CM (53.7%), in CM of the lower extremities (37%), Breslow depth > 4 mm (51.3%). We determined that there is a significant connection between CM with SLN metastases Breslow depth and CM morphological type and ulceration. Greater Breslow depth was observed in nodular and acral CM (68.7% and 66.7% respectively) compared to superficial spreading CM (17%) ($\chi^2 = 61.01$; $p < 0.001$). Presence of ulceration is more likely when CM with SLN metastases Breslow depth is > 4 mm (61.1%) compared to Breslow depth < 1 mm (2.1%), 1–2 mm (10.5%), 2–4 mm (25.3%) ($\chi^2 = 11.79$; $p = 0.008$).

Conclusions. More often nodular CM metastasize to SLN, when CM is on the lower extremity and Breslow depth is > 4 mm. Also, Breslow depth is associated with morphological type and ulceration in CM with SLN metastases.

MORPHOLOGICAL CHANGES OF THE HEART AND KIDNEYS IN PATIENTS WITH COVID-19

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Keywords. Heart; Kidneys; COVID-19; SARS-COV-2

Objectives. It is known that the SARS-COV-2 triggers a significant cytokine release, which leads to damage of the immune, excretory, cardiovascular and respiratory systems due to an inflammatory reaction and coagulopathy. The aim of research is to study the changes at the morphological level that occur in the heart and kidneys of people who died from COVID-19.

Materials and Methods. A pathomorphological study of 20 corpses with a diagnosis of COVID-19 of different sexes, aged 52–68. Sectional material (heart and kidneys) was collected for further macro- and microscopic examination. Hematoxylin and eosin staining was used for the morphological studies.

Results. Macroscopically, the kidneys of those who died from COVID-19 are enlarged, swollen, their fibrous capsule is tense, easily removed. Microscopic examination of the kidneys shows that the glomerular apparatus of the kidneys is characterized by edema, fibrinoid necrosis of the mesangial matrix. Focal necrosis of the tubular epithelium are with destruction of the basement membranes (tubulorexis), eosinophilic masses and hemorrhages are in the lumen of the tubules, which is characteristic by necrotic nephrosis. Macroscopically, dilation of the heart cavities and signs of myocardial infarction without atherosclerosis of the coronary vessels were observed. Microscopic examination of the heart shows that individual groups of cardiomyocytes featured fragmentation and necrosis with lised cells. There are signs of cardiomyocytes hypertrophy at the background of significant interstitium inflammation, perivascular lipomatosis, leukocyte infiltration, and excessive vessels plethora. Thrombosis phenomenon occurs in medium-sized and small vessels.

Conclusions. Thus, due to the direct effect of the virus on ACE2 (Angiotensin-converting enzyme 2), there are signs of alteration both in the kidneys, in the form of necrotic necrosis, and in the heart under the heading of acute myocardial damage.

COULD ALCOHOL HAVE AN EFFECT ON THE NUMBER OF GLIAL CELLS IN THE HUMAN BRAIN?

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Keywords. Astrocytes; Microglia; Immunohistochemistry; Alcohol consumption

Objectives. Microglia can either play a beneficial role or contribute to microglia-mediated neurotoxicity in the CNS. A persistent stimulus from alcohol can initiate inflammation, which could lead to changes in microglial and astrocyte numbers, thus altering many essential and complex functions in the brain. The aim of this study was to examine numbers of microglia and astrocytes in prefrontal cortex in control and addict groups.

Materials and Methods. We analysed both grey matter (GM) and white matter (WM) areas in 29 autopsies using light microscopy. Anti- Iba-1 antibody was used to detect Iba-1 positive (Iba-1+) microglial cells, and anti-GFAP antibody was used to find GFAP positive (GFAP+) astrocytes, which were then classified as perivascular or diffuse. Three groups – controls, age-matched alcohol users and chronic alcohol users – were created. SPSS Statistics v.28 was used for data analysis.

Results. In all groups, a statistically significantly ($p < 0.05$) more Iba1+ and GFAP+ cells were localized diffusely in the WM. Compared to the control group, most of the diffuse astrocytes in the WM were found in the groups of chronic alcoholics and age-matched alcoholics ($p = 0.024$ and $p = 0.006$, respectively). However, only in the age-matched group was a significant correlation found between the diffuse locations of Iba1+ microglia and GFAP+ astrocytes in the WM and GM ($r = 0.516$, $p < 0.01$ and $r = 0.322$, $p = 0.024$, respectively). In contrast with the control group, in the groups of young and chronic alcohol consumers, a statistically greater number of perivascular localized Iba1+ cells were observed in the GM ($p = 0.015$ and $p = 0.005$, respectively).

Conclusions. The amount of GFAP+ and Iba1+ cells was significantly higher in the alcohol users' group than in controls, which could be related to an alcohol-induced immune response in the cerebral WM. The positive correlation between glial cells in the young alcoholic group reflects cellular interactions that provide for maintaining CNS homeostasis.

MORPHOFUNCTIONAL CHARACTERISTICS OF MICROVASCULAR RET THE PANCREAS ON THE CENTRAL DEPRIVATION OF TESTOSTERONE SYNTHESIS (EXPERIMENT)

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Keywords. Microvascular ret; Pancreas; Triptorelin embonate; Testosterone; Rats

Objectives. The pancreas is the second largest gland of the digestive tract. The triptorelin embonate is used in the treatment of prostate cancer by chemical castration. The purpose of the work is to determine the changes in the microvascular ret of the exocrine part of the pancreas in intact rats under the conditions of experimental simulation of chemical castration.

Materials and Methods. The experiment was conducted on 40 male white rats, they were divided into 2 groups: control and experimental. Animals from the first group were injected subcutaneously with the drug at a dose of 0.3 mg of the active substance/kg of body weight for 30 days, while the second group received a physiological solution. Average values of diameters and cell height were determined using a Biorex-3 microscope with a DCM 900 digital photomicroscope.

Results. Analysis of morphological changes in the microvascular ret of the exocrine part of the pancreas showed certain changes. Arterioles reacted with dilation, which was manifested by an increase in the average diameter of the vessel lumen by 4.12%, compared to the intact group of animals, and their average diameters reached $28.01 \pm 0.63 \mu\text{m}$. The average capillary diameters were enlarged, with an average value of $9.31 \pm 0.21 \mu\text{m}$, increasing by 1.93%. Vascular expansion was observed in the capacitive link of the pancreas, their average diameters were equal to $38.14 \pm 1.62 \mu\text{m}$, increasing by 2.46%, compared to the intact group of animals.

Conclusions. An increased sensitivity of the microvascular ret of the pancreas to the action of the triptorelin embonate was established, which was manifested by dilation of arterioles, an increase in the average diameter of capillaries and expansion of the vessels of the capacitive link. Restoration of morphometric parameters of vessels was not observed.

STRUCTURAL CHANGES OF THE EXOCRINE PART OF THE PANCREAS DURING LONG-TERM BLOCKING OF LUTEINIZING AND FOLLICLE-STIMULATING HORMONES

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Keywords. Exocrine apparatus of the pancreas; Pancreas; Testosterone; Rats

Objectives. Was to find out the reaction of the exocrine apparatus of the pancreas in control rats and under the conditions of experimental modeling of central testosterone blockade by triptorilin in the 1st, 3rd and 6th months of the study.

Materials and Methods. The experiment was conducted on 40 sexually mature male white outbred rats, they were divided into 2 groups: control and experimental. Animals from the first group were injected subcutaneously with dipherelin at a dose of 0.3 mg of the active substance/kg of body weight for 180 days, while the second group received physiological solution. The average values of the outer and inner diameters, the height of epitheliocytes were determined using a Biorex-3 microscope with a DCM 900 digital photomicroscope.

Results. In the 1st month, there was a decrease in the outer diameter without significant changes in the inner diameter, which corresponds to a decrease in the size of the cells. In the 3rd month of the study, we observed an increase in the outer diameter without a change in the inner, compared to the previous term, which indicates the inclusion of compensatory reactions. In the 6th month, there was a decrease in all indicators, the height of exocrinocytes and the average diameter of their nuclei.

Conclusions. The indicators of the control group of animals and the experimental group did not statistically significantly differ on the 3rd month of observation. But on the 1st and 6th months, a decrease in indicators was revealed, in comparison with the control group of animals, to the previous terms of the experimental model, which corresponds to decompensation, a decrease in the activity and functionality of the cellular component of the exocrine apparatus of the pancreas.

MORPHOLOGICAL CHARACTERIZATION OF NIGRAL NEURONS IN CHRONIC ALCOHOLISM CONDITIONS

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Keywords. Substantia nigra; Lipofuscin; Neuromelanin; Nissl substance, Chronic alcoholism

Objectives. One of the two substantia nigra subregions is pars compacta (SNpc), which contains densely packed dopaminergic neurons, that convey neuronal signaling to the striatum. Neuromelanin accumulates in neurons during normal aging but can also have toxic features. Lipofuscin is illustrated as an aging indicator; a Nissl substance is involved in the synthesis of proteins. Long-term alcohol use is linked to altered brain activity and changes in neuronal content, quantity, and distribution. This study aims to analyze the presence and distribution of neuromelanin (NM), lipofuscin (LP), and Nissl substance (NS) in SNpc neurons.

Materials and Methods. Brain autopsy samples (SNpc) from the Latvian State Centre of Forensic Medical Examination were included in control (n = 10), age-matched alcohol users' (n = 14), and chronic alcohol users' groups (n = 18). In routine staining, peripheral or diffuse forms of NM, LP, and NS in nerve cell bodies were examined by a light microscope using ×400 magnification. The SPSS 28.0 program was used for statistical data analysis.

Results. Compared to controls, age-matched and chronic alcohol users demonstrated a significant rise in NM-positive cells ($p < 0.001$) and a notable decline in LP-positive neurons ($p < 0.001$). Compared to an age-matched group, chronic alcohol users displayed notably greater NM distribution diffusely than peripherally ($p < 0.001$). In all groups, there were more neurons with diffusely distributed LP ($p < 0.001$, $p = 0.001$, and $p < 0.001$, respectively). There is a strong correlation between NS-positive neurons and NS diffuse distribution ($r = 0.843$, $p < 0.001$) in the chronic alcoholics' group.

Conclusions. Differences in the number of neurons containing NM could indicate that intensive alcohol use might increase the production of NM, which could have either a protective or toxic role. A relatively equal number of NS-positive cells in all groups could be a sign of neuronal attempts to compensate for the disruption of the neurons' metabolism until its destruction.

EARLY HISTOLOGICAL CHANGES IN THE WALL OF THE SMALL INTESTINE IN A RAT MODEL OF ISCHEMIA

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Keywords. Acute mesenteric ischemia; Villous epithelium; Hypoxia

Objectives. As a result of acute mesenteric ischemia, intestinal blood supply is disturbed, which causes metabolic damage, permanent damage of small intestine leading to short bowel syndrome. Various modern treatment methods can be used to treat the disease, such as angiography, intraoperative stenting of damaged blood vessels. The problem is timely diagnosis of the disease. To better understand mechanism of the disease, it is necessary to know how long after ischemia the first changes in the intestinal wall began (Yu H, Kirkpatrick IDC, 2022).

Materials and Methods. Procedure was performed in accordance to EU Directive 2010/EU/63, approved by Food and Veterinary service of Latvia No. 120/2020. Ligation of superior mesenteric artery and vein was performed under inhalation anesthesia using Isoflurane mixed with 30% O₂, analgesia with Buprenorphine 0.3 mg/kg subcutaneously. Wistar Hannover male rats were divided into following groups: 15, 30, 60 min ischemia, sham (n = 7–10). Histological jejunum wall investigation was performed under light microscope using hematoxylin, eosin stain. Changes in the intestinal wall were evaluated according to Chiu's scheme (Sengul et al., 2013).

Results. 15 minutes: mucosal injury – from development of subepithelial (Gruenhagen's) spaces near the apex of villus to denuded villi with exposed lamina propria and dilated capillaries. 30 minutes: mucosal injury ranged from development of subepithelial (Gruenhagen's) spaces near the apex of villus, congestion in the capillaries to breaking into pieces of lamina propria with hemorrhage and ulceration. 60 minutes: jejunal wall mucosa injury ranged from intensive separation of epithelium to breaking into pieces of lamina propria with hemorrhage and ulceration. Sham group: intestinal mucosa was normal without signs of inflammation, hyperemia and hemorrhage.

Conclusions. The first changes induced by hypoxia were observed after 15 minutes of hypoxia confirming the intestinal villous epithelium sensitivity to hypoxia.

NOVEL STRUCTURAL VARIANT CHARACTERISATION AFTER GENOME SEQUENCING IN THE SH2D1A GENE

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Keywords. SH2D1A; Structural variant; Immunodeficiency

Introduction. SH2 domain containing 1A gene (SH2D1A) is located in Xq25 region. This gene encodes a protein that is involved in the bidirectional stimulation of T and B cells. Loss of function variants in this gene cause X-linked lymphoproliferative syndrome type 1. Most frequently there are described missense and nonsense variants, but structural variants have also been reported. X-linked lymphoproliferative syndrome type 1 is a primary immunodeficiency, that causes severe immune dysregulation, especially an exaggerated immune response to Epstein-Barr virus. The disease can be presented as severe mononucleosis and malignant lymphoma.

Case Description. 28 years old male with clinically confirmed primary immunodeficiency. With genome sequencing identified complex structural variant located on *SH2D1A* gene, but with unclear structure.

Summary. In order to clarify breakpoints Sanger sequencing was done with custom oligonucleotides identified with Primer3 software. Sequences were aligned to reference sequences NG_007464.1 and X chromosome (hg38). With PCR were amplified region chrX: 124349221–124343651, that was further sequenced with internal primers. One sequence was included to one till three breakpoints. Identified structural variant consists of two insertions deletions with following structure according to HGVS nomenclature – X:n.124343809_124346882ins124347116_124349110;n.124347110_124347111ins124346638_124346783. Borders of inserted variants +/- 2–4 nt as there is homology in nucleotides observed.

Conclusions. There is described novel structural variant covering SH2D1A gene's first exon that most likely is affecting gene expression. This study shows that even after genome sequence still Sanger sequencing should be used to clarify the exact structure for structural variants.

ANTIMICROBIAL PEPTIDES AND INTERLEUKINS IN CLEFT PALATE

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Keywords. Interleukin 10; Human beta defensins; Cathelicidin, cleft palate

Objectives. Cleft lip and palate remains one of the most common paediatric congenital anomalies with consequences on anatomical and physiological aspects, as well as on psychosocial functioning. The role of protective tissue factors in its pathophysiology is still debated, hence the goal of our study was to investigate the appearance and distribution of interleukins and antimicrobial peptides in cleft palate tissues.

Materials and Methods. Samples of soft palate were obtained from 8 children with cleft palate and/or lip – 3 girls and 5 boys aged 4 to 12 years. Additionally control samples were gathered from 2 male and 3 female subjects aged 40 to 60 years without any pathology of face and neck. Tissues were immunohistochemically stained for LL-37, IL-10, HBD-2, HBD-3, HBD-4 and CD-163 and slides were examined by light microscopy. For evaluation of statistical differences between patients and controls Mann-Whitney U test was performed. Spearman's rank correlation coefficient was used to detect correlations between studied factors.

Results. Statistically significant difference between patient and control soft palate epithelium and connective tissue was observed for IL-10 and HBD-2, yet HBD-4 showed the difference in connective tissue. Out of these factors, highest number of positive cells in epithelium was for IL-10 and in connective tissue all three factors – IL-10, HBD-2 and HBD-4 – showed moderate number of positive cells. LL-37 varied from mostly moderate to numerous positive cells in patient and control tissues. Spearman's rank correlation coefficient revealed multiple positive correlations between the factors in cleft affected tissues.

Conclusions. An increase of antimicrobial proteins HBD-2 and HBD-4 and anti-inflammatory cytokine IL-10 suggests the wide compensatory elevation of local immune system against the cleft-affected tissue changes. The observed correlations between the studied factors prove the mutual involvement of common local defense factors into the morphopathogenesis in postnatal cleft palate.

EXPRESSION OF MARKERS KI-67, NESTIN, VEGF, CD34 AND APOPTOSIS IN RELATIVELY HEALTHY LUNG TISSUE WITH NON-CHANGED AND METAPLASTIC BRONCHIAL EPITHELIUM

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Keywords. Ki-67; Apoptosis; Nestin; VEGF; CD34; Bronchial epithelium

Objectives. Knowledge about the occurrence of processes such as proliferation, apoptosis and angiogenesis in healthy lung tissues with different bronchial epitheliums is limited – further exploring can contribute to a better understanding of the physiological renewal of lung tissues. These processes occur with the help of important tissue factors, therefore, the aim of the study was to determine the expression of markers Ki-67, nestin, CD34, VEGF and detect apoptotic cells in relatively healthy lung tissue.

Materials and Methods. Samples of lung tissue were obtained from 19 patients and divided in groups of patients with non-changed and metaplastic bronchial epithelium. Routine histology examination was done. Marker-positive cells were detected by immunohistochemistry method. Apoptotic cells were detected by TUNEL assay. The number of positive structures was counted semiquantitatively by microscopy.

Results. Ki-67 positive cells were detected in one case. Occasional to moderate number of nestin-positive structures was found in various tissues of lungs with different bronchial epitheliums. No apoptotic cells were seen in non-changed bronchial epithelium, compared with few apoptotic cells in metaplastic epithelium. Metaplastic bronchial epithelium contained more VEGF positive cells than non-changed epithelium. Samples with non-changed and metaplastic bronchial epithelium both contained similar number of CD34 positive structures. Two moderate positive correlations were detected between factors.

Conclusions. Proliferation and apoptosis are not prominent events in normal lung tissue. Moderate number of nestin-positive cells in alveolar epithelium and cartilage of bronchi with pseudostratified ciliated epithelium suggests a significant role of neuronal origin cells in these structures, intensifying in metaplastic epithelium. Practically non-changed number of CD34 positive cells excludes any difference in stimulation of endothelial origin cells between lungs with different types of epithelium. An increase of VEGF in structures with metaplastic epithelium suggests the influence of tissue ischemia impact on possible development of metaplasia.

ULTRASONIC ACTION ON HUMAN BLOOD CIRCULATORY SYSTEM

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Keywords. Acoustic ultrasonic waves; Coagulation; Platelets

Objectives. Our study aimed to evaluate acoustic ultrasound action on the main structural components of the human blood circulatory system, especially coagulation.

Materials and Methods. We used a specially developed ultrasonic blood flow stimulation device based on a resonant vibration generation system combined with a piezoelectric buzzer transducer, an ultrasonic generator, and a controller. Anonymous blood samples were evaluated for general blood tests and coagulation representing thromboelastometry tests using standard 30W, 60W, and buzzer-type USB action. Computer modeling was performed using the COMSOL Multiphysics software package, and data analysis were by IBM SPSS 28 version.

Results. No statistically significant structural changes on general blood tests were found by using 30W and the buzzer USB application. Using 60W USB we found a decrease in red blood cells (RBC), haemoglobin (HGB), haematocrit (HCT) and an increase in mean corpuscular haemoglobin concentration (MCHC), red cell distribution width (RDW), platelets (PLT) expression. No significant changes were founded on EXTEM, INTEM, but increased coagulation time (CT) and amplitude 5min. after coagulation time CT(A5) on FIBTEM by using both 30W and 60W USB. Also, we observed a gradually increasing clot formation time (CFT) and maximum lysis (ML) expression with no changes in erythrocyte sedimentation rate (ESR), which could be clinically important. Looking at specific platelet functional status, we found increased activated partial thromboplastin clotting time (aPTT), full blood count (FbC), SPA/INR, and D-dimer expression. Since this is a pilot study, we performed two sets of trials, therefore the amount of data we obtained was not enough to draw concrete statistical results.

Conclusions. According to primary lab tests done, extracorporeal USB could successfully adjust disorders of the blood plasma coagulation system that occur due to insufficient activity of coagulation factors or their deficiency, identify other haemostasis disorders and evaluate the success of treatment.

PRESENCE OF NONCOMPACTION CARDIOMYOPATHY AND CONDUCTION DISTURBANCES AMONG PATIENTS AT PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL

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Keywords. Noncompaction cardiomyopathy; Cardiac Magnetic Resonance Imaging, Conduction Disturbances

Objectives. Given that noncompaction cardiomyopathy has recently been established as a diagnosis and is not classified as a cardiomyopathy according to the WHO, it is not fully understood how common this condition is in the population and is frequently missed or misdiagnosed. The aim of this study was to determine the incidence of noncompaction cardiomyopathy among patients at Pauls Stradins Clinical University Hospital and to assess the accompanying conduction disturbances in ECGs where such patient data was available.

Materials and Methods. Retrospective single-center study included adult patients who had cardiac MRI performed at Pauls Stradins Clinical University Hospital in the timespan from January 1, 2021, to October 1, 2022. In order to assess the compacted and noncompacted layers of the myocardium, syngo. CT Cardiac Function software was used. Mathematical data processing was performed using descriptive statistics.

Results. Out of 811 cardiac MRIs that were performed in the respective period of time, noncompaction cardiomyopathy was detected in 5.5% ($n = 45$) of the cases. 49% of the patients ($n = 22$) were women and 51% ($n = 23$) were men. Mean age of all patients was 53.89 years ($SD \pm 15.70$). In 71% ($n = 32$) of the cases, ECGs were available for assessment, 19% ($n = 6$) of which presented with atrial fibrillation, 34% ($n = 11$) with ventricular extrasystoles, 22% ($n = 7$) with left bundle branch block, 3% ($n = 1$) showed sinoatrial node block, and 3% ($n = 1$) nonspecific ST-T segment changes. In 19% of the ECGs there were no abnormal findings.

Conclusions. Noncompaction cardiomyopathy is a condition that should always be kept in mind in case of patients presenting with complex symptoms. While slightly, in our study it was more common in men. More than half of the patients presented with abnormal ECG findings, indicating that there is a relationship between conduction disturbances and the presence of noncompaction cardiomyopathy.

TRENDS OF COMPACTED VERSUS NONCOMPACTED MYOCARDIAL LAYER IN PATIENTS WITH NONCOMPACTION CARDIOMYOPATHY

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Keywords. Noncompaction cardiomyopathy; Cardiac Magnetic Resonance Imaging

Objectives. Deep interventricular recesses and hypertrophy ventricular trabeculations are the most notable manifestations of noncompaction cardiomyopathy. In this study we aimed to investigate whether there is a correlation between the length of the trabeculae at the apex and the ratio of layers in specific segments of the left ventricle.

Materials and Methods. Retrospective single-center study included adult patients who had cardiac MRI performed at Pauls Stradins Clinical University Hospital in the timespan from January 1, 2021, to October 1, 2022. In order to assess the compacted and noncompacted layers of the myocardium, syngo. CT Cardiac Function software was used. Mathematical data processing was performed using descriptive statistics.

Results. 811 cardiac MRIs were done during the specified time period. Out of these assorted cases, 45 were further opted for to include in the study as the radiological findings indicated suspected or definitive noncompaction cardiomyopathy. 49% of the patients ($n = 22$) were women and 51% ($n = 23$) were men. It was noted that there is a statistically significant correlation ($p = 0.030$, $p = 0.006$, and $p = 0.022$, respectively) between the length of the trabeculae at the apex of the heart and several segments of the left ventricle. As the length of the trabeculae increased, the ratio of layers in the noncompacted left ventricular segments 6 and 13 increased, while the ratio of layers in the segment 11 decreased as the length of the trabeculae grew in female patients. It was also concluded that no statistically significant relationships were found between the same variables in male patients.

Conclusions. If a prominent trabeculae is detected in female patients using cardiac imaging tools like ECHO, it can be a helpful indicator towards performing a more thorough investigation, such as cardiac MRI, to exclude noncompaction cardiomyopathy diagnosis.

RELATIONSHIP BETWEEN VENTRICULAR TRABECULATIONS AND LEFT VENTRICULAR EJECTION FRACTION IN PATIENTS WITH NONCOMPACTED CARDIOMYOPATHY

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Keywords. Noncompaction Cardiomyopathy; Left Ventricular Ejection Fraction

Objectives. Most clinically significant when manifesting as noncompaction cardiomyopathy, hypertrabeculation and noncompaction are congenital or acquired abnormalities of myocardial anatomy characterized by prominent trabeculations, intertrabecular recesses, and a thin outer epicardial compacted myocardial layer. In this study we aimed to investigate whether there is a correlation between the length of the trabeculation in the wall of the left ventricle and left ventricular ejection fraction (LV EF).

Materials and Methods. Retrospective single-center study included adult patients who had cardiac MRI performed at Pauls Stradins Clinical University Hospital in the timespan from January 1, 2021, to October 1, 2022. In order to assess the length of the trabeculations, syngo.CT Cardiac Function software was used. Mathematical data processing was performed using descriptive statistics (Spearman's rank correlation coefficient).

Results. 811 cardiac MRIs were done during the specified time period. Out of these assorted cases, 45 were further opted for to include in the study as the radiological findings indicated suspected or definitive noncompaction cardiomyopathy. 49% of the patients (n = 22) were women and 51% (n = 23) were men. There was a statistically significant negative correlation between LV EF and the length of the trabeculation in the wall of the left ventricle (p = 0.004). As the length of the trabeculae increased, LV EF became lower.

Conclusions. If patients present with decreased LV EF and there is no obvious cause such as aortic stenosis or heart failure, further investigations like cardiac MRI must be performed to exclude noncompaction cardiomyopathy as a possible cause for the reduced ejection fraction.

COVID-19 PANDEMIC INFLUENCE ON PERICARDITIS PATIENTS IN THE HOSPITAL OF LUHS KAUNAS CLINICS

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Keywords. COVID-19 disease; Pericarditis

Objectives. The COVID-19 pandemic changed everyday life and strongly affected the healthcare system. This study aims to compare and determine the differences in the course of pericarditis before and during the COVID-19 pandemic.

Materials and Methods. The retrospective study enrolled 45 patients that were treated at the Department of Cardiology due to pericarditis from 2018 to 2021. We analyzed patients' demographic findings, the origin of pericarditis, comorbidities, and treatment tactics. IBM SPSS Statistics 26.0 were used for data analysis. Differences between variables were assessed using chi-square(χ^2) criteria and Student's T-test. Results were statistically significant when $p < 0.05$.

Results. 21 patient was treated due to pericarditis before the COVID-19 pandemic, 24 during the pandemic. 23 males and 22 females were included in our study; the mean patient age was 64 years. Three of the analyzed patients had an anamnesis of COVID-19 infection. Mostly, the origin of pericarditis was neoplastic ($N = 19$, 42.2%) or idiopathic ($N = 14$, 31.1%). 60% of the patients had a body mass index (BMI) higher than 25 kg/m². Pre-pandemic, statistically more patients with pericarditis were overweight or obese than during the pandemic ($\chi^2 = 4.36$, $p < 0.05$). 73.3% of patients had arterial hypertension (AH). Patients with AH had a statistically significant higher mitral valve regurgitation rate ($\chi^2 = 4.03$, $p < 0.05$). During the pandemic, coronary angiography was not performed for patients with pericarditis, mostly based on internal hospital orders, meanwhile, pre-pandemic, this procedure was done on 38% of pericarditis patients ($\chi^2 = 11.12$, $p < 0.05$). Pericardial drainage was performed for 32 patients, pericardiectomy – for 2 patients, medicamentous treatment – for 11 patients. Treatment tactics was not statistically different in pre-pandemic and pandemic periods.

Conclusions. During the quarantine, the course of disease and treatment of hospitalized patients with pericarditis did not differ significantly from the pre-pandemic period. The pre-pandemic group of patients had a statistically significant higher BMI and a higher rate of coronary angiography performance.

STATIN THERAPY IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING HEMODIALYSIS

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Keywords. Hemodialysis; Statins

Objectives. Patients receiving hemodialysis present significantly higher risk for cardiovascular events and, furthermore, benefits of statins are controversial in these patients (Fellström et al., 2009). The aim of this study is to analyze data of statins use in patients from different Latvian hemodialysis centers.

Materials and Methods. A cross-sectional study included consecutive patients from four hemodialysis centers from June till October 2022. Data was analyzed with SPSS statistics.

Results. Among 113 included patients, 64.6% were man, mean age was 62.8 ± 14.9 years. Current smokers were 14.2%. Most common primary cause for hemodialysis (47.2%) was glomerular diseases. Comorbidities as primary arterial hypertension and diabetes were diagnosed in 39.8% and 17.7% of patients, respectively. History of arterial vascular disease was present in 47 (41.6%) patients, 26 (23%) patients underwent revascularization. Anamnesis of kidney transplantation was present in 17.7%. Mean plasma concentration for total cholesterol, LDL cholesterol and triglycerides were 4.4 ± 1.3 mmol/L, 2.5 ± 1.1 mmol/L and 1.7 ± 1.3 mmol/L, respectively. Statins were used in 60 (53.1%) patients, majority of them (68.3%) were using atorvastatin. Patients who had transplantation were associated with 2.4 times increased usage of statins ($p > 0.05$). No significant lipid concentration difference was observed between patients who underwent transplantation and those who did not. ($p > 0.05$). LDL concentration with and without statin use was 1.97 and 2.73 ($p = 0.03$), respectively. Patients with history of cardiovascular events had 8.4 times higher probability of using statins than patients without cardiovascular events ($p < 0.001$, CI 3.47–20.53) and 10.3 times higher probability of using statins after revascularization than patients without revascularization ($p < 0.001$, CI 2.98–37.11).

Conclusions. Statin therapy was related to history of cardiovascular events and revascularization, as well expressing significantly lower LDL concentration, that might be beneficial in secondary prophylaxis. History of transplantation was associated with increased statin administration.

ANTICOAGULANT REGIMEN IN ATRIAL FIBRILLATION PATIENTS WITH DETECTED ATRIAL THROMBI AND PRETHROMBI: SINGLE CENTER 6 YEAR EXPERIENCE

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Keywords. Transesophageal echocardiography; Anticoagulants

Objectives. Atrial fibrillation possesses a high risk of thromboembolism and stroke, therefore it is necessary to prescribe anticoagulation therapy for the prevention of such events. The objective of this study is to assess the Latvian Cardiology center experience prescribing regimens of anticoagulants in patients with thrombi and pre-thrombi detected by transesophageal echocardiography (TEE).

Materials and Methods. Patients were selected using TEE record books and the Doctor's Office information system in Pauls Stradiņš Clinical University Hospital. It was determined whether and what anticoagulants patients used before and after TEE. MS Excel and IBM SPSS were used for data analysis.

Results. A total of 72 patients was included in the study of which 50.7% (n = 36) had prethrombi in atria 49.3% (n = 35) did not use any anticoagulant, the mean CHA₂DS₂-VASc score was 3.52 and the mean follow-up time was 2 months of 39 patients. In 59.1% (n = 13) patients without anticoagulant therapy on follow-up had no thrombi or prethrombi after anticoagulant prescription p = 0.04. The most commonly prescribed anticoagulants were Rivaroxaban 20 mg 29.6% (n = 21), Warfarin 25.4% (n = 18), and Dabigatran 150 mg x 2 15.5% (n = 11). On follow-up, only 27.8% (n = 5) of patients with prescribed Warfarin had mechanical valve prosthesis p < 0.01. Also, only 40.9% (n = 9) of patients with prescribed Rivaroxaban 20 mg had no thrombi in atria on follow-up p = 0.54.

Conclusions. Thromboembolism prophylaxis is essential for patients with atrial fibrillation. As shown in 59.1% (n = 13) of patients who did not use any anticoagulants after their prescription thrombi and prethrombi were dissolved. The most commonly prescribed anticoagulants were Rivaroxaban, Warfarin, and Dabigatran.

RHYTHM DISTURBANCES IN PATIENTS DISCHARGED AFTER ACUTE MYOCARDIAL INFARCTION

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Keywords. Transesophageal echocardiography; Anticoagulants

Objectives. Studies have shown that most patients after myocardial infarction develop some form of arrhythmia. The aim of this study is to evaluate the incidence and types of heart rhythm disorders in discharged patients after acute myocardial infarction.

Materials and Methods. A total of 29 patients hospitalized with acute coronary syndrome with ST segment elevation after revascularization of the culprit vessel were enrolled. Upon discharge, an ECG monitoring device was affixed to the chest. The device recorded patients ECG during a week after the discharge. Patients' echocardiographic, laboratory, angiographic data were collected and correlation with rhythm disturbances were sought.

Results. Of the study population 83% were male and 17% female patients. Mean age in male patients was 55.67 years while in female patients it was 65.40 years. In study, population mean total cholesterol was 5.84 mmol/L, LDL 3.7 mmol/L and triglycerides 1.23 mmol/L. Mean CK-MB upon admission was 68.55 ng/mL, while troponins was 18555 ng/L. 7 patients developed non-sustained monomorphic ventricular tachycardia episodes. Atrial undulation was detected in one patient, a total of 13 episodes, of which longest was 45 minutes. Most common rhythm disturbance was ventricular premature beats with average 113 premature beats per day. Patients with lower ejection fraction had higher heart rate during the night ($r = -0.37$; $p = 0.048$). Higher maximum CK-MB correlated with higher average heart rate during the day ($r = 0.391$; $p = 0.036$) and lower during the night ($r = -0.457$; $p = 0.013$). BNP positively correlated with average ventricular ectopic beats per hour ($r = 0.366$; $p = 0.051$). Higher total cholesterol values had a positive correlation with the amount of atrial run episodes ($r = 0.373$; $p = 0.047$).

Conclusions. The study population were high cardiovascular-risk patients. The most common rhythm disorder in the patient population was ventricular premature beats. Patients with heart failure markers were at a higher risk of developing rhythm disturbances.

THE EFFECT OF PHYSICAL ACTIVITIES ON BLOOD PRESSURE: A CROSS-SECTIONAL STUDY AMONG COMPETITIVE-LEVEL MASTERS BASKETBALL PLAYERS

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Keywords. Athletes; Blood Pressure; Physical activity

Objectives. Current European and American hypertension guidelines recommend regular physical activity, but, commonly, physical activities are not first-line choice by patients in reducing blood pressure (BP), as they may be concerned about the opposite effect. Even high normal BP (systolic BP (SBP) 130–139 mmHg and/or diastolic BP (DBP) 85–89 mmHg) is considered to influence the risk of adverse cardiovascular events, but several studies have reported a decrease in SBP and DBP blood pressure after physical activity.

Materials and Methods. A cross-sectional study was conducted as part of a project related to identifying risk factors for life-threatening clinical events in athletes at the master level. The study included 45 men's basketball masters players from different regions of Latvia from May to December 2022 who consented to participate in the study. All athletes were asked to complete the questionnaire, and body measurements were taken. Electrocardiogram (ECG) recordings and blood pressure measurements were registered before, during and after exercise (60 minutes of basketball training). Data were analyzed with IBM SPSS 28.0.1.1.

Results. The mean age was 66.96 years (SD = 8.03) (range 49–85 years), and the mean body mass index (BMI) was 26.88 kg/m². The average SBP and DBP at rest and after exercise show a reduction in post-workout recordings (146.69 mmHg (SD = 11.72) and 98.20 mmHg (SD = 11.43); 145.00 mmHg (SD = 12.93) and 91.76 mmHg (SD = 11.08), respectively). Players with elevated SBP > 140 mmHg (N = 31) and DBP > 90 mmHg (N = 36) had an even more significant reduction (152.2 mmHg (SD = 9.59) and 102.61 mmHg (SD = 7.18); 147.26 mmHg (SD = 12.86) and 93.83 mmHg (SD = 10.54), respectively. There is a statistically significant reduction in DBP ($t = 3.47$, $p = 0.01$), but not in SBP ($t = 0.76$, $p = 0.450$), but a closer correlation for players with elevated SBP ($t = 1.88$, $p = 0.70$) and DBP ($t = 4.80$, $p < 0.01$).

Conclusions. Aerobic exercises have a blood pressure lowering effect both for systolic and diastolic blood pressure, contributing a statistically significant difference for DBP for all players ($p = 0.01$) and specifically for patients with elevated BP already before exercise ($p < 0.01$).

ASSOCIATION OF CLINICALLY SIGNIFICANT SYSTEMIC INFLAMMATION WITH LIVER CIRRHOSIS PROGRESSION IN THE RIGA EAST UNIVERSITY HOSPITAL PATIENT POPULATION WITH CHRONIC HEPATITIS B OR C VIRUS INFECTION

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Keywords. Liver cirrhosis; Inflammation; Hepatitis B Virus; Hepatitis C virus

Objectives. Systemic inflammation has garnered interest as a pathophysiologic mechanism of liver cirrhosis. The aim was to explore the relationship between systemic inflammation and cirrhosis progression in a population with chronic infection of Hepatitis B Virus (HBV) or Hepatitis C virus (HCV), using a widely available marker – C reactive protein (CRP).

Materials and Methods. A retrospective cross-sectional study analyzed 164 hospitalization records from Riga East University Hospital with ICD-10 code pairings B18.2+K74, or B18.1+K74, excluding other diffuse liver pathologies. Data spanning 2016–2021 were processed with Microsoft® Excel v16.68, and IBM® SPSS® Statistics v28.0.1.0.

Logistic regression model was created with alpha 0.05. CRP, the dependent variable, with a cut-off value ≥ 10 mg/L represented clinically significant inflammation. Independent variables were Child-Pugh class A/B/C (CP-A/CP-B/ CP-C); acute infections at hospitalization. Adjusted odds ratios (aOR) were calculated, controlling for age and sex.

Results. Sample mean age was 58.6, 95% CI [56.9, 60.3]; 54.9% (N = 90) were males; 71.3% (N = 117) had chronic HCV; 24.4% (N = 40) had acute infections. Patients represented CP classes accordingly: CP-A 20.1% (N = 33); CP-B 54.3 (89%); CP-C 25.0% (N = 41), with one case missing data. Median CRP was 9.75 mg/L (IQR = 22.45); ≥ 10 mg/L group had 47.6% (N = 78) patients; < 10 mg/L had 52.1% (N = 85). Compared to CP-A, only CP-C had a strong significant positive association with inflammation: aOR 5.84 (95% CI [1.88, 18.12], $p = 0.002$). Acute infections had a positive association: aOR 2.54 (95% CI [1.14, 5.67], $p = 0.023$). HCV, compared to HBV, showed a negative association: aOR 0.173 (95% CI [0.075, 0.399], $p < 0.001$).

Conclusions. A positive association between CP-C and CRP levels ≥ 10 mg/mL was found, not wholly explained by acute infections or chronic HCV/HBV, having positive and negative associations, respectively. CP-C had 5.84 times greater odds than CP-A for clinically significant inflammation, signifying the role of systemic inflammation in the deterioration of liver cirrhosis.

INFECTIOUS COMPLICATIONS OF PERCUTANEOUS TRANSHEPATIC CHOLANGIOGRAPHY: ONE CENTRE RETROSPECTIVE RESEARCH

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Keywords. Infectious complications; Percutaneous transhepatic cholangiography

Objectives. The aim is to evaluate percutaneous transhepatic cholangiography (PTC) caused infectious complication rates and risk factors for complications at Pauls Stradiņš Clinical University Hospital.

Materials and Methods. A retrospective analysis of 63 patients who underwent a PTC at Pauls Stradiņš Clinical University Hospital from January 2019 to September 2022. Data from medical histories was gathered in this study about indications for PTC, number of PTC procedures undergone, what kind of stent was inserted, whether antibiotics had been given prior to PTC, results of blood tests and cultures, antibiotic sensitivity and post-PTC complications.

Results. From 63 study patients who had a PTC procedure 55 patients (median age 67.5 years, 40% were women) were included in this study, and 8 patients were excluded due to lack of data. PTC-related complications were developed by 25 (45.5%) patients, infectious complications by 43.6%. 33.2% of patients developed cholangitis, 12.7% pancreatitis, 13.9% sepsis and 1.8% an abscess. Out of 32 patients without a pre-existent infection 24 (75%) developed at least one infectious complication. Only one patient developed a non-infectious complication – post-PTC bleeding. 30-day mortality was 7.3%. Risk factors for infectious complications were found to be drain obstruction and repeated (PTC) interventions. Complication rate has been lowered by 33.7% with the administration of antibiotic prophylaxis, although only in 45% cases patients received it after local guidelines had been implemented.

Conclusions. Incidence of infectious complications after PTC procedure was found to be higher than expected – 43.6% of patients developed drainage-related complications after PTC, mainly cholangitis, pancreatitis and sepsis. This study reports higher than the threshold complication rates after PTC that are stated in recent SIR guidelines. Antibiotic prophylaxis before PTC significantly reduced complication rates even with moderate adherence of doctors to the guidelines.

COVID-19 IMPACT ON TOTAL CHOLESTEROL LEVELS IN THE BLOODSTREAM ON PRACTICALLY HEALTHY INDIVIDUALS

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Keywords. COVID-19 infection; Total cholesterol

Objectives. The problem is of outstanding importance since the year of 2019 when the COVID-19 infection became a big health problem all over the world. Since then there have been many researches on total cholesterol level changes in the bloodstream, but most of the research excluded practically healthy individuals. The virus has an impact on all the organ systems, mostly affecting respiratory and gastrointestinal systems. The aim of the study was to understand if there's a correlation between red meat consumption during the disease and increased total cholesterol levels after the disease.

Materials and Methods. 50 patients were enrolled in the retrospective study from October 2022 till January 2023. The study population were individuals over 18 years old and without any chronic illnesses. All the participants signed consent. The laboratory test data were taken from ambulatory cards in the family doctor practice. Patients filled a questionnaire of 11 questions about their lifestyle during the illness. Patients were divided in 2 groups – the first group consumed red meat and the second group avoided red meat during disease. The study was approved by the ethics committee.

Results. Both groups consisted of 60% females (n = 15) and 40% of males (n = 10). In the first group, the average total cholesterol before the disease was 5.52 mmol/L and after the disease was 5.85 mmol/L (increased for 0.34 mmol/L). In the second group, the average total cholesterol before the disease was 5.2 mmol/L and after the disease was 4.83 mmol/L (decreased for 0.37 mmol/L). P(T < = t) one-tail in both cases is significantly higher than the threshold value (p = 0.05), which means a statistically significant association is found between red meat consumption and increased total cholesterol after the disease.

Conclusions. A statistically significant relationship was found between red meat consumption during the disease and increased total cholesterol after recovering from COVID-19.

CAPILLAROSCOPY AS AN EARLY INFORMATIVE METHOD OF DIAGNOSING THE STATE OF THE MICROVASCULATURE IN PATIENTS WITH DIABETES MELLITUS

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Keywords. capillaries, diabetes mellitus, capillaroscopy, microcirculation

Objectives. Aim: to study the condition of capillaries in patients with diabetes mellitus and compare it with the pattern in patients without diabetes.

Materials and Methods. A clinical examination of 37 patients with type 2 diabetes mellitus was carried out. The Dino-Lite MEDL4N5 Pro capillaroscope (Netherlands) was used as a method of examining the state of capillaries, and a capillaroscopic pattern of the periungual roller.

Results. When evaluating the capillaroscopic pattern, attention was paid to the number, shape, location of vascular loops, the pronouncedness of the subcapillary venous background, and the nature of the blood flow.

In healthy patients, the pattern of capillaries was quite constant, the capillaries had the appearance of elongated light-red loops arranged in regular rows. The number of capillaries varied between 8–12 in 1 linear mm. Their blood flow was homogenous.

Both quantitative and qualitative changes in skin microcirculation were noted in the capillaroscopic pattern of patients with diabetes mellitus. Various changes in the size and shape of capillary loops were recorded. Background color was changed. Structural changes of the capillaries were especially prominent with clinically pronounced symptoms of neuropathy. Capillaroscopic examination made it possible to observe a decrease in the number of capillaries to varying degrees, up to the formation of so-called “vessel-free fields”.

Conclusions. The capillaroscopy technique provides a physician with more additional clinical and physiological information, which allows to evaluate the state of the entire microcirculatory bed and understand possible changes in the capillaries in patients with diabetes mellitus at different stages of the disease.

UNIVARIATE ANALYSIS OF DIETARY FACTORS ASSOCIATED WITH LOWER SEROLOGIC GASTRIC MUCOSA ATROPHY RATES

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Keywords. Diet; Gastric cancer; Serological atrophy; Pepsinogen

Objectives. Gastric mucosal atrophy (GMA) carries an increased risk of developing gastric cancer. Quitting smoking, reducing salt consumption, and eradicating H.Pylori reduce the risk, but other modifiable factors such as dietary components have been understudied. Serum pepsinogen is a good and reliable method for the indirect assessment of GMA. The aim of the study was to identify different dietary factors associated with decreased serological gastric atrophy (SGA) rates indicative of gastric precancerous lesions.

Materials and Methods. The study was performed within the framework of GISTAR study– a multicenter randomized population study (2019–2021) in Latvia. Participants aged 40 to 64 conducted a dietary survey based on memory recall. Each food item in the survey was defined as the frequency of consumption from “never”, “once a week” and up to “multiple times a day”. Additionally, blood samples were taken to obtain data on serum pepsinogen (Eiken Pg I, II, and Eiken Pg I/II ratio) to assess serological gastric mucosa status. Data were analyzed using IBM SPSS22 with Pearson correlation.

Results. Out of 907 adults (mean age 53.72 (SD 6.66), 69% Female) who conducted a diet survey and provided data on serological pepsinogen measurements, 8.5% (N = 60) had SGA. Pepsinogen values were higher in those who ate more buckwheat ($p = 0.005$). Pepsinogen I/II ratio was higher in those who ate more Nordic fruits like apples, pears, and plums ($p = 0.018$); garlic, onions, and leeks ($p = 0.041$); fruits and berries ($p = 0.048$). Eating meat and meat products was associated with lower pepsinogen values ($p = 0.004$), indicative of higher atrophy rates.

Conclusions. Several dietary factors were associated with lower SGA rates, identifying products potentially protective against the development of gastric precancerous lesions. However, to analyze independent associations between studied products and serological atrophy, a multivariate analysis should be performed.

OUTCOMES OF AB0 BLOOD GROUP COMPATIBLE AND INCOMPATIBLE LIVING DONOR KIDNEY TRANSPLANTATIONS

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Keywords. Living donor kidney transplantation, AB0 incompatible, graft function, graft/patient survival

Objectives. Kidney transplantation is a method that ensures the best survival and quality of life for recipients. Thanks to modern medical advances, AB0 incompatibility is no longer a contraindication for transplantation but an applied practice with good outcomes.

The aim of the study is to summarise and analyse the results of kidney transplantation from AB0-incompatible (AB0i) living kidney donors and compare them with demographic parameters in AB0-compatible (AB0c) kidney transplants.

Materials and Methods. Retrospective case–control study (1:2) comparing AB0i vs. AB0c living donor kidney transplantations from 2012 to 2020 in Pauls Stradins Clinical University Hospital. A total of 33 patients were included and followed up for three years.

Results. 11 AB0i recipients (age 28 ± 8 ; 73% male) and their donors (age 52 ± 11 ; 27% male) matched to 22 AB0c recipients (age 32 ± 9 ; 77% male) and their donors (age 59 ± 9 ; 31% male).

The 1-year patient survival in both groups was 100%. The 3-year patient survival rate was: in AB0i 90.9% (1 patient died due to flu), AB0c 95.5% (1 patient died due to trauma) group.

The 1-year graft survival was 90.9% in AB0i and 100% in AB0c group. The 3-year graft survival was 81.8% in AB0i and 90.9% in AB0c group.

In both groups, four patients experienced an antibody mediated rejection – in the early post-transplant period: one in AB0i group vs. four in AB0c group, although in the late post-transplant period, three in AB0i vs. none in AB0c. There were good outcomes in graft function in both AB0i and AB0c groups, with an eGFR (mL/min/1.73m²) of 70.5 vs. 70.0 at one year after transplantation ($p = 0.23$) and 75.5 vs. 59.5 at three years ($p = 0.18$).

Conclusions. AB0 incompatible living donor kidney transplantation is non-inferior to AB0 compatible. There is not a statistically significant difference in outcomes between AB0i and AB0c.

ANXIETY LEVELS IN RELATION TO GLYCAEMIC CONTROL IN PATIENTS WITH TYPE 1 AND TYPE 2 DIABETES MELLITUS

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Keywords. Diabetes mellitus; Anxiety; Glycaemic control

Objectives. Overall, there are 422 million people in the world living with diabetes. According to statistics reports in 2021 there were 5515 patients with type 1 diabetes and 88933 patients with type 2 diabetes living in Latvia. Since 2011 these numbers have increased by 1454 and 18479, respectively. It has been proven that mental health is worsened by the presence of chronic illness, and that it affects one's ability to control their disease.

The aim of this study was to determine whether there are correlations between glycaemic control and levels of anxiety.

Materials and Methods. This cross-sectional study included adults aged 18 and older with the diagnosis of diabetes presenting in a clinic or whilst being hospitalized. The evaluation of mental health status was done by a self-report questionnaire. GAD-7 score was used to determine anxiety levels. Glycaemic control was estimated by the last reported glycated hemoglobin (HbA1c) level. Descriptive data analysis and Spearman's rank correlation were used to interpret the data.

Results. The participants of this study were 21 women (50%) and 21 men (50%) with the mean age of 58.39 years (± 17.75). 78.6% had type 2 and 19% had type 1 diabetes. The average duration of diabetes was 10.63 years (± 8.43). Mean HbA1c was 7.90% (± 2.34) and mean score of GAD-7 was 4.23 (± 4.05). A statistically significant moderately strong and positive correlation was found between HbA1c and GAD-7 score ($n = 39$; $p = 0.001$; $r = 0.502$).

Conclusions. A higher glycated hemoglobin level was associated with a higher level of anxiety. This indicates that poor glycaemic control may cause more distress in diabetes patients or that anxiety may inhibit an individual's ability to control their disease, or both. Further research with a larger sample size should be done to better evaluate this relationship.

CORONARY ARTERY DISEASE EVALUATION OF THE POTENTIAL KIDNEY TRANSPLANT RECIPIENT BEFORE RENAL TRANSPLANTATION

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Keywords. Kidney transplantation; Cardiovascular evaluation; Coronary artery disease

Objectives. History and physical examination, psychosocial assessment, laboratory and imaging tests are crucial components of end-stage renal disease patients' pre-transplant evaluation; it determines perioperative risk, optimizes patient selection and outcomes. The most common kidney transplantation reason for non-inclusion is cardiovascular disease, which is a leading cause of mortality among kidney transplant recipients. The study's primary objective was to analyze cardiovascular evaluation (EHO-KG, exercise-ECG, coronarography) results in dialysis patients population referred for pre-transplant evaluation at Pauls Stradins Clinical University Hospital.

Materials and Methods. A retrospective analysis of 84 kidney transplant recipient files at Pauls Stradins Clinical University hospital was done. We collected: demographic data, dialysis modality, end-stage renal disease duration (months), ultrafiltration (< 1.5 L, > 1.5 L), previous kidney transplantation, EHO-KG data (myocardial hypertrophy, reduced ejection fraction), exercise – ECG result as well as recommendations for further examination (CT or conventional coronary angiography). Data were analyzed using IBM SPSS 27.0 software by descriptive and conclusive statistical methods.

Results. Out of 84 patients included in the study, exercise-ECG was considered informative in 35.7% (n = 30) and uninformative in 64.3% (n = 54) cases. A statistically significant association was observed between the uninformative stress test and reduced left ventricular ejection fraction (< 50%) on EHO-KG (2%/25.9%; p = 0.031). Recommendations for further coronary artery investigation did not significantly differ between both groups: conventional coronarography were recommended 33.3%/44.4% (p = 0.320), CT coronary angiography 16.7%/20.4% (p = 0.479).

Conclusions. Exercise-ECG is the first stress test used for coronary heart disease screening in Latvia for end-stage kidney disease patients' prior to kidney transplantation; however, more than half of the results were declared uninformative by the operator due to limited patients' physical ability. Exercise-ECG results did not significantly influence the recommendation for additional cardiovascular tests such as CT or conventional coronary angiography.

THE MOST COMMON TYPES OF LACTOSE INTOLERANCE IN OUTPATIENT PRACTICE AMONG ADULT POPULATION

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Keywords. Lactose, intolerance, type

Objectives. Lactose intolerance is a clinical syndrome that manifests with characteristic signs and symptoms upon consuming food substances containing lactose, a disaccharide. The aim of this study is to determine the most common types of lactose intolerance in one outpatient practice among the adult population.

Materials and Methods. In this cross – sectional study, outpatient adult patients were given a self – administered questionnaire to collect primary data. Secondary data was collected and summarized from participant’s medical records. Statistical analysis was made using chi-squared and Shapiro – Wilk tests.

Results. Out of 77 adult respondents of which 64% (N: 49) were female and 36% (N: 28) male with a mean age of 37 ± 9.4 years secondary lactose intolerance was found to be the most common type of lactose intolerance (75%). This was followed by primary lactose intolerance, or genetically inherited condition (25%). The most common cause of lactose intolerance was dysbiosis (71%) followed by LCT 2q21 gene (25%), infection (3%) and surgery (1%). The most common symptoms in patients during the lactose intolerance breath test were increased peristalsis (22%), abdominal growling (14%) and belching (13%). Participants with positive lactose intolerance test had a concomitant GERD (69%), SIBO and IBS (61%). Statistically significant difference was found in abdominal pain between genders – 47% (N: 23) of women experienced abdominal pain due to lactose intolerance every day while in men it was 71% (N: 20), $p = 0.037$.

Conclusions. The most common type of lactose intolerance was secondary lactose intolerance caused by dysbiosis. This type was more commonly observed in the female population. Most of the patients in this study were diagnosed with concomitant GERD disease.

PRIMARY EFFUSION LYMPHOMA PRESENTING AS DYSPNOEA AND CHRONIC CARDIAC TAMPONADE: A CASE REPORT

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Keywords. Primary effusion lymphoma; Heart failure

Introduction. Primary effusion lymphoma (PEL) is a rare disease that usually presents as effusion in pleural, peritoneal, and pericardial spaces. It is frequently found in patients positive for HIV, or immunodeficient due to other causes.

Case Description. A 75-year-old woman with a history of arterial hypertension, chronic atrial fibrillation and type 2 diabetes was treated in a regional hospital for acute pneumonia and heart failure. Due to progressive dyspnoea, echocardiography was performed and 19 mm of pericardial fluid (PF) was found. The patient was hospitalised to the Cardiology Department of the Hospital of Lithuanian University of Health Sciences Kauno klinikos. Chronic cardiac tamponade was suspected, 1.4 litres of bloody PF was obtained by pericardiocentesis. PF cytology did not show neoplastic cells. Pulmonary hypertension was observed during echocardiography, but pulmonary embolism was rejected by chest CT. Because of progressing dyspnoea, hydrothorax and hypotension, the patient was admitted to the ICU where more than 4 litres of pleural fluid was obtained by pleurocentesis. After three days, dyspnoea decreased and the patient was transferred back to the Cardiology Department. Thoracic, abdominal and pelvic CT showed decreased hydrothorax and no other significant pathologies. Pleural fluid cytology did not show neoplastic cells, analysis with the cell block technique revealed large B-cell lymphoma. A repeated echocardiography showed normal left ventricle function and no pericardial effusion. Later the patient was transferred to the Haematology Department for further treatment.

Summary. A 75-year-old woman was hospitalised due to acute pneumonia and heart failure. Pericardial and pleural effusion was diagnosed and after rejecting other typical causes, pleural fluid analysis showed large B-cell lymphoma.

Conclusions. Pericardial effusion is usually associated with viral infection and mostly affects men ages 20 to 50 years. It is important to consider rare and oncological diseases in case of pericardial and pleural effusion with unknown aetiology.

CASE REPORT: ECMO SUPPORT AS A BRIDGE TO SURGICAL REPAIR OF POST-MYOCARDIAL INFARCTION VENTRICULAR SEPTAL RUPTURE

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Keywords. Myocardial infarction; Cardiogenic shock; Mechanical circulatory support; Ventricular septal rupture; ECMO; IABP

Introduction. Ventricular septal rupture (VSR) is a rare complication of acute myocardial infarction (AMI) with low 30-day- survival rate without intervention. Delaying operation until > 3–4 weeks gradually decreases mortality. Patients may benefit from mechanical circulatory support (MCS) to restore tissue perfusion and to prevent or reverse end-organ dysfunction, while providing enough time for the myocardium to scar and regain the consistency necessary for a successful surgery.

Case Description. A 52-year-old male patient admitted to CICU by EMS: anterior AMI (~8 days ago) complication– VSR (3cm left-to- right shunt) and cardiogenic shock, pulmonary edema. Preoperative, intraoperative period: Initial desaturation (SpO₂ – 83%, hypoxia PaO₂ – 62 mmHg, hypercapnia PaCO₂ – 60 mmHg) on NIV mask; urgently initiated sedoanalgesia and mechanical lung ventilation (MLV) with intubation cannula. Due to ineffective support with inotropes and vasopressors (support until 18th intrahospital day (IHD)) added MCS with intra-aortic balloon pump (IABP). Examination revealed cold, dry skin, bilaterally impaired leg perfusion. Hepatorenal syndrome indicated continuous renal replacement therapy (CRRT) (until 3rd IHD). 2nd IHD: MCS with peripheral femo-femoral venoarterial extracorporeal membrane oxygenation (VA-ECMO) (2.0 L/min, 5000RPM, FiO₂ – 0.7, sweep gasses flow – 2 L/min). 21st IHD: VSR surgical closure under general anesthesia with cardiopulmonary bypass, left-ventricle aneurysm resection; VA-ECMO weaning and explantation (20 days-on-support (DOS)). Blood pressure 80/60 mmHg (initially) 110/70 mmHg (catecholamines, MCS) 102/65 mmHg (postoperatively). Postoperative LVEF – 65%, preoperative LVEF – 50%. Postoperative period: 1st POD: MLV switched to tracheostomy tube; ended on 16th POD (37 DOS). 2nd POD: IABP removal (23 DOS). CRRT 2nd–5th POD (4 DOS). 6th POD: bilateral below-the-knee amputation due to ischemic complications; early rehabilitation, pressure ulcer therapy. 41th IHD: discharged from CICU.

Summary. Patient with cardiogenic shock due to post-AMI VSR, who successfully received 20 days long MCS by VA-ECMO as a bridge to cardiac surgical repair.

Conclusions. VA-ECMO can be successfully used as a MCS in post-AMI VSR patients as a bridge to surgery.

IMPLANTATION OF A LEFT VENTRICULAR ASSIST DEVICE IN END-STAGE HEART FAILURE AFTER VENTRICULAR ARRHYTHMIAS AND PULMONARY EMBOLISM: A CASE REPORT

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Keywords. ESHF; LVAD

Introduction. If a patient has end-stage heart failure (ESHF) it means they are at high risk of dying in the next 12 months. Mechanical circulatory support with a left ventricular assist device (LVAD) may be a valuable treatment in ESHF for an extended period of time.

Case Description. 5 years ago, 27-year-old man was diagnosed with dilated cardiomyopathy (DCM) and HF (NYHA class II) with significant left ventricular systolic dysfunction. Genetic variants that can cause dilated cardiomyopathy have not been identified. In 2022, after a COVID-19 infection, episodes of tachycardia with wide QRS complexes were observed by ECG telemonitoring, and an implantable cardioverter-defibrillator (ICD) was implanted. One week later ventricular fibrillation started, and ICD was ineffective. The patient underwent external defibrillation and was transferred to the cardiac intensive care unit for further treatment. Levosimendan was administered 4 times. Due to persistently elevated inflammatory markers in the background of antibiotics, chest computed tomography was performed and revealed pulmonary embolism (PE) of segmental and subsegmental branches and multiple pulmonary infarcts. After anticoagulant treatment, an invasive haemodynamic study revealed post-capillary pulmonary hypertension, increased pulmonary arterial resistance (Wood) of 4, and decreased minute heart volume. After 69 days of hospitalisation, LVAD – HeartMate 3 was implanted.

Summary. A 27-year-old patient with a known history of DCM was hospitalised for HF exacerbation and episodes of ventricular tachycardia. ICD was implanted. Ventricular fibrillation, resuscitation and PE complicated patients' condition during hospitalisation. LVAD was implanted. After LVAD implantation, patient's condition improved significantly. On echocardiography left ventricle ejection fraction was 23% (from 15%).

Conclusions. When standard therapy for HF is ineffective a heart transplant is considered in ESHF. Shortage of donor organs have led to the use of mechanical circulatory support with LVAD as a destination therapy. LVAD placement improves the prognosis, functional status, and quality of life of ESHF patient.

CARDIOVASCULAR EFFECTS OF A HALLUCINOGENIC AGENT (PSILOCYBIN) – PRESENTATION OF A CLINICAL CASE

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Keywords. Psilocybin; Ventricular fibrillation

Introduction. Psilocybin is the active ingredient in hallucinogenic mushrooms. Mushroom poisoning has various manifestations such as tachycardia, hypertension, hyperreflexia, prolongation of the QT interval, arrhythmias, particularly in people with risk factors. We aim to assess possible cardiovascular effects of psilocybin.

Case Description. A 32-year-old patient lost consciousness in her home, initial resuscitation was performed, and ambulance was called. Ventricular fibrillation (VF) was detected, and defibrillation was performed two times to restore spontaneous blood flow. In the Cardiac Intensive Care Unit (CICU) blood tests showed hypokalaemia, hypomagnesaemia, ~4 times increased parenchymal liver enzymes, D-Dimers – 1.33, TnI – 0.02. ECG and coronary angiography showed no abnormalities. It is known that patient underwent radiofrequency ablation for atrioventricular nodal re-entry tachycardia in year 2008 and 2014 and has consumed unspecified hallucinogenic mushrooms 1 day ago. After patient regained consciousness and was extubated, signs of postanoxic encephalopathy remained. Cerebral CT showed moderate cerebral oedematous lesions. Episodes of torsades de pointes (TDP) and VF were observed on days 2 and 3. Cardiac echocardiography showed a prolapse of the posterior leaflet of the mitral valve with slight leakage. A urine drug test was negative. Arrhythmias observed on days 2 and 3 could have been caused by psilocybin, but in the absence of confirmatory data, a single-chamber implantable cardioverter defibrillator (ICD) was implanted for secondary prevention of sudden death.

Summary. A woman was hospitalised after clinical death and restoration of spontaneous circulation. Several more episodes of TDP and VF were observed in the hospital. The patient was found to have ingested hallucinogenic mushrooms, but association between psilocybin and rhythm disturbances was not confirmed. Single-chamber ICD was implanted.

Conclusions. Psilocybin may provoke ventricular arrhythmias in predisposing conditions, such as congenital or acquired abnormalities of the heart's conduction system (e.g., long QT interval) and electrolyte imbalances.

AMYOTROPHIC LATERAL SCLEROSIS DUE TO FUS GENE MUTATION IN A PREGNANT WOMAN AND HER COUSIN: CASE REPORT

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Keywords. Amyotrophic lateral sclerosis; Bulbar signs; FUS gene mutation

Introduction. Amyotrophic lateral sclerosis (ALS) is a vigorously progressing, currently incurable neurodegenerative disease that affects primarily upper and lower motor neurons. Most of the cases are sporadic, and only 10% are familial. Up to 70 percent of familial and 10 percent of sporadic cases are thought to be monogenic. Yet causative genetic variants have reduced penetrance and intrafamilial variability.

Case Description. A 28-years old pregnant woman began to feel mildly impaired speech and swallowing. Her symptoms progressed over time. She gave birth to a healthy baby. Postpartum, her neurologic examination showed atrophy of the arm muscles and fibrillations in the tongue. Nerve conduction studies (NCS) determined the signs of active and chronic denervation of proximal limb muscle. During the two-month period, the disease progressed very fast and a repeated NCS showed an unfavorable disease progression. Exome sequencing was performed, *FUS* gene heterozygous likely pathogenic NM_004960.4:c.1566G > C variant was found as causative for ALS. The patient required palliative care months after the diagnosis was made till fatal outcome. In the same year, the patient's 32-year-old female cousin was consulted due to similar symptoms, and she has been diagnosed with ALS. The same *FUS* gene variant was found. Her condition worsened in a few months; palliative care is required.

Summary. Two cousins were presented for bulbar weakness and limb weakness. Genetic testing revealed the same pathologic *FUS* gene. This was causative for familial ALS with rapid progression.

Conclusions. The *FUS* gene can cause an early presentation familial ALS with variable expressivity – symptoms of predominant bulbar or limb weakness. A question arises whether pregnancy could have potentially accelerated the progression of the disease because there are no studies proving or describing the connection between those factors.

TRIPLE MYOTONIC DYSTROPHY DIAGNOSIS – PREGNANT WOMAN, HER FATHER AND HER FETUS: A FAMILIAL CASE REPORT

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Keywords. Myotonic dystrophy type 1; Congenital myotonic dystrophy

Introduction. Myotonic dystrophy type 1 (DM1) is one of the most prevalent deadly rare monogenic neuromuscular disorders. This disease has an autosomal dominant inheritance with CTG repeat expansion of the DMPK gene. DM1 has genetic anticipation. There are currently 3 types of DM1. Mild DM1 presents with mild symptoms usually not affecting the lifespan. Classic DM1 causes disability and more serious symptoms and affects lifespan. Congenital DM1 may present with reduced fetal movement, polyhydramnios, borderline ventriculomegaly, and talipes equinovarus and usually results in postnatal death or future disability.

Case Description. A 38-year-old woman was admitted to the hospital due to changes in the ultrasound during the 3rd trimester – fetal hypotonia and polyhydramnios. She was impregnated using IVF. The patient's clinical findings and ENMG conduction studies were consistent with DM1. Over 150 CTG repeats were discovered in the patient's DNA which was compatible with the classic type of DM1. The amniocentesis was done, and DMPK gene test result revealed congenital DM1 diagnosis for the male fetus. The Caesarian section was performed, and the newborn was evaluated to have 3 points on the Apgar scale. As of now it requires palliative care. Patient's 64-year-old father was diagnosed with the mild DM1 a few months later.

Summary. This familial case report describes DM1 presentation in three generations: the newborn had a severe case of congenital DM1, his mother had a classic DM1, while his grandfather was diagnosed with a mild DM1 type. All three of them had three different types of DM1 presenting with different symptoms and disease severity.

Conclusions. DM1 can present in different age groups with a vast variety of symptoms. As DM1 has genetic anticipation, it is significant to remember that the same family members can have different clinical manifestations and it is important for genetic counselling.

A HIDDEN ARMORED HEART: A CASE REPORT

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Keywords. Calcification; Myocarditis

Introduction. Intra myocardial calcifications, although rare, are associated with significant morbidity. They can be of dystrophic origin, local sequelae of tissue damage following myocardial necrosis, trauma, inflammation, or infection. They can also be metastatic related to a disturbance of phosphocalcic metabolism. Finally, calcifications may be idiopathic, with a poor prognosis if massive and extensive.

Case Description. A 36-year-old man with no medical or surgical history apart from a COVID-19 infection one month ago was brought to the emergency department for neurological distress. A cerebral MRI showed multiple recent lacunar ischemic strokes, suggesting an embolic cause. Apart from an altered consciousness, the clinical exam was normal. ECG showed normal sinus rhythm with a discrete ST-segment elevation in inferior leads. A transthoracic echocardiogram showed moderate left ventricular dysfunction with an ejection fraction of 45% secondary to severe wall motion abnormalities in the inferior and inferolateral walls. The myocardium in that region contained extensive calcification. No intracardiac thrombus and no shunts were found. A coronary angiogram showed no evidence of obstructive coronary artery disease. Cardiac MRI and CT showed significant calcifications starting in the pericardium, infiltrating the inferior wall, and late gadolinium enhancement with a patchy-like contrast. There were no anomalies in the phosphocalcic metabolism. A malignant origin was unlikely as tumor biomarkers were normal, and full-body CT did not show an infra-clinical malignancy. Tuberculosis was also ruled out. Post-myocarditis origin was the most probable diagnosis, given the COVID-19 infection a month ago, wall motion abnormalities on TTE, LGE on MRI, and the absence of another possible cause.

Summary. Ischaemic stroke frequently reveals a cardiomyopathy, a rare one in this young patient: a post-myocarditis pericardial and myocardial calcification.

Conclusions. The role of multimodal imaging is essential to characterize the lesions. However, myocardial biopsy remains the gold standard.

CASE REPORT: ANCA ASSOCIATED VASCULITIS WITH LUNG AND KIDNEY DAMAGE CAUSED BY SARS-COV-2 INFECTION

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Keywords. ANCA associated vasculitis; SARS-CoV-2 infection; Diabetes mellitus type 1; Complications

Introduction. After 3 years long worldwide fight with SARS-CoV-2 infection the number of revealed severe long-term complications continue to grow. Many studies reports that SARS-CoV-2 infection may trigger manifestation of autoimmune diseases. One of them is antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV), which is systemic autoimmune diseases that may lead to renal failure and lung damage due to the infiltration of mononuclear cells and the destruction of small- and medium-sized blood vessels.

Case Description. A 39 year old male patient was admitted to Jelgava hospital with head injury and ketoacidosis, because of uncontrolled type 1 diabetes. The patient was diagnosed with SARS-CoV-2 infection which led to gradually increased shortness of breath. A family doctor sent patient to Pauls Stradins Clinical University Hospital (PSKUS) because of difficulty breathing, desaturation (SpO₂ 80%) and febrile temperature. The patient was sent to bronchoscopy, kidney biopsy and radiological examinations where destruction cavities in both lungs and mild mesangioproliferative changes was found. Because of suspicion of granulomatosis with polyangiitis, the autoantibody screening was performed in which positive anti-MPO and anti-PR3 antibodies were detected. Treatment of ANCA-associated vasculitis was initiated with Methylprednisolone, Clarithromycin and Voriconazole. After therapy, the patient's condition improved and he was signed out from the hospital.

Summary. Even mild SARS-CoV-2 infection can cause serious complications, for example, manifestation of autoimmune diseases – ANCA-associated vasculitis, which may lead to young patient's lung and renal damage.

Conclusions. SARS-CoV-2 infection is dangerous disease, which can lead to late complications, that can hardly affect patient's organism and quality of life. It is important to avoid infection and get vaccinated to reduce a chance of developing serious long-term complications, such as ANCA-associated vasculitis.

35-YEAR-OLD PATIENT WITH IDIOPATHIC CARDIOMYOPATHY

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Keywords. Idiopathic cardiomyopathy; Chronic heart failure; Sepsis

Introduction. Idiopathic cardiomyopathy is a type of heart muscle disease in which the heart becomes enlarged and weakened, making it less able to pump blood effectively. It is called idiopathic because the cause is often unknown. It typically presents with symptoms such as shortness of breath, fatigue, and swelling in the legs and ankles. Idiopathic cardiomyopathy can occur at any age and may be inherited in some cases.

Case Description. A 35-year-old woman, starting from the age of 14, suffers from dilated cardiomyopathy and chronic heart failure of IV-degree F.C. (NYHA). Patients have persistent complaints of shortness of breath, chest pain, and reduced physical tolerance. In 2022, the patient was admitted with complaints of acute abdominal pain and nausea with vomiting. Acute pancreatitis was suspected, which was later not confirmed by the results of tests and CT. Soon, the patient's condition worsened, arterial hypotension appeared, the patient was transferred to the intensive care. Catheterization of the central vein was performed, after 3 days the patient developed febrile body temperature, purulent discharge from the central catheter, the central catheter was evacuated. Based on blood culture *Enterobacter cloacae* was found which was severely manifested against the background of severe heart failure. Against the background of an improvement in the general condition of the patient antibiotic therapy was started, the patient was transferred to the cardiology.

Summary. This clinical case is an example of the progression of idiopathic dilatation cardiomyopathy with subsequent complications and severe heart failure.

Conclusions. The cause of idiopathic dilated cardiomyopathy is often unknown, but it can occur at any age and lead to serious complications that can increase susceptibility to serious nosocomial infections. Therefore, early diagnosis and management are crucial to prevent progression of the disease and improve the quality of life.

A 36-YEAR-OLD PATIENT WITH DILATED CARDIOMYOPATHY, MYOCARDIAL INFARCTION AND SEVERE SYSTOLIC DYSFUNCTION

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Keywords. Unstable angina pectoris; Dilated cardiomyopathy; Myocardial infarction; Heart transplantation; Autologous stem cell transplantation

Introduction. Heart disease ranks first in the world as the most common cause of death among people. Usually, problems with heart diseases occur in people in the second half of life, so diseases such as myocardial infarction are not typical for young people. This clinical case presents a patient who developed severe heart disease at an early age.

Case Description. On October 19, 2010, a 36-year-old patient with unstable angina pectoris was delivered to the hospital. The patient is known to have severe coronary disease with dilated cardiomyopathy with systolic dysfunction. It is also known that the patient suffered a circular myocardial infarction with Q in the anterior, lateral and lower wall of the left ventricle, with the formation of an aneurysm of the left ventricle with a diameter of 6.5 cm. On October 29, 2010, based on the decision of the council, heart transplantation was indicated as the only effective method of treating the patient, to which the patient gave his consent. On November 4, 2010, as an additional method of therapy, the patient underwent autologous stem cell transplantation; The patient is currently on the waiting list for a heart transplant.

Summary. The clinical case is an interesting example of a severe patient who was diagnosed at an early age with unstable angina pectoris, myocardial infarction, aneurysm, chronic heart failure IV degree (NYHA), as well as dilated cardiomyopathy.

Conclusions. In conclusion, it should be noted the importance of a personalized approach to the treatment and early diagnosis of patients with early cardiac diseases due to their rapid development and severe course. Early diagnosis and management are crucial to prevent progression of the disease and improve the quality of life.

IMPACT OF CANNABIS USE ON THE DEVELOPMENT OF ACUTE CORONARY SYNDROME: A CASE REPORT

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Keywords. Cannabis use; Δ9-tetrahydrocannabinol; Acute myocardial infarction

Introduction. Alarming trends concerning cannabis use have been noticed in recent years. Cannabis consumption is increasing, Δ9-tetrahydrocannabinol content is rising and the number of highly potent synthetic cannabinoids is growing. As a result, there is the emergence of marijuana related serious adverse health effects, including cardiovascular events. Research confirms the possible influence of marijuana consumption on the development of myocardial infarction.

Case Description. We describe a 44-year-old man with inferior ST-segment elevation myocardial infarction. Urgently performed coronary angiography showed occlusion in the proximal right coronary artery. Patient was managed by percutaneous coronary intervention and stent placement. During the questioning, he confessed that was smoking cannabis a few hours before the onset of symptoms and use marijuana once a week for 5 years already.

Summary. Studies have shown that cannabis use affects hemodynamics by causing temporary tachycardia and hypertension. Smoking cannabis also increases blood carboxyhemoglobin levels and can induce atherosclerosis. These effects on the cardiovascular system can lead to myocardial infarction, the risk of which is highest within the first hour of consumption. Epidemiological data show that cannabis users who have suffered a heart attack tend to be young and less likely to have other cardiovascular risk factors.

Conclusions. This case demonstrates that marijuana use must be considered as a possible trigger for acute coronary syndrome, therefore healthcare professionals should ask about cannabis use when collecting a medical history from patients with myocardial infarction. The public should be made aware of the potential cardiovascular side effects of cannabis use.

LYME CARDITIS: A REVERSIBLE CAUSE OF SECOND DEGREE AV BLOCK

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Keywords. Lyme Disease; Atrioventricular block; Lyme carditis

Introduction. Lyme carditis is a rare complication of Lyme disease with a prevalence of 0.3–4.0 percent in untreated adults. Clinical signs of Lyme carditis can be observed approximately after 1–2 months following the manifestation of the erythema migrans rash. Most commonly Lyme carditis presents with some degree of AV block.

Case Description. A 57 year old female was admitted to LUHS Kaunas Clinics with the heart rate ~ 40 beats per minute. Patient had a 1 week history of dyspnea on exertion, chest and epigastric pain, heart palpitations. Laboratory tests were in normal range including troponin. ECG showed a 2nd degree, type II AV block and 0.5 mm ST elevation in III, Avf (nonspecific). Treatment with sol. Salbutamoli 1000 mcg iv was started. Patient was investigated for possible causes of the blockade: heart ultrasound showed II° mitral regurgitation and II° tricuspid regurgitation; coronarography showed no stenosis in the coronary arteries. Women revealed that 2 months ago she spotted a dynamically spreading rash on her thigh, according to photo – rash was similar to erythema migrans. Suspecting Lyme disease, antibodies were taken and empiric treatment with ceftriaxone was initiated. Several days later antibodies against *Borrelia burgdorferi* in blood serum came positive confirming the diagnosis. The treatment was continued until changes in the ECG reverted, then it was switched to oral doxycycline to complete cycle for 21 days.

Summary. Studies have shown that cannabis use affects hemodynamics by causing temporary tachycardia and hypertension. Smoking cannabis also increases blood carboxyhemoglobin levels and can induce atherosclerosis. These effects on the cardiovascular system can lead to myocardial infarction, the risk of which is highest within the first hour of consumption. Epidemiological data show that cannabis users who have suffered a heart attack tend to be young and less likely to have other cardiovascular risk factors.

Conclusions. In patients with an AV block of an unknown etiology, Lyme carditis should be considered as a differential diagnosis to start early empiric treatment.

A RARE CASE OF AUTOSOMAL DOMINANT PSEUDOHYPOPARATHYROIDISM TYPE 1B

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Keywords. Autosomal dominant pseudohypoparathyroidism; Hypocalcemia

Introduction. Pseudohypoparathyroidism type 1B (PHPTT1B) is a rare disorder caused by a methylation defect at the GNAS coding sequence. It is characterized by PTH resistance in the proximal renal tubules, presenting with increased serum PTH, hypocalcemia, hyperphosphatemia. The majority of PHPTT1B cases are sporadic, but PHPTT1B may occasionally present as familial, with an autosomal dominant pattern of transmission.

Case Description. This case describes a family with autosomal dominant PHPTT1B. A 34-year-old male was referred to the Endocrinology Department at the age of 17. The laboratory results were suggestive of PTH resistance, TSH resistance, and hypergonadotropic hypogonadism. He was diagnosed with pseudohypoparathyroidism. DXA revealed secondary osteoporosis. Follow-up cerebral CT found abnormal deposits of calcium (Fahr's syndrome). His 17-year-old sister at the age of 8 was hospitalized at the Paediatrics Department with complaints of leg and arm cramps. She presented with PTH and TSH resistance. Her older sister at that time had no complaints. 3 years later methylation-specific MLPA test was suggested for the younger sister and it confirmed the diagnosis of AD-PHPTT1B. Blood examination of the mother of siblings showed only PTH resistance. DXA showed osteopenia of the lumbar spine and femur. Two siblings with TSH resistance received levothyroxine; a 34-year-old male additionally received testosterone propionate/testosterone phenylpropionate/testosterone isocaproate/ testosterone decanoate injections. All of the family members received cholecalciferol and calcium supplements. Treatment led to the remission of the symptoms.

Summary. The case report demonstrates the treatment and variable clinical manifestations of a family with AD-PHPTT1B.

Conclusions. PHPT is a complex disorder demonstrating extreme individual variability. It can remain undiagnosed till early and late adulthood if it remains asymptomatic. Genetic testing is significant for differentiation between the types and subtypes of PHPT and differentiates familial forms from sporadic ones, which is necessary for appropriate and early treatment.

DRUG-INDUCED MOVEMENT DISORDERS: SULFASALAZINE-ASSOCIATED CHOREA

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Keywords. Sulfasalazine; Drug-induced movement disorders; Chorea

Introduction. Chorea is a hyperkinetic movement disorder characterized by involuntary, brief, non-rhythmic movements. Late adult-onset chorea is rare: less than 0.3% of the patients are over 55 years old. In most cases, chorea may be caused by hereditary neurodegenerative diseases, autoimmune disorders, metabolic derangement, hormones or certain drugs. We report a case of chorea in a patient under sulfasalazine treatment for ankylosing spondylitis. Neurotoxicity secondary to sulfasalazine was suspected.

Case Description. A 64 years old man complains of involuntary movements, grimacing lasting for several months. Patient took these medications due to chronic illnesses: trihexyphenidyl, trimetazidine, vinpocetine, domperidone, nebivolol, monoxidine, aspirin, perindopril, rosuvastatin, perindopril arginine/indapamide/amlodipine, tardyferon, mildronate, sulfasalazine (500 mg twice a day for several months). Neurological examination showed involuntary movements with blowing cheeks, grimacing, dysarthria. Blood tests: everything was in normal reference range. No signs of abnormalities were detected in brain CT and MRI scans. Secondary chorea was suspected as a side effect of medications. The patient was consulted by a clinical pharmacologist: it was clarified that patient wasn't taking antipsychotic drugs, drugs against parkinsonism and there was no history of movement disorder or psychiatric illness. Dyskinesia can be caused by sulfasalazine, domperidone, trimetazidine – discontinuation of these medications was recommended. After suspending sulfasalazine and trihexyphenidyl patient's condition improved, the neurological deficit regressed.

Summary. 64 years old male was admitted to hospital because of abnormal involuntary movements. After thorough diagnostics patient was diagnosed with secondary chorea due side effect of sulfasalazine. After suspending medication, male's neurological status improved.

Conclusions. Polypharmacy in the elderly is actual problem. It could be as a potential etiology of hyperkinetic movement disorders. In clinical practice it is important to identify this when other possible causes are excluded.

AUTOIMMUNE ATROPHIC GASTRITIS ASSOCIATED WITH GASTRIC NEUROENDOCRINE TUMOR

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Keywords. Autoimmune atrophic gastritis; Gastric neuroendocrine tumor

Introduction. Autoimmune gastritis (AIG) is a special type of chronic gastritis wherein autoimmune disorders caused by cellular immunity result in loss of parietal cells and production of an antiparietal cell antibody (PCA) against the proton pump. This condition is associated with Type-1 gastric neuroendocrine tumor (G-NET) secondary to achlorhydria and hypergastrinemia. G-NETs are rare neoplasms with origin in the peripheral neuroendocrine system in the stomach. Annual incidence of G-NET is 0.68% per person-year.

Case Description. 45-year-old female complained with nausea and acid reflux. Laboratory tests revealed an elevated chromogranin A (720 µg/L), gastrin (> 600 pmol/L) and positive PCA (1:100). Esophagogastroduodenoscopy (EGD) was performed and displayed a severely atrophic lining of the stomach body, two 0.3 cm polyps and hyperemic spots. Additionally to polypectomy several biopsies were taken to test for NET, H. Pylori and inflammation. Histological examination of polyp confirmed active G-NET G1, chronic atrophic gastritis with intestinal metaplasia in stomach lining, H.Pylori was negative. Somatostatin analogue scintigraphy was performed for NET recurrence, but no metastasis were detected. Prospectively chromogranin A (463.09 µg/L) decreased. No specific treatment was intended, patient was recommended a follow-up EGD and monitoring for B12 anemia.

Summary. In this case we presented a patient with non-specific gastroenterological symptoms. Laboratory findings suggested possible autoimmune gastritis with NET, therefore EGD was performed and biopsies were taken. Histological results confirmed the suspected diagnosis. Characteristic clinical findings were related to type 1 G-NET.

Conclusions. The significance of diagnosing AIG is to include patients as a high-risk group for the development of gastric NETs. Identifying the type of G-NETs is a collective effort of clinical and pathologic correlation. Correct grading and staging of these lesions is significant for treatment and prognosis. Type I lesions are treated by endoscopic mucosal resection. Supplementing vitamin B12 is recommended.

OPPORTUNISTIC INFECTION IN A PATIENT ON IMMUNOSUPPRESSIVE TREATMENT: A CASE REPORT

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Keywords. Juvenile idiopathic arthritis; Opportunistic infection, treatment

Introduction. Juvenile idiopathic arthritis (JIA) is the most prevalent rheumatologic disorder among pediatric patients. An immunosuppressive treatment is usually prescribed to control the disease, although the risk of opportunistic infections is expected to increase. The goal of this case report is to present an observed opportunistic infection in a patient with JIA and overview its impact on the treatment plan.

Case Description. A 15-year-old girl was diagnosed with rheumatoid factor positive juvenile idiopathic polyarthritis at age 12 years. Disease remission was induced with short term prednisolone and long term treatment with methotrexate and tumor necrosis factor inhibitor (anti-TNF). However, arthralgia tended to exacerbate periodically and a nonsteroidal anti-inflammatory drug diclofenac was administered. After a week of additional treatment a patient presented with a blistering rash on the face. Acyclovir was prescribed for suspected Herpes simplex reactivation with no effect. Subsequently, blisters were emerging on the eyelids and neck, turning into wet wounds under the lower lip. Staphylococcus aureus, susceptible to oxacillin and bisepitol, has grown from the wound culture. Antibiotic treatment was prescribed for 1 week, the patient's condition improved. Methotrexate and anti-TNF were stopped temporarily with concern of possible dissemination of infection. However, after three days finishing antibiotics, rashes reappeared. Recurrent impetigo was diagnosed, bisepitol was prescribed. Total course of antibiotic treatment was 14 days. After this patient is taking disease modifying antirheumatic drugs (DMARDs) regularly.

Summary. An immunosuppressive patient, diagnosed with recurrent impetigo in the face area caused by Staphylococcus aureus. The treatment was prescribed according to bacterial culture results. The immunosuppressive treatment plan was modified individually.

Conclusions. Autoinflammatory diseases are often related to immunosuppressive treatment leading to a higher probability of infection. There are no strict recommendations about the DMARDs tactics during opportunistic infections. The appropriate individual treatment plan is crucial to the fast health improvement.

LIFE-THREATENING COMPLICATIONS OF CUSHING'S SYNDROME: A CASE REPORT

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Keywords. Cushing's syndrome; Hypercortisolism; Bilateral adrenalectomy

Introduction. Cushing's syndrome (CS) is a rare disease, characterized by elevated cortisol levels in the blood. ACTH-secreting tumours sometimes can be difficult to identify and persistent hypercortisolism may lead to serious complications.

Case Description. A 31-year-old man presented complaints of excessive weight gain, fatigue, and limb weakness in 2009. Clinical examination revealed reddish-purple striae and he was found to have hypertension. In 2014, the patient was diagnosed with type 2 diabetes. Laboratory tests showed normal range of cortisol, elevated ACTH (71.5 ng/L (n.r. 1.63–14.15)), and loss of cortisol diurnal rhythm (morning cortisol: 565 mmol/L (n.r. 177–578), late-night cortisol: 429 mmol/L). During this time, the patient was admitted to intensive care unit (ICU) due to bilateral pneumonia, sepsis, septic shock, and multiple organs dysfunction syndrome. After recovery, ACTH level remained elevated (103 ng/L). Additionally, low-dose and high-dose dexamethasone suppression tests were performed, which suspected ectopic ACTH secretion. However, ectopic tumour was not identified despite extensive laboratory, endoscopic, and imaging examinations. Treatment with metyrapone was initiated. In 2018 the patient was treated in ICU for the second time due to pneumonia and pyelonephritis complicated with sepsis and septic shock. Eventually, mixed-hypertensive nephropathy, caused by difficult-to-control hypertension and complications from previous infections, led to stage 5 chronic kidney disease requiring hemodialysis. In 2019, due to insufficient control of hypercortisolism, bilateral adrenalectomy was performed and treatment with hydrocortisone was initiated. Adrenalectomy resulted in improved well-being, however, the cause of CS was not found despite repeated extensive examinations.

Summary. This clinical case demonstrates that persistent hypercortisolism may result in acute and life-threatening complications.

Conclusions. Bilateral adrenalectomy should be considered as a treatment option in the most complicated hypercortisolism cases.

ACUTE KIDNEY INJURY CAUSED BY NON-HODGKIN LYMPHOMA'S LYMPHADENOPATHY

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Keywords. Non-Hodgkin lymphoma; Lymphadenopathy; Anuria; Urosthesis; Acute kidney injury; Aephrosthomy; Acute hemodialysis

Introduction. Non-Hodgkin lymphoma is a typically nodal, nonsymmetric cancer, that is often palpatory defined as a painless enlargement of lymphatic nodules. Lymphadenopathy can cause an extrinsic ureters' obstruction. Renal involvement with lymphoma is extremely rare, 3–8% of patients.

Case Description. A 59-year-old patient was admitted (04.07.) to Pauls Stradiņš Clinical University Hospital due to 36 h anuria with a hypertensive crisis (250/130 mmHg). Patient's physical examination revealed enlarged lymph nodes of neck (2 cm) and inguinal region (4 cm). Previously, patient's CT (03.05.) showed cervical, thoracic, abdominal, and inguinal lymphadenopathy. A non-Hodgkin lymphoma was histologically diagnosed on 15.06. PET was ordered on 14.07. Chemotherapy was not ordered until the procedure. Biochemistry (04.07.): creatinine 1609 µmol/L (GFR 3 mL/min, CKD-EPI creatinine), urea 28.06 mmol/L, K⁺ 5.8 mmol/L. Abdominal ultrasonography: grade II urosthesis in the left kidney. A **percutaneous nephrostomy** was indicated. Biochemistry (05.07.): creatinine 1714 µmol/L, K⁺ 6.2 mmol/L, P 4.34 mmol/L. As a result of a non-sufficient effect of the nephrostomy, two procedures of **acute hemodialysis** were performed. Patient became polyuric (07.07.) through the nephrostomy and ureters. The nephrostomy was 2 times closed and opened due to urosthesis. An **antegrade pyelogram** revealed a slight narrowing in the third distal part of the left ureter without an obturation. Patient was treated with corticosteroids, cervical and inguinal lymph nodes reduced by 2 times. Patient was discharged from the hospital with a stable hypertension, GFR 63 mL/min and the nephrostomy. It was evacuated in September after a successful chemotherapy (26.09.).

Summary. Patient with nodal non-Hodgkin lymphoma before chemotherapy appear with extrinsic ureteral compression. Acute kidney injury caused by lymphoma's lymphadenopathy with GFR < 5 mL/min (KDIGO guidelines) is an indication to acute hemodialysis.

Conclusions. Corticosteroids, percutaneous nephrostomy, acute hemodialysis are used to reduce urosthesis and resume urination

SUDDEN MONOCULAR VISION LOSS: CASE REPORT

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Keywords. Optic neuritis; Multiple sclerosis

Introduction. Optic neuritis (ON) is an inflammation of the optic nerve. Symptoms include decreased visual acuity, pain exacerbated by eye movements, abnormal color vision and central scotoma.

Case Description. A 22-year-old man complained about acute visual impairment, disturbed color vision and painful eye movements of the left eye for two weeks. Visual acuity (Snellen chart, Landolt C optotype) was 1.0 in the right eye and 0.2 in the left eye. The visual field test showed central scotoma of the left eye. Palpebral fissures were symmetric. Eye movements were normal. The findings of the anterior segment were within normal limits. Fundoscopy revealed pallor of left optic disc. Optical coherence tomography demonstrated the thinning of retinal nerve fiber layer in the left eye. Magnetic resonance imaging showed multiple demyelinating lesions and left optic neuritis. Patient was diagnosed with retrobulbar neuritis, and according to McDonalds criteria was made diagnosis of Multiple sclerosis. Lumbar puncture was performed and oligoclonal bands were found in cerebrospinal fluid, chronic infections were excluded. Intravenous methylprednisolone therapy was administered for three days and then followed by peroral prednisone according to the scheme (1mg/kg). After five days of treatment visual acuity significantly improved (left visual acuity 0.7).

Summary. Optic neuritis can be associated with demyelinating or infectious diseases, noninfectious inflammation. We present a clinical case of a sudden monocular vision loss in a young man caused by optic neuritis associated with multiple sclerosis with a good visual recovery after treatment with intravenous methylprednisolone.

Conclusions. ON is the most common optic neuropathy in young adults. There is a strong association between ON and multiple sclerosis.

CASE REPORT: INCIDENTAL DIAGNOSIS OF HEMOCHROMATOSIS TYPE I

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Keywords. Hereditary hemochromatosis; Iron metabolism; Phlebotomy

Introduction. Hereditary hemochromatosis (HH) is a genetic disorder inherited in an autosomal recessive pattern. The pathogenesis of this condition is excessive intestinal absorption of dietary iron, resulting in pathologically high iron storage in tissues and organs. As a systemic disease, it has several manifestations including cirrhosis, diabetes mellitus, arthropathy, cardiomyopathy. However, the majority of patients are asymptomatic. The most common form of hemochromatosis is type I, related to HFE gene mutation.

Case Description. 52-year-old man was referred to a gastroenterologist due to an incidental finding of significantly increased ferritin. Laboratory tests of further examination revealed: increased iron (44.40 µmol/L), ferritin (1000 µg/L) concentrations and elevated transferrin saturation (92%). No pathological findings or liver damage were detected in the abdominal ultrasound. Regarding the significant results of laboratory tests, patient was addressed to a medical geneticist. Thereafter, detection of homozygous mutation of the HFE gene (c.845G > A and c.187C > G) confirmed the diagnosis of HH. He later was consulted by a cardiologist, whereas cardiac MRI showed a low T1 MAP value in the interventricular septum due to an iron overload. Phlebotomy along with a low-iron and vitamin C diet were intended for the treatment. Targeted ferritin goal is < 100 µg/L.

Summary. We presented a case of asymptomatic patient who was incidentally diagnosed with hereditary hemochromatosis. Fortunately, the disease was recognised before any complications had occurred. Characteristic findings of iron, ferritin and transferrin tests together with cardiac MRI and genetic analysis confirmed the diagnosis of HH. In order to reduce the amount of iron, phlebotomy was indicated.

Conclusions. HH usually remains unnoticed due to the absence of clinical symptoms. Consequently, the disease can cause serious complications such as liver cirrhosis, hepatocellular carcinoma or cardiomyopathy. Genetic testing is pivotal for diagnosis. Phlebotomy remains the only recommended treatment and should be undertaken in a case-specific manner.

SALT-LOSING TUBULOPATHY: A GITELMAN SYNDROME CASE REPORT

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Keywords. Salt-losing tubulopathy; Gitelman syndrome; Hypokalemia; Hypomagnesemia

Introduction. Gitelman syndrome (GS) is an autosomal recessive salt-losing renal tubulopathy arising from mutations in the thiazide-sensitive Na-Cl cotransporter gene. Gitelman syndrome is characterized by hypokalemic metabolic alkalosis in combination with significant hypomagnesemia and low urinary calcium excretion. The prevalence is estimated at approximately 1:40,000.

Case Description. A 48-year-old female admitted to hospital to evaluate an unknown electrolyte imbalance. Previously this year the patient had two syncope episodes, once admitted to hospital where hyponatremia and hypokalemia were found. After consultation with a neurologist, brain MRI, EEG, echocardiogram, Holter monitoring and duplex US for brachiocephalic vessels were performed, with no significant findings. During recent hospitalisation patient had a mild hyponatremia (135 mmol/L), mild hypomagnesemia (0.55 mmol/L) and moderately severe hypokalemia (2.3 mmol/L). In 24-hour urine low calcium excretion (0.34 mmol/L/dn) was detected as well as high fractional excretion of potassium (11%). In arterial blood gas was mild metabolic alkalosis with pH 7.44, HCO₃ 31.9 mmol/L. The woman admitted to having nocturia since adolescence. She had no dietary restrictions and no medication except for citalopram. Levels of morning cortisol and 24-hour urine cortisol were within normal range, which excludes adrenal insufficiency. Thus, Gitelman syndrome was suspected. Patients electrolyte imbalance was treated with intravenous potassium chloride and magnesium sulfate.

Summary. Electrolyte substitution will ease patients symptoms of nocturia and decrease possibility of syncope. The patient will require a lifelong oral supplement therapy and regular serum electrolyte level control.

Conclusions. Gitelman syndrome should be considered in patients with hypokalemia and hypomagnesemia, when no other etiology can be identified. Due to its low incidence and lack of awareness, Gitelman syndrome can be easily misdiagnosed or missed in diagnosis. To confirm diagnosis genetic testing may be performed.

NON-STEROIDAL ANTI-INFLAMMATORY DRUG- INDUCED PROTEIN-LOOSING ENTEROPATHY COMPLICATED BY INTESTINAL OBSTRUCTION

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Keywords. NSAIDs; Enteropathy; Diarrhea; Intestinal obstruction

Introduction. Non-steroidal anti-inflammatory drugs (NSAIDs) are one of the most commonly prescribed drugs in the world. Most frequent adverse events of NSAIDs are upper gastrointestinal damage and bleeding. Nevertheless, it is known NSAIDs may cause the damage of small and large intestine including ulcerations, stenosing and protein-losing enteropathy.

Case Description. A 47-year-old woman was admitted to the Gastroenterology Department due to more than 6 months lasting diarrhea, weakness and edemas of legs. Patient had history of long-term iron deficiency anemia and post-traumatic healing-resistant trophic ulcers of lower extremities. Because of the injury-related pain, she was constantly consuming Diclofenac for 8 years, even up to 10 tablets (150 mg per tablet) per day. Laboratory tests revealed hypoalbuminemia (12 g/L), hypoproteinemia (31.3 g/L) and iron deficiency anemia (Hb 106 g/L). Initial endoscopy and radiology investigations identified ulceration in the large intestine, thickened wall of terminal ileum, non-contradictory results of histological examination led to suspicion of Crohn's disease (CD). Repeated full ileocolonoscopy revealed four ulcerated and fibrosing strictures located in the right part of the colon, therefore the endoscopic balloon dilation was applied and consideration of NSAID enteropathy occurred. Treatment with the previously prescribed Mesalazine and NSAID treatment was discontinued. Unfortunately, patient's condition was complicated by intestinal obstruction, thus resection of 80 cm segment of small intestine was performed. Eventually, postoperative histopathological analysis of resection specimen excluded CD and, regarding clinical findings, NSAID enteropathy was confirmed.

Summary. In this clinical case we presented a patient with troublesome protein-losing enteropathy, chronic diarrhea, non-healing trophic ulcers and history of long-term use of Diclofenac, who was diagnosed with NSAID-induced enteropathy. Disease caused strictures led to intestinal obstruction.

Conclusions. Intestinal lesions caused by NSAID misuse could be as severe as upper gastrointestinal damage. These medications should be prescribed rationally and used under supervision of a specialist.

PERIANEURYSMAL RETROPERITONEAL FIBROSIS: A RARE CASE OF ACUTE KIDNEY FAILURE

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Keywords. Radiology; Nephrology; Retroperitoneal fibrosis; Periaortitis; Acute kidney failure; Ormond's disease

Introduction. Perianeurysmal retroperitoneal fibrosis (RPF) is a part of a disease spectrum of retroperitoneal fibrosis (RF), an uncommon fibro-inflammatory condition characterised by adventitial and periadventitial inflammation, medial thickening, and advanced atherosclerosis, with further ureteral involvement. In many cases RF is one of the most common presentations of IgG4-related disease.s

Case Description. A 57-years old man was presented to Pauls Stradiņš Clinical University hospital with a 3-week history of nausea and mild lower back pain. An early USG revealed acute bilateral hydronephrosis. Following CT scan revealed an infrarenal abdominal aortic aneurysm with retroperitoneal soft tissue mass surrounding the aortic aneurysm 7.8×8.2 cm Ø, with penetrating atherosclerotic ulcer at L4 level, but no active extravasation. Furthermore, bilateral ureteral compression causing stage III hydronephrosis and inferior vena cava compression was noticeable. Bilateral hydronephrosis was treated with pigtail catheter placement in both kidneys. Laboratory examination revealed the patient to be IgG4 negative, and constantly high blood urea levels and serum creatinine, for which the patient was administered to dialysis. Despite the treatment and slight improvement in renal function, the patient developed multiorgan failure, which led to lethal outcome.

Summary. A patient with a rare case of perianeurysmal retroperitoneal fibrosis with acute kidney failure, leading to lethal outcome.

Conclusions. CT imaging is essential for the diagnosis and treatment of perianeurysmal RPF. However, RF remains an uncommon cause of severe acute kidney failure, leading to delayed diagnosis when these patients present outside of specialised clinics. Retroperitoneal fibrosis should be considered in older patients with acute kidney failure, even in the absence of ultrasonographic evidence of obstruction.

A CASE REPORT OF SUCCESSFUL RECURRENT CORNEAL EROSION'S TREATMENT WITH PHOTOTHERAPEUTIC KERATECTOMY

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Keywords. Recurrent corneal erosion; Phototherapeutic keratectomy

Introduction. Recurrent corneal erosion (RCE) typically occurs in eyes that have had previous abrading injuries or corneal dystrophies (even years prior). Commonly RCE is treated conservatively. But in this case report phototherapeutic keratectomy (PTK) was performed after a long-term failure of conservative treatment to improve the patient's quality of life.

Case Description. A 32-year-old woman presented to the Ophthalmology Outpatient Department with pain and tearing in her left eye (LE). Her medical history revealed that she had been diagnosed with corneal erosion after ocular trauma in autumn 2021, when LE was injured with a tree branch. After treatment at that time the patient's condition had improved and her symptoms had disappeared. However, in 2022 winter, tearing and severe pain in the LE recurred, especially when upon awakening at night – the patient was diagnosed with RCE. The patient has used VitA-Pos ointment since then, unfortunately all the above symptoms have been reoccurring, also visual acuity had decreased. At the admission the patient's best corrected visual acuity was 0.4 in the LE. Slit lamp examination revealed corneal erosion and unstable peeled off epithelium in the center of the cornea. The final diagnosis of RCE was made based on the patient's medical history and examinations. Next day PTK was performed under local sol. Alcaine anesthesia. After surgical procedure a protective contact lens was applied, and local treatment was prescribed with Levofloxacin 0.5% eye drops 4 times a day for 2 weeks in the left eye. The patient did not have any recurrence of erosion since then.

Summary. A 32-year-old patient one year after trauma was diagnosed with RCE again and successfully treated with PTK.

Conclusions. Conservative treatment is often ineffective, and the pathology significantly reduces patients' quality of life, so PTK is a treatment option with good results.

A MULTIDISCIPLINARY APPROACH TO THE PATIENT WITH CHRONIC PANCREATITIS AND NEPHROTIC SYNDROME

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Keywords. Chronic pancreatitis; Nephrotic syndrome

Introduction. Chronic pancreatitis is a progressive inflammatory disease that can cause destructive changes in exocrine and endocrine part of the parenchyma. Disease is associated with a high risk of complications, including kidney and liver damage.

Case Description. Patient, 53 years old, for several months, complaints of breath shortness, periorbital and leg edema, rapidly increasing abdominal volume, epigastric pain, severe weakness, loss of appetite. History of thromboembolism, endarterectomy, chronic pancreatitis. Stationed for kidney biopsy. On admission, nephrotic syndrome was detected with severe hypoalbuminemia 13.1 g/L, urine protein > 10 g/L, 24 h urine protein 3.66 g/24 h, massive ascites. According to vital indications, patient underwent ascites puncture and a drain was inserted. Inflow of pancreatic juice was detected in abdominal cavity. Additional imaging was performed – fluid inclusions up to 2 cm in the neck and tail parts, dilatation of the side branches of the tail were visible. The patient receives i/v albumin 20%, steroid therapy is started, ascites (drained 12l), edema and proteinuria decreases. As the clinical picture improved, outpatient therapy was prescribed. After 2 weeks, the council of surgeons, radiologists and nephrologists decided to perform kidney biopsy. Pancreatic draining surgery is not indicated, because the fluid collections have disappeared with the reduction of ascites. Kidney biopsy was performed – minimal change glomerulonephritis. Ascites and peripheral edema have disappeared.

Summary. A patient with persistently dynamic complaints, chronic pancreatitis and nephrotic syndrome was diagnosed in a timely manner, complications prevented and appropriate treatment initiated by a multidisciplinary approach.

Conclusions. Multidisciplinary approach is preferred in the diagnosis of complicated clinical cases and in the evaluation of further tactics. This type of approach can radically change the clinical diagnosis and methods used in the treatment, thereby improving the overall quality and outcome of treatment.

LOSE GLOBE EYE TRAUMA

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Keywords. Ocular trauma; Close globe trauma

Objectives. Ocular trauma is the leading cause of monocular blindness worldwide. The aim of this study is to identify clinical outcomes of close globe ocular injuries (CGI).

Materials and Methods. The medical records of all adult patients treated for CGI at a hospital of LUHS KC, Ophthalmology Department, during the year 2021, were retrospectively reviewed. Data analysis included sex, age, trauma cause, type, initial and final results of an ophthalmological examination. Visual acuity (VA) was assessed according to the Snellen decimal system. Eye injuries were classified by Birmingham Eye Trauma Terminology and Ocular Trauma Classification System. Data was analysed using SPSS version 27. The mean, standard deviation, Fisher's exact test and the Spearman correlation coefficient (R) were used. A P-value < 0.05 was considered statistically significant.

Results. Out of 37 cases 34 (91.9%) were male and 3 (8.1%) were female in a ratio of 11.3:1. The mean age was 47 years (± 2). The majority of CGI were caused by blunt objects (21 cases 56.8%). The most common blunt object was a blunt work tool (4 cases 20%) and a car traffic accident (3 cases, 15%). Ocular contusion (24 cases 66.7%), partial thickness corneal wound (13 cases 36.1%), hyphema (19 cases 52.8%) and corneal erosions (6 cases, 16.7%) were the most common presentations of CGI. The most common initial (11 cases 29.7%) and final (18 cases 48.6%) VA was grade 1 ($VA \geq 0.5$). The grade 4 initial VA ($1/\infty$ -0.02) was significantly more common in CGI caused by a sharp object compared to a blunt object ($p = 0.005$). Good (18 cases 48.6%) visual outcome was the most common outcome of CGI. There was a statistically significant correlation between the grade of initial and final VA ($R = 0.753$, $p < 0.001$).

Conclusions. CGI had good visual outcome as they were more likely to have grade 1 final VA.

OUTCOMES AFTER THERAPEUTIC KERATOPLASTY OF PATIENTS WITH INFECTIOUS KERATITIS AT THE PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL

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Keywords. Infectious keratitis; Keratoplasty; Cornea

Objectives. Infectious keratitis caused by microorganisms (MO) is primarily treated with medication, but if the therapy is not effective and causes permanent damage to the cornea, a keratoplasty is recommended. The aim of the study was to evaluate the improvement of visual acuity (VA) after corneal transplantation and to analyse the relationship between the microorganisms found and the improvement of vision

Materials and Methods. This was a retrospective, single-center study based on the medical records of thirty-five patients who had therapeutic keratoplasty after MO caused infectious keratitis at Pauls Stradiņš Clinical University Hospital (February 2020 – December 2022). VA was determined for each patient before and after keratoplasty, and a swab of cornea was taken from each patient to analyze MO culture. MS Excel and IBM SPSS v28.0 (McNemar test) were used to analyze the data.

Results. The study included 35 patients of whom 34.3% (n = 12) were male and 65.7% (n = 23) were female. The median age was 61 ± 17.87 (SD) years (range, 19–95 years). 48.6% (n = 17) of cases was right eyes and 51.4% (n = 18) was left eye. Statistically significant differences (p < 0.001) were found comparing data before and after the keratoplasty. Median VA before transplantation was hand movements, after 0.04 (measured with ETDRS chart). Totally, 26 different microorganisms were found, most of them *Staphylococcus epidermidis* 20%, *Staphylococcus aureus* 11.4% and 8.6% *Staphylococcus hominis*. The best visual improvement was with *Candida parapsilosis* and *Staphylococcus epidermidis* (from hand movement to 0.2 with ETDRS chart).

Conclusions. Keratoplasty plays a vital role to improving VA in cases where medical therapy does not help in MO caused infectious keratitis. The causative microorganisms of infectious keratitis could play a role in outcome of VA after therapeutic keratoplasty. However, for the approval of this statement, further studies with more patients are needed.

VISUAL NEURAL FACILITATION IN A LONG-TERM VISUAL SEARCH TASK ON A VOLUMETRIC MULTIPLANAR DISPLAY: AN ERP STUDY

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Keywords. Electroencephalography (EEG); Visual search task; Stereoscopic; Volumetric multiplanar; Depth perception

Objectives. Electroencephalography (EEG) is used not only for diagnosing neurological diseases but is also applied to the study of cognitive performance, such as the central brain functions associated with stereoscopic vision. Stereovision has been extensively studied for many years through various studies that measure the properties of the visual system. However, a few studies are working on new technologies that present a real three-dimensional (3D) image. Currently, technology companies aim to offer highly immersive depth perception through techniques that do not have adverse effects on binocular vision, for instance, accommodation-convergence conflict. One of the techniques is volumetric multiplanar where a real 3D image can be perceived without any extra goggles. Furthermore, any new equipment must meet the standards for human-body ergonomic interaction. Thus, in this research, we aim to objectively study the impact of the long-term use of a volumetric multiplanar display on the human visual system.

Materials and Methods. To reach our aim, we designed an electroencephalographic (EEG) study since this method has many beneficial aspects such as easy to handle and record data, portability, and high temporal resolution. Recorded data was later analyzed by EEGLAB software to study event-related potentials (ERPs).

Results. The results indicated a significant alteration in the P3 component at the parietal electrodes, both in terms of amplitude and latency, and in the N2 component at the frontal electrodes. Additionally, the power spectral density (PSD) analysis revealed a significant discrepancy at five electrode sites: Fz, Cz, C4, T5, and O1.

Conclusions. In conclusion, while the increase in the amplitude of components might indicate fatigue during 3D image perception, the reduction in latency might suggest neural facilitation in perceiving a 3D image on the volumetric display after prolonged visual tasks and could be a sign of facilitated learning processes.

INTRAOCULAR PRESSURE CHANGE COMPARISON IN CHRONIC OPEN-ANGLE GLAUCOMA SURGERY PATIENTS

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Keywords. Chronic open-angle glaucoma, intraocular pressure, glaucoma surgery

Objectives. Chronic open-angle glaucoma (COAG) is a progressive optic neuropathy associated with a loss of retinal ganglion cells and their axons. Important role in COAG progression is attributed to intraocular pressure (IOP) increase. The aim of our study was to evaluate IOP change in COAG surgery patients before and after surgery.

Materials and Methods. A retrospective study was performed in 34 COAG patients with glaucoma surgeries performed between January 2018 and December 2022. IOP was measured using rebound tonometry. We analyzed intraocular pressure change comparing IOP preoperatively and postoperatively in COAG patients. Statistical analysis was performed using IBM SPSS v27.0 and Microsoft Excel. Data was presented as medians with the interquartile range (IQR, 25%–75%). Wilcoxon signed-rank test was used to determine whether there is a statistically significant difference in IOP change. A p-value ≤ 0.05 was considered statistically significant.

Results. In all patients (n = 34) sinustrabeculectomy with basal iridectomy was chosen as glaucoma surgery technique and in 5 patients (14.7%) at least one operation for glaucoma has been performed on the eye being operated on. The median patient age was 72.5 (64.0–77.0). 58.8% of patients (n = 20) were female. 41.2% of patients (n = 14) were male. Preoperative IOP median in the COAG patient group was 35.0 (31.0–39.0) mmHg. Average IOP preoperatively was 35.5 mmHg. Postoperative IOP median in the COAG patient group was 16.0 (12.0–18.0) mmHg. Average IOP postoperatively was 15.6 mmHg. Comparing average IOP preoperatively and IOP postoperatively, there is a 56.0% decrease in IOP. Comparing IOP changes before and after glaucoma surgery, statistically significant decrease in eye pressure was observed (p < 0.001).

Conclusions. Significant decrease in average IOP in COAG patients was observed with an average decrease in IOP for more than a half (56.0%) that confirms the effectiveness of glaucoma surgery with a significant decrease in IOP pressure.

LONG TERM OUTCOMES IN CHOROIDAL MELANOMA AFTER RUTHENIUM APPLICATOR BRACHYTHERAPY

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Keywords. Choroidal melanoma; Ruthenium-106 applicators; Brachytherapy

Objectives. Choroidal melanoma is the most common primary intraocular tumor in adults. One of the treatment methods is ocular brachytherapy which uses radioactive β -ray target delivery to the tumor via radioactive plaque. The aim was to determine effectiveness and long term outcomes of Ruthenium-106 brachytherapy in choroidal melanoma patients.

Materials and Methods. A retrospective study was performed using 18 medical records of patients who received Ru-106 brachytherapy in East Tallin Central Hospital in the period from 2018 to 2022. Brachytherapy results (tumor height, visual acuity, complications) were analyzed up to 24-month period follow up after initial treatment. For data analysis Microsoft Excel and IBM SPSS 28.0 were used.

Results. The median age of the patients was 65.3 ± 14.5 years. After first initial brachytherapy session 46.2% of patients had positive dynamics in tumor height (≥ 1.0 mm decrease), 15.4% had no dynamics in tumor height (< 1.0 mm increase or decrease) and 38.4% had negative dynamics (≥ 1.0 mm increase) in tumor height. Six patients (33.3%) were assigned to secondary brachytherapy after average of 45.5 months due to negative tumor dynamics. Two patients had enucleation due to aggressive tumor growth. Wilcoxon test showed no statistically significant differences between tumor height before and after first brachytherapy ($p = 0.695$, $p > 0.05$). Meanwhile, differences in tumor height before and after secondary brachytherapy were statistically significant ($p = 0.043$, $p < 0.05$). 69.2% showed decrease in visual acuity after first brachytherapy. Wilcoxon test showed no statistically significant differences between visual acuity before and after first brachytherapy ($p = 0.099$, $p > 0.05$).

Conclusions. Ruthenium-106 applicator brachytherapy shows positive effects in tumor height reduction and/or high constancy in up to 24-month period. Decrease in visual acuity is common complication of ocular brachytherapy.

ANALYSIS OF OPHTHALMIC COMORBIDITIES IN PATIENTS WITH CHRONIC OPEN-ANGLE GLAUCOMA SURGERY

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Keywords. Chronic open-angle glaucoma; Glaucoma surgery; ophthalmic comorbidities

Objectives. Chronic open-angle glaucoma (COAG) is an ophthalmic disorder that is associated with elevated intraocular pressure, which can result in irreversible optic nerve damage and if left untreated can lead to blindness. This study aims to investigate how many patients with surgical treatment of COAG previously had ophthalmic comorbidities, that possibly could be associated with the development and progression of glaucoma.

Materials and Methods. In a retrospective study 34 COAG patients with surgical glaucoma treatment performed between January 2018 and December 2022 were analyzed with such ocular pathologies as hypermetropia, myopia, retinal dystrophy, keratopathy, chronic uveitis and diabetic retinopathy or maculopathy. Also any previous eye surgeries were evaluated, most common were glaucoma surgery, cyclodiathermy, cataract surgery, laser photocoagulation and retinal ablation. Statistical analysis was performed using Microsoft Excel.

Results. In this study data about ophthalmic comorbidities of 34 patients – 14 males and 20 females with ratio 7 to 10 were analyzed. The median age of patients was 72.5 (IQR = 64.0–77.0). Every patient had at least one ocular pathology. 22 patients (64.7%) previously had an ophthalmological surgical intervention, as well 22 patients (64.7%) had retinal dystrophy. 8 patients (23.5%) were diagnosed with myopia, but only 2 patients (5.9%) with hypermetropia. There were 5 (14.7%) patients with keratopathy and 2 patients (5.9%) with chronic uveitis. However, diabetic retinopathy or maculopathy was diagnosed in 3 patients (8.8%).

Conclusions. In conclusion, most patients undergoing glaucoma surgery previously had some kind of ocular surgical intervention (64.7%). Retinal dystrophy has been also frequently present (64.7%). Since all patients before COAG surgery had at least one ocular pathology, ophthalmic comorbidities may play a role in the development of glaucoma and the necessity for surgery could be minimized by reducing and treating other ophthalmological disorders.

HYPERTENSIVE RETINOPATHY CHARACTERISTIC FUNDUS CHANGES AND BLOOD PRESSURE EVALUATION IN DIABETES PATIENTS

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Keywords. Hypertensive retinopathy; diabetes mellitus; fundus photography.

Objectives. Hypertension is common in patients with diabetes mellitus and remains a significant medical and social problem, causing end-organ damage and represents a major financial burden for healthcare. We conducted this study to evaluate the blood pressure and its caused changes in fundus among type 1 (T1D) and type 2 (T2D) diabetes patients.

Materials and Methods. A single-centre prospective cross-sectional study included 113 eyes of 113 patients (74.3% female; median age 66.0 (51.0–72.0) years; median diabetes duration 15 (6.0–22.0) years). The patients with T1D (31.9%) and T2D (66.4%). The subjects were divided in to two groups: 53 patients with controlled (systolic < 140 and diastolic < 90 mmHg) and 60 patients with uncontrolled (systolic > 139 and diastolic > 89 mmHg) hypertension. Fundus photo was taken with Canon CR-2 PLUS AF camera. Hypertensive retinopathy was classified according to Wong- Mitchell and Keith-Wagener-Barker classification. Arteriovenous crossing changes- Gunn's, Salus's and Bonnet's signs- were evaluated. Statistical analysis was performed using Rstudio: Kruskal-Wallis, Wilcoxon, Fisher, Chi-square test.

Results. Controlled hypertension was found in 46.9% patients (T2D 62.3%), median age was 62.0 years (46.0–71.0), median diabetes duration was 14.0 years (7.0–22.0). Uncontrolled hypertension was found in 53.1% patients (T2D 72.4%), median age 68.0 (53.0–72.0) years, median diabetes duration 15.0 (5.8–22.3) years. Hypertensive retinopathy was found in 40 patients in the controlled and 49 in the uncontrolled hypertension group. There was a significant difference between the groups without DR and with DR in controlled hypertension group ($p = 0.029$) and in the uncontrolled hypertension group ($p = 0.0037$). In the uncontrolled hypertension group systolic blood pressure was higher in the group with positive Gunn's sign ($p = 0.025$).

Conclusions. Our data revealed that 53.0% diabetes patients had uncontrolled hypertension and 78.8% had signs of hypertensive retinopathy. Hypertension in diabetes patients is poorly controlled and characteristic changes can be seen in fundus.

SELECTIVE LASER TRABECULOPLASTY (SLT) AS ALTERNATIVE TREATMENT FOR PATIENTS WITH GLAUCOMA

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Keywords. Selective laser trabeculoplasty (SLT); Glaucoma; Intraocular pressure (IOP)

Objectives. The purpose of the study was to evaluate SLT procedure as alternative treatment to eye drops in patients with glaucoma.

Materials and Methods. This retrospective study included 23 medical records of patient's eyes who visited ophthalmologist in Solomatin eye center in the period from June 2022 to December 2022. Inclusion criteria were patients with diagnosed glaucoma and receiving SLT procedure in the last 6 months. Each patient underwent IOP measurement before SLT, 1 week to 1 month after SLT and 3 to 6 months after SLT procedure and were divided into 3 groups according to eye pressure measurements. Data were analysed using MS Excel and IBM SPSS 27. Difference between groups were evaluated by Paired Samples T – Test and Sign test.

Results. Data were obtained for 35 eyes from 23 patients. 52% of patients (n = 12) were male. 48% of patients (n = 11) were female. The mean age was 65 (S 13.5) years with range from 40 to 86. There was highly statistically significant difference ($p < 0.001$) in IOP between two groups – before SLT and after 1 week to 1 month after SLT. Effect size was medium (Cohen's $d = 0.71$). Also, statistically significant difference ($p = 0.009$) was found between IOP after 1 week to 1 month and 3 to 6 months after SLT. Study have demonstrated the IOP reduction in 22 eyes (63%), in 7 eyes eye pressure increased (20%) and in 6 eyes eye pressure did not demonstrate change. Study resulted with IOP reduction of 12%.

Conclusions. Significant results were observed in IOP reduction after SLT procedure. Selective laser trabeculoplasty is an effective alternative to drops used in glaucoma treatment. This procedure can be offered for patients with glaucoma to lower IOP and reduce further visual field progression and optic nerve damage.

CHANGES IN TEAR FILM OSMOLARITY AFTER INTRAVITREAL ANTI-VEGF INJECTIONS

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Keywords. Intravitreal ANTI-VEGF injections. Osmolarity. Cataract surgery.

Objectives. Intravitreal ANTI-VEGF injections are invasive procedures during which ophthalmologists are using anesthetic, antiseptic eye drops and mechanically irritating eye structures. This manipulations can cause tear film osmolarity changes, activate tear film aqueous layer secretion in lacrimal glands. Cataract surgery in anamnesis may effect on tear film osmolarity recovery after ANTI-VEGF injections.

Materials and Methods. The retrospective study about evaluation of tears film osmolarity for the group consisted of 22 patients 32% (n = 7) men, 68% (n = 15) women with an average age of 70.82 [44;93] years, who received intravitreal injection of ANTI- VEGF (Bevacizumab 0.05 mL) in one of the eyes at the Pauls Stradiņš Clinical University Hospital. Patients had no symptoms of dry eye syndrome. Osmolarity was measured in both eyes before injection, 60 min, 120 min after. Patients were divided in two groups: First, patients who previously undergone cataract surgery, second, patients with no history of cataract surgery. Tear film osmolarity was measured by Tearlab Osmolarity System. Data was analyzed with the help of MicrosoftExcel.

Results. Intravitreal injection was performed 63.6%(n = 14) in right eye, 36.4%(n = 8) in left eye. 27.3% Injectable eye and 27.3%(n = 6) intact eye previously received cataract surgery. Patients with cataract surgery before procedure had osmolarity in average 1.36 mOsm/L higher than without surgery. Intact eye with cataract surgery before procedure osmolarity was in average 5.11 mOsm/L higher than without surgery. 60 min after injection osmolarity decreased on 6% in both groups. In 120 min osmolarity become 3%(eyes with surgery) and 2%(eyes without surgery) less than initial. Intact eyes after 60 min decreases osmolarity on 1% and didn't change after 120 min.

Conclusions. During procedure tear film osmolarity decreased, but in a small amount of time osmolarity goes back to initial value. Before injection eye with previous cataract surgery has higher osmolarity, but there is no valuable difference in tears film osmolarity recovery after injection. Non-injectable eye decreases osmolarity, but not significantly.

EFFECT OF OCULAR DIGITAL MASSAGE ON INTRAOCULAR PRESSURE AFTER SINUS TRABECULECTOMY

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Keywords. Ophthalmology; Glaucoma; Eye pressure; Cataract; Lens condition; Post-surgery

Objectives. In the postoperative period after glaucoma surgery, there are disorders of intraocular fluid drainage caused by wound adhesion, postoperative inflammatory processes, and blood elements that block the newly formed outflow pathways. In such cases, in order to reduce the intraocular pressure, an eye massage is performed – by pressing on the edge of the filtration pad and thus contributing to an increase in eye pressure – until the eye pressure normalizes to 16 mmHg. The aim of the study was to analyze how many times it is necessary to repeat the eye massage until the intraocular pressure stabilizes.

Materials and Methods. A retrospective, descriptive and analytical study, included 34 patients in after sinus trabeculectomy operation in time period from 09.10.2018–20.12.2022. Patients were divided into groups depending on intraocular pressure before surgery: $T \leq 35$ mmHg and $T \geq 34$. Also, patients were divided into groups: before cataract surgery and after cataract surgery. The relationship between the established patient groups and the number of eye massages was studied using Spearman's correlation coefficient and Mann-Whitney U test.

Results. The results revealed that there is no significant correlation between the number of massages performed in the groups, neither for the right eye TOD ($r = 0.043$; $p > 0.05$) nor for the left eye TOS ($r = 0.237$; $p > 0.05$). The Mann-Whitney-U test also showed non-significant differences between the number of times of eye massage in groups of pos-operative cataracts ($N = 17$; mean rank = 16.94) and pre-operative cataracts ($N = 17$; mean rank = 18.06).

Conclusions. No association were found between the groups formed and the number of eye massages. Perhaps larger study groups, or evaluation of other possible influencing factors, for example, glaucoma risk factors, could produce different results.

EFFECTS OF TRABECULECTOMY ON VISUAL ACUITY

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Keywords. Trabeculectomy; Visual acuity; Intraocular pressure

Objectives. Trabeculectomy can be used to treat glaucoma by reducing intraocular pressure quickly and effectively. A rapid reduction of intraocular pressure may influence visual acuity. This study was aimed to study the effects of trabeculectomy on visual acuity.

Materials and Methods. This is a retrospective study conducted through analysis of the medical records of 34 patients, who had a trabeculectomy from 2018 to 2022 at the PSKUS Hospital. 34 patients were tested for visual acuity the day before, the day after trabeculectomy. 11 patients were also tested for visual acuity a year after trabeculectomy. Valid patient data was collected and arranged with Microsoft Excel. Data analysis was done with IBM SPSS Statistics.

Results. In this study, the average age of patients is 70.265 years old. The patient's pre-operative visual acuity ranged from worse than the big "E" to 1.0. There was not a statistically significant difference between visual acuity the day before and after surgery (Nonparametric test, $P = 0.754$) or the day before surgery and one year after surgery (Nonparametric test, $P = 0.344$). There was not a statistically significant correlation between changes in visual acuity and intraocular pressure one day after surgery (Nonparametric correlation, $P = 0.422$) or changes in visual acuity and intraocular pressure one year after surgery (Nonparametric correlation, $P = 0.457$). 10 patients had cataract surgery within one year of trabeculectomy. There was not a statistically significant difference between visual acuity the day before and one year after both surgeries (Nonparametric test, $P = 0.727$), and no statistically significant correlation between changes in visual acuity and intraocular pressure one year after both surgeries (Nonparametric correlation, $P = 0.493$). 17.647% of patients had improved visual acuity the day after trabeculectomy, 50.000% one year after trabeculectomy, and 62.500% one year after both surgeries. 70.588% of patients had no change in vision acuity the day after trabeculectomy, 27.272% one year after trabeculectomy, and 10.000% one year after both surgeries.

Conclusions. Trabeculectomy had no significant effect on visual acuity. Changes in intraocular pressure had no significant effect on visual acuity. More patient data is needed to confirm these conclusions.

EVALUATING NON-OPHTHALMIC COMORBIDITIES IN PATIENTS UNDERGOING CHRONIC OPEN-ANGLE GLAUCOMA SURGERY

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Keywords. Chronic open-angle glaucoma surgery; Comorbidities; Chronic diseases

Objectives. Chronic open-angle glaucoma (COAG) is characterised by progressive optic nerve atrophy. COAG is the second most frequent cause of blindness worldwide. The aim of our study was to evaluate glaucoma patient profiles, which includes comorbidities excluding ocular pathologies.

Materials and Methods. A retrospective study was performed in 34 COAG patients who underwent glaucoma surgery between January 2018 and December 2022. We analysed different preoperative profile characteristics such as primary arterial hypertension, diabetes mellitus (including type 1 and 2), hypothyreosis, a previous hepatitis A infection, pulmonary arterial hypertension and previous non-ophthalmic surgeries. Data analysis was done with Microsoft Excel. Data were presented as medians with the interquartile range (IQR, 25%–75%).

Results. Out of 34 patients, 13 (38.2%) of them have reported no non-ophthalmic pathology or surgery. The median age was 72.5 (64.0–77.0) and a male to female ratio was 7 to 10. Primary arterial hypertension was observed in 12 patients (35.3%). Diabetes mellitus, including both type 1 and 2 diabetes has been present in 5 patients (14.7%) and 4 of them were insulin dependent. Only 3 patients (8.8%) had hypothyroidism and also 3 patients (8.8%) had a previous hepatitis A infection. In 7 patients (20.5%) previous non-ophthalmic surgeries were done. Only 1 patient (2.9%) had previously been diagnosed with pulmonary arterial hypertension. In 9 patients (26.5%) at least 2 analysed factors were found and the most frequent combination was primary arterial hypertension and diabetes mellitus, observed in 3 patients (8.8%).

Conclusions. Based on our data analysis, we conclude that in the majority of COAG patients (61.8%) at least 1 comorbidity was observed. Proportion of patients with at least 2 comorbidities was 26.5%. The presence of these comorbidities in patients could be an indicator of both higher intra and post-operative complications.

PRIMARY OPTIC NERVE SHEATH MENINGIOMA: A CASE REPORT

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Keywords. Primary optic nerve sheath meningioma; Benign tumor

Introduction. Primary optic nerve sheath meningiomas (ONSMs) are rare benign slowly growing tumors. However, they can cause visual dysfunction – decreased visual acuity, impaired color vision, visual field defects.

Case Description. A 20-year-old female patient presented with slowly progressive visual loss of her left eye. A complex ophthalmic examination was performed. The best corrected visual acuity in the both eyes was 1.0. Her visual field examination using automated perimetry showed normal visual field of the right eye and inferior scotoma in the left eye. Palpebral fissures were symmetric. Ductions were full. There was a left relative afferent pupillary defect. Fundoscopy showed swollen pale left optic disc. Magnetic resonance imaging tomography revealed the left optic nerve sheath meningioma of the intraorbital segment. Since the best corrected visual acuity was not reduced, follow-up was recommended.

Summary. ONSMs are benign tumors of the anterior optic pathway. We report a case of unilateral damage to the optic nerve associated with primary optic nerve sheath meningioma which caused visual disturbances.

Conclusions. Because of their location ONSMs can cause severe visual problems. The diagnosis and management are based on clinical presentation and neuroimaging.

ENDOVASCULAR THROMBECTOMY IN PATIENTS AGED 80 YEARS OR OLDER WITH ACUTE ISCHEMIC STROKE (AIS) – TECHNICAL AND CLINICAL OUTCOMES

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Keywords. Endovascular thrombectomy; Acute ischemic stroke; Interventional radiology

Objectives. To study the technical and clinical outcomes of endovascular thrombectomy using the thrombolysis in cerebral infarction (TICI) scale, Modified Rankin Scale (mRS) and NIH stroke scale scores in patients over 80 years with acute ischemic stroke compared to patients in the age group under 80 years.

Materials and Methods. A total of 318 patients with AIS who underwent endovascular thrombectomy in Pauls Stradiņš Clinical University Hospital during the period of time from 2020 to 2021 were included in this retrospective cohort study. All patients were divided into two groups based on their age: patients who were aged under 80 (235) and who were aged 80 and above (83). In this study, the statistical analysis of clinical and technical outcomes of both groups measured by 3 scales (NIHSS, mRS and TICI) were performed using IBM SPSS.

Results. There was a significant difference between the two groups in terms of pre- and postoperative NIHSS value ($p = 0.045$) and no significant difference between two groups in terms of pre- and postoperative mRS score ($p = 0.113$). TICI score wasn't significantly different between the two groups ($p = 0.241$). The mortality rate after endovascular thrombectomy is higher in elderly patients (> 80 years) 19.28% compared to younger patients (< 80 years) 11.91%.

Conclusions. The findings of this study show that the impairment caused by an AIS which is quantified with NIHSS is more severe after endovascular thrombectomy in elderly patients (> 80 years) than in younger patients (< 80 years). The technical outcomes characterised by TICI score are not significantly different between the two age groups. Disability in patients who have suffered an AIS measured by mRS is not significantly different between the two age groups.

COMPARISON BETWEEN LAPAROSCOPIC AND OPEN INGUINAL HERNIA SURGERY TENDENCIES IN ADULTS

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Keywords. Inguinal hernia; Laparoscopic

Objectives. Inguinal hernias are widely reviewed in modern medicine. Laparoscopic methods are becoming more acceptable, they provide fewer complications for patients and improve working capacity compared to open surgery. Our aim is to compare tendencies of open and laparoscopic inguinal hernia repair surgeries, it's correlation with age, gender of patients in Lithuania in 2015–2020.

Materials and Methods. We collected the total number of open and laparoscopic inguinal hernia surgeries in adults from 2015 to 2020 in Lithuania. Patients were divided into groups according to gender and age: 18–44 years, 45–64 years, and 65+ years. Data was collected from the Health Information Center. Statistical methods – using Mann-Whitney U test.

Results. Average number of laparoscopic surgeries performed on men was $92.74 \pm 0.71\%$, $7.26 \pm 0.71\%$ on women. The number of open surgeries men $90.36 \pm 0.53\%$, women – $9.82 \pm 0.74\%$. Number of surgeries from 18 to 44 years: laparoscopic – $25.21 \pm 1.85\%$, open surgeries – $16.33 \pm 0.98\%$. From 45 to 64 years: laparoscopic – $49.22 \pm 1.16\%$, open surgeries – $42.03 \pm 0.49\%$. 65+ years: laparoscopic – $26.0 \pm 1.41\%$, open surgeries – $41.31 \pm 0.79\%$. There is a visible increase in the number of open surgeries which correlates with increasing age ($p < 0.05$). Gender had no significant effect. From 2015 to 2019, the number of laparoscopic surgeries increased from 1,137 to 1,856, in 2020, the number decreased to 1,351. From 2015 to 2019, the number of open surgeries increased from 4,525 to 4,921, in 2020, the number decreased to 3,346. The declining figures for 2020 indicate the suspension of scheduled procedures due to the COVID-19.

Conclusions. Aging of patients positively correlates with the increasing number of open surgeries. By 2019, the number of laparoscopic and open surgeries was growing. COVID-19 impacted the reduction of laparoscopic and open surgeries in 2020.

PREVALENCE OF POSTOPERATIVE WOUND INFECTION PATHOGENS AFTER ABDOMINAL SURGERY IN LITHUANIA IN 2011–2021

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Keywords. Wound infection; Microorganisms; Postoperative

Objectives. Postoperative wound infection remains a major public health problem. Wounds become infected when bacteria colonize the wound. Postoperative wound infection increase patient's morbidity and mortality, as well as length of hospital stay. The aim of this study is to determine the prevalence of postoperative wound infections during different abdominal surgical interventions in Lithuania from 2011 to 2021.

Materials and Methods. The retrospective study was conducted by reviewing statistical records of 19563 patients who had undergone abdominal surgery from 2011 to 2021 in Lithuania. The patients were divided into 3 groups: appendectomy, cholecystectomy and colon surgery. The three most common infectious agents are included in the results. Data was collected from the Health Information center of the Institute of Hygiene, calculated from the National Health Insurance Fund under the information system SVEIDRA of the Ministry of Health of Lithuania. Data was processed by Microsoft Excel.

Results. After appendectomy, 2.9% of patients developed surgical wound infection. Microbiological culture tests were performed in 53.2% of patients with an infection. Microorganisms identified: *E. Coli* 69.88%, *Bacteroides* spp. 21.69%, *Streptococcus* spp. 12.05%. After cholecystectomy, 0.68% patients developed surgical site infection. Microbiological culture tests were performed in 55.56% of patients. Microorganisms identified: *Enterococcus* spp. 28.57%, *E. Coli* 22.86%, *Klebsiella* spp. 17.14%. After colon surgery, 11.83% patients developed surgical wound infection. Microbiological culture tests were performed in 97.8% patients with an infection. Microorganisms identified: *E. Coli* 37.85%, *Enterococcus* spp. 35.31%, *Klebsiella* spp. 11.86%.

Conclusions. *E. Coli* was the most commonly detected microorganism between three surgical groups. It is important that microbiological culture tests should be performed for each identified wound infection. Consequently, more accurate epidemiological data could be collected. Therefore, we recommend to perform more microbiological culture tests for patients with wound infection.

TREATMENT OF ENDOBRONCHIAL TUMORS USING CRYOTHERAPY (CRT)

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Keywords. Cryotherapy; Endobronchial tumor; Lung cancer, Bronchoscopy

Objectives. Cryotherapy is used for ablation of endobronchial lesions by the application of low temperatures. Due to versatility and safety cryotherapy gains popularity, albeit there is still limited scientific evidence of its efficiency. Cryotherapy was introduced in Latvia in 2018, which allowed us to analyze efficacy and outcomes of procedures performed over a 4-year period.

Materials and Methods. This retrospective single-center study included patients with endobronchial lesions of different origins (ICD- 10 diagnoses: C34,C78.0,D14,D38.1). Patients underwent computed tomography and combined rigid/flexible bronchoscopy with cryotherapy using ERBECRYO cryoprobe. After initial assessment patients were divided into localized disease group (LDG) and advanced disease group (ADG), patients with extensive tumor spread or/and lack of predicted cryotherapy benefit were excluded. The remaining patients had repeat cryotherapy procedures and follow-up with assessment using adapted RECIST criteria (CR – complete response, PR – partial response; PD – progressing disease) and ECOG performance status. Descriptive and analytical statistics (t-test) were used for data processing (SPSS software).

Results. Between July 2018 and July 2022, 33 eligible patients were enrolled. 70% of patients were male (n = 23), mean age was 64.5 ± 14.4 years. There were 16 patients in LDG group (56% lung cancer, 44% benign lesions) and 17 patients in ADG group (76% lung cancer, 24% secondary malignancy). The average number of cryotherapy procedures was 2.5 ± 0.6 . ECOG performance status improved after the cryotherapy procedure in both groups: from 0.8 ± 0.8 to 0.4 ± 0.6 (LDG) and from 1.9 ± 0.7 to 1.3 ± 0.6 (ADG) ($p < 0.001$). In LDG group 87.5% of patients had CR and 12.5% had PR ($p < 0.001$), but in ADG group 76.5% had PR and 23.5% PD ($p < 0.001$). There were six Grade 1 and two Grade 3 adverse events.

Conclusions. Cryotherapy represents a minimally invasive technique which can be used for the radical treatment of localized endobronchial tumors including lung cancer. Cryotherapy has limited effect in case of advanced disease but has the potential to improve symptom control and quality of life.

HYBRID AORTIC SURGERY IN GEORGIA, COLLABORATION BETWEEN CARDIAC AND ENDOVASCULAR SURGEONS

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Keywords. Aorta; Hybrid surgery; Debranching; Aortic dissection; SCD-Sudden cardiac death

Objectives. Aortic dissection is a life-threatening condition in which a small tear causes the walls of the aorta to split apart. The management of patients with aortic dissection is challenging and its treatment is an area of development and innovation. Conventional surgical techniques are associated with significant risks in terms of mortality and morbidity in such high-risk patients. As a result of cumulative advances in technology, classical surgical techniques have been improved and enhanced by the newer endovascular approaches, hybrid procedures.

Materials and Methods. The N.Bokhua memorial cardiovascular center. Demographic Data: Patients N – 79; 42 hybrid intervention; 25 traditional approaches and 12 endovascular INV. Ages–41–92 y.old. Sex – 90% Male. Concomitant diseases – 67%. Heart ischemic diseases – 45%. T.K.U – 16%. Without symptoms 40 (4)%. Symptoms – 5–60%. Aortic aneurysm – (35–89 mm). This data encompasses statistical analysis of patients with aortic aneurysms and its treatment techniques, results and outcomes, the study period was from 2019 to 2022. The research was conducted with informed written consent from the patients to share their medical history.

Results. The study showed a 95% success rate with 2.7% complications and 2 cases of hospital mortality due to SCD. No endoleak was reported, with 4% of deaths after discharge and 2–3% due to concomitant diseases. The hybrid procedure may be a viable option for patients facing an inappropriate risk with conventional arch surgery. Our clinical experience suggests that the hybrid procedure may serve as a viable treatment option for selected patients who face an inappropriate risk with conventional arch surgery

Conclusions. The study evaluated the outcomes of hybrid aortic debranching surgery for patients with aortic aneurysms and dissection. Results showed a technical success rate of 95%, a low incidence of complications (2.7%), and hospital mortality 2 cases. The procedure showed potential as a safe and effective alternative to conventional arch surgery in high-risk patients. The results contribute to the growing evidence of hybrid aortic debranching surgery as a treatment option.

MINIMALLY INVASIVE AORTIC VALVE REPLACEMENT – COMPARISON OF THORACOTOMY AND PARTIAL STERNOTOMY

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Keywords. Minimally invasive cardiac surgery; Minimally invasive aortic valve replacement; Right anterior thoracotomy; Partial lower sternotomy; Aortic valve stenosis; Aortic valve replacement

Objectives. Aortic valve replacement (AVR) is the most performed heart valve surgical procedure globally. There is an ever-increasing demand for cardiac surgery to become less invasive, especially with the introduction of transcatheter heart valve therapies. The objective of this study was to compare results after surgery for AVR using a new technique, right side antero-lateral minithoracotomy (RT), with two standard techniques, partial lower sternotomy (PS) and full sternotomy (FS).

Materials and Methods. This was a retrospective study of all patients operated at a single center between 2018–2021. All patients underwent elective isolated AVR surgery using the RT, PS or FS approach 21, 24 and 22 patients respectively. Patients' demographics, clinical, operative and early postoperative data were compared.

Results. Longer overall operative times were observed in the RT group comparing to PS and FS ($p < 0.001$). Median operative time (minutes) for RT, PS and FS groups were 210 (Q1;Q3 190–228), 150 (Q1;Q3 150–178) and 145 (Q1;Q3 130–168). RT patients had a tendency towards shorter ICU stay ($p = 0.296$), and less postoperative blood loss ($p = 0.061$). No in-hospital mortality was observed and hospital stay was similar between the groups. There was lower systemic inflammation reaction in the RT group, observed by lower postoperative CRP levels ($p = 0.025$). Median CRP(mg/dL) for RT, PS and FS groups were 32 (Q1;Q3 26–52), 58(Q1;Q3 34–70) and 62 (Q1;Q3 40–94).

Conclusions. This study indicates that both RT and PS are safe and effective operative approaches for AVR, even during the early implementation phase. Although operative times for patients in the RT group were longer, they demonstrated a significantly lower inflammatory response measured by CRP levels and a tendency towards shorter ICU stay and less blood loss suggesting a measurable benefit for the mini-invasive approach.

EFFECTS OF AGE ON FAT GRAFTING

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Keywords. Fat grafting; Liposuction; Aging

Objectives. Complications after fat grafting (FG) persist to this day. One of the most important factors for successful FG is to maximize adiposity mass (AM) obtained and to minimize oil mass (OM) during liposuction. In the last decade, only a few studies have examined the effect of age on AM and OM and found no association. The aim of this study was to investigate the effect of age on fat parameters obtained during liposuction.

Materials and Methods. The prospective study included 50 women who underwent abdominoplasty with abdominal skin flap removal and vibro-assisted liposuction in Kaunas private clinic in 2022. Inclusion criteria were age between 30 and 60, no co-morbidities or harmful habits. Parameters such as age and body mass index (BMI) were included. A total of 100 fat tubes were collected. Enzymatic isolation and centrifugation methods were used and samples were separated into the upper OM, the middle of AM and a lower fraction of water. After obtaining the weight of each fraction, the water was removed from the calculations. Using GraphPad Prism 9 software Spearman correlation coefficient was used and for descriptive statistics, median values (min-max) were calculated.

Results. The median age was 41.5 (31–60) years. The median AM was 81.08 (45.13%–97.5%) and the median of OM was 18.9% (2.5%–54.87%). Median BMI was 30.57 (23.4–33.6). There was a negative moderate statistically significant correlation between age and AM (-0.4132 $p = 0.0029$). There was a passive moderate statistically significant correlation between age and OM (0.4132 $p = 0.0029$). A positive very weak statistically not significant correlation was found between BMI and age (0.2401 $p > 0.05$).

Conclusions. Younger age may be associated with higher AM. Older age may be related to higher OM. Higher AM and lower OM mass increase the likelihood of good FG, so we assume that FG is most effective at a younger age.

ACUTE TYPE A AORTIC DISSECTION IN PATIENTS WITH AORTIC ECTASIA PRIOR TO THE EVENT: SHOULD WE RECONSIDER THE CURRENT GUIDELINES

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Keywords. Ascending aorta; Acute type A aortic dissection; Aortic ectasia

Objectives. Majority of patients prior to acute type A aortic dissection have normal aorta or ectasia which is dilatation of less than 50% of normal aorta diameter. Current guidelines suggest ascending aorta replacement only in cases where aorta is > 5.5 cm in patients without other risk factors. This study aimed to assess prevalence of ascending aorta ectasia and extent of it prior to the event of acute type A aortic dissection.

Materials and Methods. We examined CT findings of 73 consecutive patients with acute type A aortic dissection who were surgically treated in our institution from year 2019 to year 2022. Prior CT scans for various reasons before the acute event was found in 22 patients comprising the study population. The measured diameter of ascending aorta was compared with predicted value based on age, sex and BSA to determine the extent of dilatation.

Results. Mean age of study population was 62.9 ± 12.3 years and 14 (63.6%) were male. Aneurysm prevalence was 27.3% corresponding to 6 patients. Normal aorta diameter was seen in 3 (13.6%) cases. In 13 (59.1%) cases aortic ectasia was evident, however not reaching the threshold of surgical intervention. Mean expected to observed aortic ratio in the study population excluding patients with aneurysm was 1.20 ± 0.14 and diameter of aorta 41.4 ± 4.83 mm.

Conclusions. Our study confirmed that the majority of aortic dissections occur to patients with ectatic aorta without reaching surgical intervention threshold. Further investigation with larger patient sample would be necessary to suggest reconsidering the criteria for elective ascending aorta replacement.

ECHOCARDIOGRAPHIC STUDY OF PULMONARY VALVE STENOSIS AND REGURGITATION IN PATIENTS WITH TETRALOGY OF FALLOT BEFORE AND AFTER CORRECTION

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Keywords. Tetralogy of fallot; Right ventricle outflow tract; Pulmonary valve insufficiency

Objectives. To study the correlation between Right Ventricle Outflow Tract (RVOT) Gradient Pressure and Pulmonary Valve insufficiency before and after correction of Tetralogy of Fallot.

Materials and Methods. This study is based on an evaluation using a retrospective cohort study of 95 patients results with correction of Tetralogy of Fallot from the Timofei Moșneaga Republican Clinical Hospital and a literature review of related articles The statistical analysis was performed using Microsoft Excel.

Results. Pulmonary valve stenosis in Tetralogy of Fallot (TOF) causes a high Right Ventricle Pressure, which is solved by corrective surgery. Correction of TF on the other hand causes pulmonary valve regurgitation. Based on a research of 95 patients who had corrective surgery, it was identified that before surgery 91 (95.79%) patients had a RVOT GP > 60 (severe stenosis), 4 (4.21%) had a GP between 30–60 (moderate stenosis) and 0 patients had GP < 30 (mild stenosis), with a total mean of 80.62 mmHg. After surgery there were 82 (86.32%) patients with RVOT GP < 30 (mild stenosis), 10 (10.53%) had a GP between 30–60 (moderate stenosis) and 3 (3.16%) had a GP > 60 (severe stenosis), with a mean of 27.19 mmHg. There was a 66.27% decrease of RVOT GP in patients after surgery. Regarding the grade of regurgitation, before surgery 62 (64.58%) had no regurgitation, 26 (27.37%) had mild, 6 (6.32%) had moderate and 1 (1.05%) had severe regurgitation. After surgery only 1 (1.05%) patient had no regurgitation, 7 (17.9%) had mild, 44 (46.31%) had moderate, and 33 (34.74%) had severe regurgitation, of them 85 (89.47%) developed a more severe grade of regurgitation.

Conclusions. Correction of ToF decreases by 66.27% the Right Ventricle Outflow Tract GP, but increases Pulmonary Valve Regurgitation by 89.47% that might require corrective surgery in the future.

UNCOVERING THE LINK: ARE SARCOPENIA AND MYOSTEATOSIS PREDICTORS OF URINARY INCONTINENCE AFTER LAPAROSCOPIC RADICAL PROSTATECTOMY?

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Keywords. Prostatectomy; Sarcopenia, Psoas muscle index

Objectives. Urinary incontinence (UI) is a common complication after laparoscopic radical prostatectomy (LRP). The only study considering the influence of average total psoas density (ATPD) and psoas muscle index (PMI) on UI after radical prostatectomy, based on the Asian population states that sarcopenia defined by psoas-muscle-index (PMI) has no correlation with UI, while myosteatosis expressed by average total psoas density (ATPD) corresponds with UI incidence. Regarding the differences concerning the population and surgical method used in the mentioned study, we aim to evaluate the impact of ATPD and PMI on UI after LRP in the European population.

Materials and Methods. The study is a retrospective analysis of 37 patients from 50 to 80 after LRP in the Department of the Urology and Urological Oncology of Medical University of Lublin, Poland. We analyzed computed-tomography (CT) scans at L3 level performed before LRP, patients' age, height and body-mass-index (BMI). CT measurements were expressed with Hounsfield Units and cross-sectional area of psoas muscles, corresponding with ATPD and PMI respectively. The severity of UI 1, 3, 6, 12 months after LRP was expressed by the number of incontinence pads used every day.

Results. Logistic regression analyses demonstrate a significant statistical correlation between PMI and UI rates 3 and 6 months after the procedure ($p = 0.013$ and $p = 0.020$). However, no prominent impact of PMI is observed 1 and 12 months after surgery. ATPD does not emerge to be significantly associated with UI either 1, 3, 6 or 12 months after LRP. Moreover, there is no detected statistical correlation between BMI, patient's age, height and UI.

Conclusions. The analysis contrasts with previous publications. Sarcopenia influences the UI incidence after LRP and is dependent on PMI, which could be a crucial factor in determining surgical treatment.

CORRELATION OF PREOPERATIVE SERUM CALCITONIN WITH LYMPH NODE METASTASIS AND TUMOR SIZE IN MEDULLARY THYROID CARCINOMA

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Keywords. Medullary thyroid cancer; Calcitonin

Objectives. Medullary thyroid carcinoma is one of the rarest thyroid pathologies. In current American Thyroid Association (ATA) guidelines serum hormone calcitonin level in medullary thyroid carcinoma is recommended to use in differential diagnosis and evaluation of treatment response. As other study support serum calcitonin level can as well be a useful biomarker to evaluate carcinoma spread locally and metastatically in order to determine surgical approach. This study aims to evaluate calcitonin correlation with regional lymph node metastasis and tumor size in our population for future adjustment of surgical strategy.

Materials and Methods. From 491 patients operated with malignant thyroid pathology in Pauls Stradiņš Clinical University Hospital, Endocrine Surgery unit between October 2016 and October 2022 histologically approved medullary thyroid cancer was found in 26 (5.3%). Data were analyzed regarding patient age, sex, tumor size, total number of metastatic lymph nodes, TIRADS classification group, TNM classification regional lymph node node stage. Preoperative serum calcitonin data was correlated with these parameters using Spearmans's correlation.

Results. Mean preoperative calcitonin level was 557.3 pg/mL. Data analysis showed that correlation between preoperative calcitonin and tumor size was statistically significant and moderately strong ($r = 0.663$; $p < 0.001$). Furthermore, significant moderately strong correlation was also found between preoperative calcitonin level and lymph node metastasis ($r = 0.670$; $p < 0.001$), as well as calcitonin and regional lymph node stage ($r = 0.564$; $p = 0.017$). Correlation with other factors was not statistically significant ($p > 0.05$).

Conclusions. In our study correlation between preoperative serum calcitonin and tumor size was moderately strong and statistically significant, as well as correlation between calcitonin and metastatic lymph nodes and lymph node stage. Based on results calcitonin can be used as prognostic biomarker to evaluate tumor spread and might be applicable for surgical extent.

EFFECTIVENESS OF SUBPLEURAL CONTINUOUS ANALGESIA AS PART OF MULTIMODAL ANALGESIA STRATEGY IN VIDEO ASSISTED THORACOSCOPIC SURGERY PATIENTS

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Keywords. Video-assisted thoracoscopic surgery; VATS; Subpleural continuous analgesia; SCA; Intercostal nerve block; ICNB

Objectives. There are known debates in the medical community regarding the search for better techniques of postoperative pain management in video assisted thoracoscopic surgery (VATS) patients, specifically, regional analgesia. The gold standard of VATS postoperative pain syndrome management is not established. The objective of this study is to compare up-to-date VATS postoperative pain syndrome management techniques with a technique of choice at the Centre of Tuberculosis and Lung Diseases, Riga East University Hospital. These are subpleural continuous analgesia (SCA) and intercostal nerve block (ICNB) respectively.

Materials and Methods. A randomized prospective study of 18 patients was performed. They were divided into 2 groups: the first group (9 patients) underwent the SCA procedure following VATS; the second group (9 patients) underwent ICNB procedure following VATS. During the first five postoperative days after VATS peak expiratory flow, subjective pain intensity and postoperative period satisfaction were measured and used in the analysis.

Results. Although peak expiratory flow performance difference in favor of ICNB compared to SCA was shown on all five postoperative days, the difference elicited statistical significance only on day three ($t(8) = 3.045$, $p = 0.016$, $d = 1.01$). The mean difference between pain intensity as well as postoperative satisfaction level measured with a modified Likert scale in patients who underwent SCA procedure compared to ICNB during five postoperative days following VATS were statistically insignificantly different from zero.

Conclusions. The hypothesis that the up-to-date technique of SCA after VATS is a more effective analgesic strategy compared to ICNB has failed. The hypothesis that postoperative period overall satisfaction after VATS is better if part of the multimodal analgesic strategy is SCA and not ICNB has failed as well. Further investigation is necessary.

EVALUATION OF EUSOMA QUALITY INDICATORS FOR SURGICALLY TREATED BREAST CANCER

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Keywords. BCS; Breast cancer; EUSOMA; Quality indicators

Objectives. Modern treatment of early breast cancer is complicated and best done in a dedicated multidisciplinary breast center to ensure optimal results in terms of patient survival and quality of life. The aim of this work is to analyze the EUSOMA quality indicators (QI) in surgically treated breast cancer cases in a single breast unit.

Materials and Methods. The study included 322 breast cancer cases who were treated at Paul Stradins Clinical University Hospital (PSCUH) in 2021. 58 parameters, including the stage, molecular subtype and treatment details were collected for each case. Data analysis was performed with EC Initiative on Breast Cancer Quality Assurance Indicator Calculator tool. 10/26 indicators were evaluated in this study.

Results. From 10 QIs analyzed, 8 passed the required threshold. Estrogen, Progesterone receptors, HER2 status before the start of the treatment was collected in 96.1% (QI threshold > 95%). Adjuvant radiotherapy after breast conserving surgery was done in 95.3% (> 90%). In cN0 case sentinel node biopsy was performed in 97.3% (> 90%). DCIS cases, which underwent only one surgery – 97.3% (> 70%). At least 10 nodes were harvested during axillary dissection in 90% (≥ 90%). If pT1, breast conservation was done in 71.8% (> 70%). Proportion of women with HER2+ (N+ or T > 1 cm) cancer treated with neoadjuvant chemotherapy who underwent neoadjuvant anti-HER2 therapy – 93.3% (> 90%). Proportion of surgically treated women with pN0 that did not undergo axillary dissection – 100% (> 80%). For 2 QIs threshold was not met. Proportion of women with locally advanced breast cancer who underwent neoadjuvant systemic therapy – 67.3% (> 90%). Lead time between pathology report with diagnosis of cancer and start of treatment no longer than 4 weeks was observed in 39.3% cases (> 90%).

Conclusions. This study shows that Breast Unit of PSCUH complies with the majority of analyzed QIs. However, shortage of human resources and other factors are probable main causes for non-compliance in number of QIs.

CASE REPORT: SHORT BOWEL SYNDROME AFTER MESENTERIC ISCHEMIA

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Keywords. Short bowel syndrome; Mesenteric ischemia

Introduction. Short bowel syndrome is a hardly manageable malabsorptive disorder as a result of the loss of bowel mass mostly secondary to surgical resection of the small intestine.

Case Description. A 42-year-old woman was admitted to ER with abdominal pain, nausea, vomiting. Patient suffers from hypertension and underwent stroke 10 years ago. The superior mesenteric artery thrombosis was detected on the CT scan angiography. Interventional angiography and thrombectomy was subsequently performed. Next day laparotomy was performed and two long necrotic intestinal segments with impaired blood flow were found. Sufficient blood flow was detected only in proximal 90 cm and separate 60 cm long segment about 2.5 m from lig. of Treitz. Resection of two small intestine segments and two small bowel anastomosis were performed. After a month symptoms reoccurred and patient was referred to ER. Intestinal obstruction was diagnosed. Patient was treated conservatively for 2 weeks, but the symptoms persisted. Patient was operated repeatedly: a stenosed distal ischemic intestinal segment was found and resected. Consequently, enterocolostomy was performed with the 120 cm of small intestine left as a result. In 5 days, the leakage of anastomosis was suspected. Relaparotomy with jejunal resection and jejunoascendostomy were performed with only 70 cm of small intestine left. The patient was recovering in full parenteral nutrition with additional big doses of microelements. In few months, the patient started peroral nutrition with additional parenteric support, her condition eventually improved.

Summary. We presented a clinical case of short bowel syndrome which was caused by mesenteric ischemia. Even after several surgeries with only 70 cm of small intestine left, patient successfully recovered.

Conclusions. Even though, short bowel syndrome is a hardly manageable malabsorptive condition, this clinical case showed that even with 70 cm of small intestine left, the patient is able to live a fulfilling life.

GIANT UTERINE LEIOMYOMA WITH ONE FIBROID: A CHALLENGING CASE USING PFANNENSTIEL INCISION

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Keywords. Large formation; Leiomyoma; Pfannenstiel incision; Hysterectomy; Uterine fibroids

Introduction. Clinicians often consider oncological diseases or include them as one of the differential diagnoses when they see large formations, although this is not always true and this clinical case demonstrates it. Leiomyomas are the most common tumors of the female genital tract. They are estimated to occur in 20% to 50% of women, with increased frequency during later reproductive years. Fibroids are the most prevalent benign tumors of the uterus, arising from the smooth muscle.

Case Description. A 47-year-old female (G1, P1) presented to the obstetrics & gynecology department with complaints of pain and mass in the abdomen for 18 months. During abdominal examination revealed a mass of approximately 24 gestational weeks, arising from the pelvis extending to the hypochondriac region, with restricted mobility and hard in consistency. On per vaginal examination, bilateral fornices were obliterated and the uterus was not felt separately from the mass. On per rectal examination, rectal mucosa was found to be free. During abdominal ultrasonography, one well-defined hypoechoic lesion arising from the uterus was visualized (FIGO classification – Hybrid). The patient was further investigated in Rīga's 1st Hospital and was treated surgically (20.12.22) – lower laparotomy (Pfannenstiel incision), total hysterectomy, bilateral salpingectomy. Histological diagnosis: uterus leiomyoma, no signs of malignancy. There were no complications during and after surgery. Oral, subcutaneous, and intravenous pharmacotherapy followed. Patient was discharged from the hospital on 22.12.22 in overall stable condition with further ambulatory recommendations for a general practitioner and gynecologist.

Conclusions. Massive uterine leiomyomas are incredibly rare. They frequently resemble adnexal mass and radiological investigations are crucial in resolving the diagnostic dilemma. Due to the distortion of the anatomy in such large fibroids, careful dissection requires high surgical skills and anatomical knowledge to prevent damage to nearby tissues and ensure a successful treatment.

TREATMENT METHOD FOR A COMMINUTED FRACTURE OF THE LEFT SCAPULA AND A FRACTURE OF THE STERNAL END OF THE CLAVICLE

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Keywords. Osteosynthesis; Clavicle; Scapula; Dislocation

Introduction. Fractures of the scapula and clavicle are usually simple and treated conservatively with immobilization, however, some complicated cases should include surgical manifestations. Osteosynthesis is a type of reconstructive surgery aimed at stabilizing and joining the ends of a broken bone after a fracture, an osteotomy, or a separation from a previous fracture. We present a rare case of conservative and surgical treatment combination for multiple fractures of the scapula and clavicle.

Case Description. A 54 years old man after an incident with a closet, presented to the hospital with complaints of severe pain in the shoulder joint and deformations of the visual joint. Computed radiography findings revealed a comminuted fracture of the sternal end of the left clavicle with dislocation and fractures of the left scapula acromion, coracoid process, spine of the scapula with dislocations. CT scan findings showed a comminuted fracture of the acromion of the scapula with dislocation, fracture of spine of the scapula without dislocation, fracture of coracoid process without dislocation. A comminuted fracture of the sternal end of the left clavicle with dislocation ventrally, ligament damage of the AC joint, and dislocation of the acromial end of the clavicle cranially were confirmed by the scan. Surgical manifestation was performed. The first surgery included osteosynthesis of the left scapula with 2.7/3.5 locked plate muscle sutures. The second surgery involved an open reposition of the sternal end of the left clavicle, and osteosynthesis with a Hook plate. During the post-surgery period the patient received analgetics, anti-inflammatory drugs. A scarf immobilization for 6 weeks was recommended. Gentle passive movements in the left wrist, left elbow and left shoulder joint were allowed during first 6 weeks post-surgery for 3–4 times a day.

Summary. This study describes a method of surgical treatment (osteosynthesis) of a comminuted acromion fracture with dislocation of the left scapula and a comminuted fracture of the sternal end of the left clavicle with dislocation.

Conclusions. The treatment of comminuted acromion, scapula and clavicle fracture is complicated and requires osteosynthesis of both bones. Such cases have a higher risk of complications, therefore a patient should be carefully observed and treated by well-knowing specialists.

SPONTANEOUS INDIRECT BILATERAL CAROTID-CAVERNOUS FISTULA TREATED WITH ENDOVASCULAR COIL EMBOLIZATION – A CASE REPORT

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Keywords. Bilateral carotid-cavernous fistula; Coil embolization

Introduction. A bilateral carotid cavernous fistula (CCF) is a rare, atypical vascular shunt between the carotid arterial system and the venous channels of the cavernous sinus. Depending on how the internal carotid artery and cavernous sinus communicate, they are categorized as direct or indirect. Bilateral CCFs are rare and seen in 1–2% of patients with CCF. Rarely occurring, bilateral CCFs are detected in 1–2% of CCF patients. The case of a bilateral indirect, non-traumatic, low-flow carotid-cavernous fistula that was effectively treated with endovascular coil embolization is described here.

Case Description. A 62-year-old female with poorly controlled arterial hypertension presented with bilateral eyelid swelling, subacute injection of both eyes, ophthalmoplegia, diplopia, and diminished visual acuity. She had no history of prior head trauma. Arterial flow along the cavernous sinuses was seen during an MRI angiography, which suggests bilateral CCF.

Due to imaging findings and the patient's symptoms, the CCF diagnosis was later verified by digital subtraction angiography (DSA), which revealed bilateral, indirect dural, low-flow CCFs.

Detachable coils were used for endovascular embolization of both CCF, and the carotid-cavernous flow resolved right away after the treatment.

Summary. Spontaneous bilateral CCF should be examined in patients presenting with acute changes in vision, headache, and exophthalmos regardless of the history of trauma, to avoid misdiagnosis and late treatment. DSA is the modality of choice in these cases, as for the MRI it requires a highly experienced neuroradiologist, as the findings usually are quite subtle.

Conclusions. Imaging modalities such as MRI and DSA play a significant role in CCF diagnosis, although DSA is typically necessary both for diagnosis and treatment with endovascular embolization.

COMPLICATED PRIMARY HYPERPARATHYROIDISM. RARE MANIFESTATION, DIFFICULTIES IN DIAGNOSIS AND UNCOMMON POSTOPERATIVE COMPLICATION: A CASE REPORT

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Keywords. Parathyroidectomy; Hyperparathyroidism; Osteitis fibrosa cystica (OFC)

Introduction. Primary hyperparathyroidism (PHPT) manifests as hypercalcemia associated with prolonged exposure of bone to high serum parathyroid hormone (PTH) levels. OFC is a late manifestation of PTH excess and a rare complication of PHPT, affecting less than 2 percent of patients. The only definitive treatment for symptomatic PHPT is parathyroidectomy.

Case Description. A 37-year-old woman was admitted to our surgical clinics for parathyroidectomy with simultaneous total thyroidectomy (December 2021). In October 2021 verified PHPT with severe hypercalcemia (serum calcium – 3.85 mmol/L, PTH – 367 pg/mL) and thyroid nodes with possible follicular atypia (ultrasonographically large nodes in both lobes TIRADS 4a, cytologically TBSRTC IV). Her medical history showed hypercalcemia from 2019 without subsequent diagnostic tests. Later patient had a pathological fracture on the background of osteolytic bone formation in the left femur, radiologically Brown tumors in the vertebrae of the spine, and the left scapula. In the endocrinology department, single photon emission computed tomography (SPECT) and selective venous sampling of PTH were performed, and inconclusive results indicated the *glandula parathyroidea* adenoma localized in the lower pole of the right thyroid gland lobe. During operation 2 intrathyroidal parathyroid adenomas were found. Intraoperative ultrasonography for right cervical exploration was performed- a round hypoechogenic structure next to *a. carotis comunnis dextra* was visualized and extirpated. Intraoperative PTH levels decreased by more than 50% (from 357 to 116 pg/mL). After surgery the patient showed pupillary asymmetry and ptosis on the right side, presumably, a postoperative complication developed- Horner's syndrome. Postoperative histology verified two parathyroid adenomas from nodes that were intimately connected with thyroid lobes, but no data about thyroid nodes has been obtained.

Conclusions. Timely detection of hyperparathyroidism can prevent advanced-stage manifestations like OFC. PHPT diagnosis can be a complicated and incorrect interpretation of examination results can lead to uncommon postoperative complications.

CLINICAL CHALLENGES AND MANAGEMENT OF THE RIGHT FEMUR DISTAL METAPHYSIS PERIPROSTHETIC FRACTURE IN AN ELDERLY PATIENT

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Keywords. Periprosthetic fracture; Joint replacement

Introduction. The rates of primary and revision knee joint replacements are growing due to an aging population, so is the number of periprosthetic fractures. Periprosthetic fractures are a complex trauma to treat due to the poor bone quality in elderly patients and fixation issues due to the prosthetic implants. The purpose of this study is to determine the surgical strategy to minimize the risk of a new fracture and to ensure the highest probability of fracture healing, especially if the patient is uncooperative with non-weight-bearing on the operated leg.

Case Description. An 87 year old woman was admitted to the Hospital of Traumatology and Orthopaedics on November 30th, 2021 due to a fall (domestic trauma). The patient was diagnosed with a periprosthetic fracture of the left femur distal metaphysis. Anamnesis revealed left femur osteosynthesis with intramedullary nail due to a pertrochanteric fracture in 2018 and left knee total arthroplasty in 2007. A high risk surgical therapy was planned due to the patient's comorbidities – osteoporosis, aterosklerosis, coronary artery disease, arterial hypertension, congestive heart failure, chronic renal disease. On December 2nd during surgical therapy previous cephalomedullary nail was removed and replaced with a retrograde femoral nail through the femoral component of the knee prosthesis. Due to the poor bone quality the fracture was additionally fixated with a distal 5.0 mm locking plate. Physiotherapy was initiated already on the second post-operative day, the patient was ambulating with a walking frame.

Summary. Treatment with internal fixation using intramedullary nail and plating was required to gain more stability due to diminished *bone* density and compromised biomechanical integrity.

Conclusions. In cases when patients are uncooperative and early weight bearing on the operated leg is expected, one of the most important factors in periprosthetic fracture surgical treatment is to achieve a good stability.

ILIOPSOAS MUSCLE ABSCESS AND PROTEUS MIRABILIS CAUSED SEPSIS: A CASE REPORT

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Keywords. Musculus Iliopsoas abscess; Sepsis; Proteus mirabilis

Introduction. Iliopsoas muscle abscess (IPA) is a relatively uncommon and potentially life-threatening infection. Diagnostics of IPA are challenging due to nonspecific clinical presentation and insidious onset.

Case Description. An 85-year-old woman was admitted to the Hospital of Traumatology and Orthopaedics in Riga with pain in the right hip and a two days lasting fever. Within the last two weeks the patient became fatigued and less communicative and experiencing anorexia. Palpatory pain, petechiae and decreased range of motion were found locally during physical examination. A computed tomography (CT) scan revealed a 10–12 cm abscess in right psoas communicating with the wing of the ilium and continuing further into the epigastrium. The patient underwent emergency surgery – inspection and drainage of the iliopsoas abscess. The content of the abscess was around 500–700 mL and had been taken to culture isolation. Proteus Mirabilis was isolated in blood and purulent discharges and the patient received IV antibiotic therapy. The patient was hemodynamically unstable the previous week and died a week later. A conducted autopsy showed pus in the pancreas, abdominal cavity, and right pelvis around the prosthetic; the cause of death – was sepsis caused by Proteus Mirabilis.

Summary. This case demonstrates iliopsoas abscess and sepsis caused by Proteus Mirabilis. Patient's symptoms two weeks before hospitalization were not common for sepsis or abscess. The patient was treated and an emergency surgical treatment was performed. Due to an uncharacteristic course of the disease the patient died.

Conclusions. The vague symptoms presented in this patient caused misdiagnosing and delay in the treatment. The probability of IPA should be considered in patients with back or abdominal pain, hip hyperextension or flexion pain, and fever.

PROPHYLACTIC SOFT TISSUE RECONSTRUCTION OF THE KNEE REGION WITH A FREE ALT FLAP PRIOR TO TOTAL KNEE ARTHROPLASTY

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Keywords. Free ALT flap; Massive soft tissue defect; Reconstruction; Gunshot wound; Gonarthrosis

Introduction. Good quality soft tissue envelope over total knee arthroplasty (TKA) is mandatory for successful post-operative outcomes in knee arthroplasty surgery. Major injuries affecting peri-genicular soft tissue and knee joint might lead to excess scarring and post-traumatic knee joint arthrosis. In this case scenario, complex knee joint reconstruction might be indicated.

Case Description. 51-year-old male patient has referred to Plastic and Reconstructive Surgery Department with a massive scar on the left knee region and post-traumatic end-stage gonarthrosis as a result of a gunshot injury 15 years ago. The patient was consulted by orthopedic surgeon who has recommended a total knee replacement. Due to the massive scar and lack of soft tissue envelope the patient was referred to our department for “prophylactic” soft tissue reconstruction before knee joint replacement. Roughly 12×7 cm post-traumatic scar was observed on the anteromedial aspect of the left knee. The skin was fixed to the tibia and femur with a lack of subcutaneous tissue. Scar and the affected area were excised and that resulted in 15×10 cm soft tissue defect that was reconstructed with a single perforator free ALT flap. The flap was anastomosed to superior medial genicular vessels in end-to-end fashion. Post-operative period was uneventful, and the patient underwent successful TKA 6 months later.

Summary. This clinical case presents successful functional and surgical outcome in complex knee joint reconstruction that required prophylactic soft tissue free flap reconstruction and total knee joint replacement due to gunshot injury to the knee area.

Conclusions. Collaborative approach between reconstructive plastic surgeons and orthopedic surgeons is mandatory in the decision-making process and surgical execution in complex knee joint reconstructions to ensure successful surgical outcomes.

CASE REPORT: ABDOMINAL SPLENOSIS

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Keywords. Splenosis; Splenectomy; Abdominal tumor differential diagnosis

Introduction. Splenosis is a benign condition that can manifest after trauma or surgery involving the spleen. It is an auto- transplantation of splenic tissue and has been observed in the abdominal, thoracic cavities and subcutaneously. Splenosis is usually found on radiological examination, during surgery and in most cases is asymptomatic. Treatment is only required if a patient complains of abdominal pain, obstruction or bleeding. On radiological examination splenosis can be similar to a metastatic malignant disease, endometriosis and other tumors depending on its location and distribution.

Case Description. A 34 year old female patient complained of dull, intermittent pain in the lower right quadrant of the stomach. The intensity of the pain was 2–3 on the scale from 1 to 10, over the course of the previous month the pain had intensified. The patient reported to have had a splenectomy in 1991. During an ultrasound a solid mass (47×42 mm) was observed posteriorly to the right of the uterus. The structure had medium vascular density and was reminiscent of the endometrium. A similar mass was observed during an examination 1 year prior. During an MRI a pathological tumor of the uterus-cervix junction was suspected. A laparoscopy to extirpate the tumor was performed. The histological results showed splenic tissue.

Summary. We report a case of a female patient, who complained about abdominal pain. Patient reported to have had a splenectomy in 1991. On radiological examination a solid mass was observed by the uterus. The histological results showed splenic tissue.

Conclusions. It is important to know the patient's medical history concerning splenic trauma or splenectomy. In all patients with such history, splenosis should be on the differential diagnosis if tumors are present in the abdominal, pelvic or thoracic cavities, especially when systemic symptoms are absent, in order to avoid unnecessary intervention or medication.

A CLINICAL CASE REPORT OF FETOMATERNAL HEMORRHAGE

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Keywords. Fetomaternal hemorrhage; Neonatal anemia; Fetomaternal transfusion

Introduction. Fetomaternal hemorrhage refers to fetal blood transfer into the maternal circulation. Small fetomaternal bleed is common and clinically insignificant. Massive hemorrhage is generally considered as 30 to 80 mL of fetal blood in maternal circulation. It is a scarce and threatening clinical event resulting in profound neonatal anemia and is associated with high perinatal mortality.

Case Description. 25-year-old patient was admitted to emergency department at 37 weeks of gestation due to diminished fetal movements. Cervix was 3 cm length and closed, no vaginal bleeding, uterine contractions or ruptured membranes was detected. Ultrasound examination showed normal fetal weight, normal amniotic fluid volume and flow in the umbilical artery, no gross fetal body movement, no fetal tone and no fetal breathing movements with biophysical profile test score results 4 points. Cardiotocography (CTG) monitoring showed sinusoidal heart rate, there was lack of accelerations and absence of active fetal movements. The decision for delivery was made due to suspected fetomaternal hemorrhage and fetal anemia. Emergency Caesarean section was performed and an alive female fetus was delivered weighting 3485 g, with APGAR score 2-7-7. There was no evidence of placental abruption, amniotic fluid was clear. Kleihauer–Betke test showed that there were 266 mL of fetal blood in maternal circulation. The newborn was transferred to the neonatal intensive care unit, had blood transfusion. The newborn was transferred to the neonatal intensive care unit, had blood transfusion. After intensive care there was no neurological damage during first 7 days.

Summary. This clinical case demonstrates massive fetomaternal hemorrhage resulting in life-threatening severe fetal anemia requiring extensive resuscitation and neonatal blood transfusion.

Conclusions. Hence, massive fetomaternal hemorrhage is rare yet immensely dangerous perinatal pathology. It is crucial to identify this condition early and to intervene immediately as delay increase the risk of fetal demise.

FLUORESCENCE IMAGE-GUIDED CHOLANGIOGRAPHY IN A PATIENT WITH ACUTE CHOLECYSTITIS AND ATYPICAL BILE DUCT ANATOMY. A CASE REPORT

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Keywords. Surgery; Gallbladder; Fluorescence imaging guided; Laparoscopic

Introduction. Laparoscopic cholecystectomy (LC) is one of the most commonly performed surgery worldwide. In the US approximately 750 000 cholecystectomies are performed, a vast majority being laparoscopic (Merry, 2018). Norway performed approximately 6300 LC in 2021 (Helsedirektoratet, 2022). It has become the gold standard of treatment for acute cholecystitis, as well as for symptomatic gallstone disease. It has been linked with lower complication rates and shorter postoperative stay, compared to open cholecystectomy. (Terho, 2016). With the advances in modern medicine several techniques have been developed to make this procedure even safer. One of the newest of such tools is fluorescence imaging guided surgery, which is the modality used in this case report.

Case Description. A 60-year-old woman was admitted to the emergency department with acute cholecystitis, acute cholangitis and suspected choledocholithiasis according to *the Tokyo guidelines 2018*. The patient presented with a 4-day history of upper abdominal pain, jaundice, fever and chills. Laboratory test showed; leukocytes $15.26 \times 10^9/L$, CRP 12.7 mg/L, ALAT 187 U/L, ASAT 243 U/L, total bilirubin 64.9 $\mu\text{mol/L}$. Ultrasound revealed thickened gallbladder wall 5 mm and lumen filled with multiple small stones, and common bile duct size 5 mm. The patient was admitted to the surgery department and further MRCP was performed and confirmed the diagnosis of acute calculous cholecystitis, without stones in EXBD. As a final treatment modality, the patient was scheduled for LC with FC. During the LC fluorescence cholangiography showed a rare EXBD anatomical anomaly; the cystic duct emerged from the left hepatic duct.

Conclusions. FC is easy applicable, effective and a safe method for real time visualisation of the EXBD. Furthermore it improves the surgeon's ability to perform a safer laparoscopic cholecystectomy.

REVISION TOTAL KNEE ARTHROPLASTY: MANAGEMENT OF IRREDUCIBLE PATELLAR FRACTURE

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Keywords. Revision total knee arthroplasty; Irreducible patellar fracture

Introduction. The prevalence of patellar fracture after revision total knee arthroplasty (rTKA) varies from 0.5 to 3.8%. Following femoral fractures it is second most common periprosthetic fracture after TKA. Patellar fractures with intact extensor mechanism usually are treated nonoperatively with good or excellent results. However, failure of extensor mechanism and displacement of fracture requires surgical treatment and is often related to high complication rate.

Case Description. A 64-year-old male, who underwent multiple knee arthroplasty procedures in the past, was admitted to the hospital due to severe left leg pain and lack of its mobility. X-rays revealed patellar fragmentation with wide displacement, femoral and tibial component was stable. During the surgery multifragmentary patellar fracture, retraction of patellar ligament and soft tissue defects were seen. Since patellar fracture was irreducible, a new patella from trabecular metal augment and patellar implant was formed, using bone cement to connect two parts. Additionally MUTARS attachment tube was utilized to form lodge for new patella. It was attached to the tibia using two 4.5 mm cannulated screws. Also tube was attached to patellar ligament and quadriceps muscle using nonabsorbable sutures. No postoperative complications were observed.

Summary. This study represents an irreparable patellar fracture that appeared after multiple total knee arthroplasty procedures in the past. Trabecular metal augment, patellar implant and MUTARS attachment tube was utilized to form new patella and restore knee joint function.

Conclusions. Although, patellar fracture is infrequent complication after revision total knee arthroplasty, it sometimes requires complex solutions in order to manage it. When reduction of fracture fragments is non-viable, novel solutions can be adjusted to restore knee extensor mechanism.

GIANT ECTOPIC PARATHYROID ADENOMA. CASE REPORT

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Keywords. Giant parathyroid adenoma; Primary hyperparathyroidism

Introduction. In about 80% of cases of primary hyperparathyroidism, the cause of the disease is a single adenoma. However, only 1.4% of parathyroid adenomas in the group of patients who are diagnosed for primary hyperparathyroidism, can be found in ectopic location. Furthermore, giant parathyroid adenoma, measuring above 2 cm shall be assimilated to be very rare. On the basis of previous research it is assumed that correlation between parathyroid gland size and calcium as well as parathyroid hormone (PTH) levels may occur.

Case Description. A male suffering from chronic kidney disease was admitted to the Endocrinology Department due to significantly increased PTH level: above 3000 pg/mL and hypercalcemia: 3.59 mmol/L. The patient's past medical history included arthralgia lasting for a year, several bilateral percutaneous nephrolithotomies and cholecystectomy. The ultrasound of a neck did not identify enlarged parathyroid glands. Imaging studies, including chest X-ray, SPECT and PET- MR, revealed presence of the tumor mass in the upper mediastinum. Due to its location, conducting a biopsy was not possible. Additionally, densitometry showed osteopenia and PET-MR indicated the inherence of brown tumors in bones. After a thorough assessment, the mass was resected from the upper mediastinum through the parasternal approach. Operation was performed effectively by the team of general and thoracic surgeons. Postoperative course was uneventful. Pathomorphological evaluation of excised material confirmed a giant parathyroid adenoma measuring 3.5×2.5×2.2 cm.

Summary. We report a case of patient with symptoms of hyperparathyroidism in whose a rarely occurring giant parathyroid adenoma was discovered in ectopic location. Successful treatment have been achieved through a multidisciplinary approach.

Conclusions. Significant diagnostic difficulties and technical challenges during the course of treatment of patients with giant parathyroid adenomas may occur. Although, it is possible to perform an effective and safe surgical therapy, if well-established team in multimodal hospital undertakes to do it.

PATHOLOGICAL BLEEDING FROM LAPAROSCOPIC INCISION WOUND AFTER OVARIAN CYST RUPTURE

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Keywords. Factor IX deficiency; Perioperative bleeding; Hemophilia carrier; Ovarian cyst

Introduction. Haemophilia B, also called Christmas disease, is an X-linked recessive rare genetic disorder characterized by deficient clotting factor IX. X linked recessive congenital disorders occur in males, but females are considered as carriers. Most of the carriers are asymptomatic and expected mean factor IX levels is 50% of the levels found in healthy population. Rarely carriers could have factor levels in Haemophilia range and manifest with bleeding, particularly because of trauma or surgery.

Case Description. A 27 year old Caucasian female was admitted to the emergency department due to the severe pain in hypogastrium after *coitus*. Pain was intensified by any movement and position change. Pelvic ultrasonography was done and described right ovarian cyst rupture with internal bleeding. After patient and data evaluation, surgical treatment was done. In early perioperative period, patient presented with severe bleeding from the incision site. Laboratory tests showed moderate stage anaemia with haemoglobin levels of 9.6 g/dL (N = 12.0–14.0 g/dL) and prolonged activated partial thromboplastin time – 46.2 sec. (N = 20–40 sec.). The wound was revised and redressed. Severe bleeding has not repeated. Patient was discharged on the 3rd postoperative day, with no complaints. As outpatient, patient received haematologist consultation. There were no complaints at appointment, there was negative bleeding anamnesis and no family history of any bleeding disorders. Coagulation testing was performed. Laboratory tests showed factor IX deficiency. Factor IX level of 20% was detected. There were no inhibitory antibodies to factor IX. Patient was referred for further genetic investigations.

Summary. Adult female patient who presents with unusual bleeding from surgical incision wound, prolonged activated thromboplastin time without any pathological bleeding in history can have a rare case of symptomatic coagulation factor IX deficiency.

Conclusions. A multidisciplinary team approach and laboratory support are important for safe patient management and diagnosis establishment in any unusual bleeding case.

AGGRESSIVE CERVICAL CANCER IN A YOUNG PATIENT

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Keywords. Cervical cancer; HPV; Arterial embolization

Introduction. Cervical cancer is a preventable malignant disease if women regularly participate in organized screening and have vaccinations against human papillomavirus (HPV). In the group from 25 to 29 years of age, cervical cancer occurs in 2% of cases every year.

Case Description. A 28 years old woman is admitted to the Emergency clinic of Riga East University hospital with complaints of severe vaginal bleeding for 4 days, weakness, and exhaustion. She considers them to be related to her menstrual cycle. Findings: exophytic tumor of the cervix about 10 cm in diameter and active bleeding from it. Differential diagnosis: submucosal nodule of uterine fibroid, large endometrial polyp, cancer. The Hb level is 4.4 g/dL. A blood transfusion is performed, a biopsy is taken and a radiological examination is performed and the patient is discharged to await the results. The results of the biopsy are not informative. A repeat biopsy is indicated. It is performed 5 days later. Malignancy was not confirmed and additional biopsy is required. After 7 days, the patient is hospitalized with complaints of pain in the lower abdomen region and difficulty urinating. Bladder catheterization was performed due to mechanical compression of the tumor. A third biopsy was taken. Cystoscopy was performed, but tumor ingrowth was not ascertained. Despite the therapy, the bleeding recurs. Permanent uterine artery embolization is performed. Bleeding significantly decreased. In the repeated histological report- adenosquamous carcinoma cannot be excluded. At the multidisciplinary meeting with oncogynaecologists, it was decided to undergo a palliative hysterectomy. Operation: Total hysterectomy with bilateral salpingectomy, and ovarian transposition. Diagnosis: cervical cancer IIB (pT2bN0M0G3L+V-R0). Subsequent radiation chemotherapy is indicated.

Summary. Cervical cancer diagnosis and treatment can be challenging and requires a multidisciplinary approach.

Conclusions. It is important to vaccinate all adolescence against HPV and to participate in the organized screening program.

VESICourethRAL REFLUX: A CASE REPORT ON REPEATED RENAL TRANSPLANTS FOR PATIENT WITH INHERITED THROMBOPHILIA

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Keywords. Vesicoureteral reflux; Nephropathy; Thrombophilia; Renal allograft

Introduction. Vesicoureteral reflux is the retrograde passage of urine from the bladder to the upper urinary tract. It is the most common hereditary urological abnormality and a crucial risk factor for chronic renal failure and nephropathy, which may result in damage of kidney allograft due to autoimmune reactions, and infections. Patients with thrombophilia are at higher risk of early kidney transplant dysfunction due to allograft renal vein thrombosis. The current study presents a case of a patient with inherited thrombophilia and repeated renal allograft surgeries.

Case Description. We present a 38-year-old female patient with a history of end-stage renal disease due to vesicourethral reflux, diagnosed by the age of 20, and inherited thrombophilia caused by mutations in F5 and MTHFR genes. The patient had a background of recurrent urinary tract infections, pulmonary embolism, multiple failed attempts of native arteriovenous fistula formation, and arteriovenous prosthesis thrombosis following reconstruction. The patient underwent hemodialysis procedures. Low molecular heparin was induced perioperatively. Double nephrectomy, a total of three renal allograft transplantations with previous transplantectomies were performed. Transplants were implemented due to stage 4 chronic allograft renal disease. Folic acid therapy was prescribed due to F5 gene mutation, and high homocysteine levels. Antithymocyte globulin immunosuppressive therapy was administered as a result of high sensibilization risk. No complications have been reported after the third renal transplantation until today.

Summary. This report demonstrates a case of surgical allograft transplant treatment in a patient with vesicourethral reflux and inherited thrombophilia with combination of hemodialysis procedures, and anticoagulant therapy, followed by immunosuppression with anti-thymocyte globulin.

Conclusions. Patients with inherited thrombophilia may benefit from arteriovenous prosthesis choice over fistula for hemodialysis administration. Perioperative anticoagulation in patients with thrombophilia may lower the thrombosis risk development. Inherited thrombophilia genetic testing is recommended for lowering the risk of renal graft failure among patients with vesicourethral reflux and detected coagulation dysfunction.

SQUAMOUS CELL CARCINOMA OF THE EXTERNAL AUDITORY CANAL: CASE REPORT

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Keywords. Squamous Cell Carcinoma (SCC); External Auditory Canal (EAC); Neoplasm of the EAC

Introduction. Squamous cell carcinoma of the EAC is a malignant tumor of external ear and is able to penetrate the surrounding tissues. The approximate annual incidence is 1–6 cases per million population. This tumor constitutes for less than 0.2% of all head and neck cancers, and only 4% of external ear cancer cases are localized in the EAC. The first symptoms of carcinoma of the EAC are discomfort and pain in the ear, discharge. Because of the non-specific symptoms the diagnosis is often delayed, resulting in a negative prognosis.

Case Description. A 61-year-old woman was admitted to the PSCUH complaining of left ear discomfort lasting about 1.5 months, discharge, pain, and minor bleeding from the EAC. Abnormal tissue in the EAC was observed, the tympanic membrane was not visible, and granulation is evident. The CT scan of pyramids demonstrated an aberrant mass of soft tissue that completely fills the EAC. This pathological tissue clings closely to the walls of the EAC and the tympanic membrane. The pathohistological examination has shown moderately differentiated (Grade 2) infiltrative SCC. Radical resection of the left ear, tumor excision, ear obliteration with abdominal fat tissue were indicated.

Summary. The author provides a case report of a 61-year-old woman with a primary malignant formation in the left ear aisle diagnosed with SCC and was given radical surgery. According to TNM classification, the tumor corresponds to T1N0M0G2L+V-R0.

Conclusions. SCC of the external auditory canal is a rare pathology. Initial non-specific symptoms make prompt diagnosis challenging. Otoscopy is essential for identifying the tumor and establishing a prompt diagnosis. To make the diagnosis clear and to decide the next course of treatment, histological and radiological methods must be employed. Radical surgical procedures constitute the foundation of treatment, along with adjuvant radiotherapy.

MULTIPLE COMPLICATIONS AFTER REVISION KNEE REPLACEMENT SURGERY: A CASE REPORT

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Keywords. Orthopaedics; Surgery; TKA; Revision; Dislocation; Infection; Arthroplasty

Introduction. Revision total knee arthroplasty (TKA) is a technically challenging surgical procedure with poorer results than primary TKA. The most common causes requiring a revision TKA are infection, implant loosening, or breakage. Predominant factors of implant loosening or breakage are high-impact activities, obesity, and prosthesis wearing out.

Case Description. A 61-year-old patient presented with intense pain and limited joint mobility of the left knee. Physical and radiological findings revealed a dislocation after primary TKA, which was performed 5 years ago. Constrained revision TKA was the first choice of treatment due to various complications after multiple TKA revision surgeries of the right knee joint. Medical history revealed that 2 years ago revision TKA of the right knee joint was performed with a hinge-type knee revision prosthesis due to the instability of the components and ligament rupture. 2 months after the surgery, the patient experienced another injury, which also required revision surgery. 5 months after the second revision surgery an infection of the right knee joint occurred and it was treated with antibiotic therapy, which was followed by two-stage revision surgery. During the following year, the patient experienced two more dislocations of the right knee due to injuries, subsequently semi-constrained and constrained revision TKA surgeries were performed.

Summary. This case report presents a patient with multiple complications such as infection, implant loosening, and prosthesis dislocation after revision total knee arthroplasty. With these kinds of complications in such a short time, orthopedic surgeons were exposed to different technical difficulties such as bone loss management and prosthesis selection.

Conclusions. Revision TKA is a longer and more complex procedure compared to primary total knee replacement surgery, and has a greater risk of potential complications. Several revision TKA surgeries of a single joint are exceptionally demanding procedures and require a well-planned operative approach.

MULTIPLE COMPLICATIONS AFTER REVISION KNEE REPLACEMENT SURGERY: A CASE REPORT

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Keywords. Retrocecal appendicitis; Pylephlebitis; Thrombosis

Introduction. The retrocaecal position of the appendix varies significantly between studies from 14 to 36%. Due to its various and non-specific clinical presentations, the diagnosis often is delayed. Appendicitis accounts for about 10% of all cases presenting with pylephlebitis. It is a rare complication with an incidence of 0.05% for acute appendicitis. The diagnosis is usually complex and delayed. The mortality rate remains high– 11%–32%.

Case Description. In November 2021, 49 years old male was admitted to the emergency department with prolonged vomiting (4 weeks), reduced appetite, fatigue, episodes of febrile temperature, and weight loss (10 kg during the first month). USG and CT showed partial v.portae thrombosis, full v. mesenterica superior thrombosis, aneurysm, and suspected periappendicular abscess. The patient received i/v heparin, antibiotics and had peripheral vein thrombolysis. The patient's general condition was unchanged – weakness, fatigue remained. Diagnostic laparoscopy was indicated. Intraoperatively retrocecal, retroperitoneal destructive, gangrenous appendicitis with abscesses and perforation was found. Due to the appendix location laparoscopic operation was switched to McBurney laparotomy to perform an appendectomy. The postoperative period went without complications. The patient's general condition improved and the patient was discharged.

Summary. The patient's retrocecal appendicitis diagnosis was delayed due to the unspecific symptoms, which lead to perforation and abscess formation. As a complication developed pylephlebitis with v. porta partial thrombosis and v. mesenterica superior total thrombosis.

Conclusions. Pylephlebitis results from an uncontrolled abdominal infection in regions adjacent to or draining into the portal system. This condition is associated with a high mortality and morbidity rate mainly due to its nonspecific presentation leading to a delayed or even missed diagnosis. Immediate treatment, a broad spectrum antibiotic therapy combined with effective anticoagulant therapy and treating the source of infection reduces the mortality rate from 7–20%.

GIRDLESTONE PROCEDURE AFTER LEFT HIP ARTHROPLASTY

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Keywords. Acetabulum fracture; Arthroplasty; Girdlestone procedure

Introduction. Girdlestone procedure is a salvage procedure, it is a type of surgery performed on individuals experiencing severe painful hip conditions, and is generally only used in circumstances where no other options are viable. It is effective in addressing joint pain, but the most prominent downside is that it leaves the affected limb shorter than the other.

Case Description. The patient is a 65 year old woman, she is a chronic smoker, with a BMI = 38.5, she has depression, chronic heart failure, pulmonary hypertension, arrhythmias, spondylosis of cervical and lumbar spine with radiculopathy. In 2018 the patient was diagnosed with osteoarthritis in both knees. In the same year she underwent left knee arthroplasty. In the postoperative period, an acute infection of the knee arthroplasty developed. Revision surgery was performed. In 2020 a left hip arthroplasty surgery after fracture of the neck of the femur. In 2021 the patient fell and fractured her acetabulum. The patient presents with complaints of left hip pain on exertion for 6 months, night pain, morning stiffness. The patient also mentions how the pain has recently worsened. In 2022 the clinical diagnosis is a dislocation of the left hip arthroplasty after transacetabular fracture with posterior margin fracture, marked bony defects. A revision operation and a removal of the endoprosthesis was performed. The patient has undergone a Girdlestone procedure.

Summary. The Girdlestone procedure was performed on the patient to improve the quality of life – reduce pain and mobility.

Conclusions. The patient's left leg is two cm shorter than the right leg. The patient spends every day walking with crutches and placing the toes of her left foot on the ground.

RECONSTRUCTION OF MULTIPLE LOCATION BEDSORES

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Keywords. Spinal trauma; Bedsores; Reconstructive surgery; Autograft

Introduction. The Regress of a patient's functional integrity due to spinal trauma is often complicated by the development of multiple bedsores. Reconstructive autograft surgery is used to maximize physiological and functional well-being.

Case Description. A patient has a history of spinal trauma suffered in 2018 with a lower paresis, leading to the development of bedsores – in the sacrum area, the greater trochanter area, and the ischial tuberosity area. The patient was initially subjected to debridement and subsequently, the formation of a lower extremity flap of the right leg was carried out. On 11.02.2021 a flap was prepared to the plantar surface of the right foot to the hip joint for a wide soft tissue flap on the front surface. The soft tissue was separated from the bone architecture, as well as the patella resection and tibia exarticulation in the knee, hip joint arthrotomy and femur exarticulation from acetabulum were carried out. After repeated debridement of ulcers, the flap is folded from the front surface of the right side across the right trochanter area, the sacrum area towards the left pelvis. The shape of the flap is created by adjusting it to the bedsores areas. At the end, flap fixing, drain insertion, and application of an aseptic bandage were carried out. Due to the dehiscence of perianal wounds caused by faecal contamination, a sigmoidostoma was formed on 04.03.2021.

Summary. An autograft creation with the right leg exarticulation was a reconstructive manipulation to improve the quality of life and health of the patient.

Conclusions. Late results reveal a successful scarring process. The patient is able to perform a lot of daily routines.

CHALLENGES IN TREATING LOWER EXTREMITY ULCER WITH POST-TRAUMATIC HEMATOMA

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Keywords. Post-traumatic; Chronic ulcer; Treatment; Lower extremity

Introduction. Lower extremity ulcerations are a significant problem, causing morbidity and economic burden worldwide, with increasing prevalence due to an aging population and rising obesity and diabetes cases. These non-healing wounds can lead to severe complications like infection, amputation, and malignant transformation.

Case Description. We present a case of 63 years old women with chronic ulcer in the lower extremity with post-traumatic hematoma. The patient suffered an injury to her left calf in April. After the injury, there was a large hematoma, which was opened under the supervision of a surgeon. The calf remained swollen, red, painful, exhibited increased levels of D-dimers. Erysipelas was suspected and the wound was treated accordingly. Subsequently, the patient was referred to a vascular surgeon for further management. The wound dimensions were measured as 1.5 cm in depth, 0.7 cm in width, and 1.0 cm in length. Excision of the edge of the wound was performed and was prescribed treatment with Aquacel Ag plus Extra bandage, but allergy was observed. After the wound culture confirmed the absence of infection, Granugel gel and a secondary dressing of Granuflex were applied. The exudation was observed, the bandage was changed every other day, and the vascular surgeon was visited every 2 weeks, and debridement was applied if necessary. Until complete healing – applied only Granugel and Granuflex. Fully healed after 2 months.

Summary. It's crucial to be vigilant and keep a close eye on any changes in symptoms, regardless of the origin of the wound. In this particular case, constant monitoring not only allowed for early detection of any issues but also ensured that the course of the disease is managed effectively.

Conclusions. Adequate understanding of the underlying pathophysiology, appropriate diagnostic approaches, and effective management strategies are essential in addressing this prevalent and debilitating condition.

THE IMPORTANCE OF REDUCTION IN THE OSTEOSYNTHESIS OF A SEGMENTAL FEMORAL FRACTURE

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Keywords. Segmental femoral fracture; Open fracture reduction; Osteosynthesis

Introduction. Segmental fracture consists of two or more fracture lines that isolate a segment of bone. These fractures usually occur after high-energy trauma. Annually, femoral fractures occur 37.1 per 100000 people and only a few of them are segmental. Typically, delayed consolidation occurs after these injuries. It is necessary to position and fix the bone fragments as physiologically correctly as possible.

Case Description. A 32-year-old male patient complained about right thigh pain and dysfunction. The patient injured in a car accident in 2019. The right femur segmental and ipsilateral acetabulum fractures were diagnosed. Open reduction and internal fixation (ORIF) performed. Closed reduction and internal fixation (CRIF) with intramedullary nail (IMN) performed for right femur fracture management. Due to pain and non-healing femur fracture, revision surgery and bone grafting was performed. During the examination, the right thigh deformity and limitation of movement occurred, proximal to middle third of right thigh was painful when palpated and weight bearing. X-ray and CT scan confirmed non-union and malposition of the femur fragments (segment). On CT examination partial consolidation of bone fragments of the femur was found. Reduction of the fracture was not appropriate and only partially fixed with a intramedullary nail (IMN) and loose 8 cm bone segment of middle third of the femur left unnailed. A year later, the patient was hospitalised and revision femur osteosynthesis was performed. Open fracture reduction under C-arm control was done, IMN was passed through free segment of the femur. The postoperative period was without complications. Full right femur healing confirmed 3 months postoperatively.

Summary. This case report demonstrates the patient after femur revision osteosynthesis with an intramedullary nail and the importance of fracture reduction.

Conclusions. Segmental fractures remain rare. Their management, after the elimination of a vital emergency, remains a challenge for the orthopaedic surgeon.

NOCTURNAL ENURESIS DURING PREGNANCY: A CASE REPORT

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Keywords. Pregnancy; Nocturnal enuresis

Introduction. Nocturnal enuresis is a significant problem among children: 25% of 5-year-olds have nocturnal enuresis episodes, but only 2% carry the symptoms into adulthood. Among women who experienced nocturnal enuresis in childhood, the pathology reoccurs during pregnancy in over 64% of the cases. The aim of this case report is to present the recurrence of nocturnal enuresis during pregnancy.

Case Description. A 20 years old primiparous woman presented at 20 weeks of gestation complaining of involuntary nocturnal urination episodes. The complaints started at the 8th week of gestation. The patient's urinary incontinence episodes were occurring only once during the night. Episodes of enuresis repeated from several times per week to every night. Occurrence of enuresis episodes had no correlation with specific food and fluid consumption, lifestyle or stress level. The patient experienced similar symptoms in childhood. No thorough neurological or urological examination was performed at that time and the patient was only treated for suspected urinary tract infections with no relief of symptoms. At the age of 16 spontaneous remission was achieved and enuresis did not reoccur until the first trimester of this pregnancy. Pelvic floor muscle training and relaxation exercises before sleep were recommended during the pregnancy to avoid nocturnal enuresis, however no substantial effect was observed. The patient reported slight improvements of the symptoms during the second trimester, but the problem persisted and even worsened during the third trimester of pregnancy.

Summary. A female patient experienced childhood nocturnal enuresis up until 16 years old. After spontaneous remission symptoms reoccurred during the first trimester of pregnancy and continued during the pregnancy. Conservative treatment showed no effect.

Conclusions. The cause of nocturnal enuresis is known to be multifactorial. Here we report a clinical case of nocturnal enuresis during adulthood and pregnancy as a possible risk factor for recurrence.

KNOWLEDGE AND RESPONSIVENESS OF MEN REGARDING EARLY PROSTATE CANCER SCREENING IN THE PRACTICE OF FAMILY PHYSICIANS

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Keywords. State-funded screening; Prostate cancer; Knowledge of prostate cancer screening

Objectives. Latvia had the highest prostate cancer death rate in the EU in 2017. From 2021 state-funded screening is available for men 50–75, earlier screening for those with family history. Study aims to examine men's knowledge and factors influencing their response.

Materials and Methods. A cross-sectional study on men aged 45–75 was conducted from May to November 2022. Participants completed an anonymous questionnaire. Data was analyzed using IBM SPSS.

Results. The study analyzed 143 men in Latvia, with a mean age of 60.4 (± 9.4) years. Most men (61.5%) knew about the prostate cancer screening program at their Family Doctor's practice, but education level significantly affected knowledge of availability ($p = 0.009$). Only 19.6% of respondents knew at what age men could participate in the program if there was no positive family history, and only 16.8% knew up to what age the screening is carried out. Most (55.2%) respondents had not previously participated in the program, with higher education levels participating more often than those with basic education ($p = 0.004$). Among those who had not participated in the program, most (56.9%) were not informed about it by their doctor, but 64.4% would not participate even if informed, citing lack of trust in the results, lack of concern about prostate cancer, and concern about the procedure. However, 90% of men without a positive family history and under 50 years old would like to participate in the screening. Among those who had undergone the screening, 71.9% would repeat it, while 28.1% would not, citing minor concern about prostate cancer and lack of trust in the results as the main reasons.

Conclusions. Study shows low prostate cancer screening knowledge and link to education level. Many respondents not informed by doctors and wouldn't participate even if informed. Reasons included lack of trust in results and concerns about procedure.

FACTORS ASSOCIATED WITH LATVIAN GENERAL PRACTITIONERS' DECISION TO ADOPT PREVIOUSLY UNKNOWN DRUGS IN THEIR PRACTICE

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Keywords. Drugs; General practitioner (GP); Drug adopting

Objectives. General practitioners' drug list tends to vary from one GP to another. It is up to GP to determine which medications are in the list. The focus of this study is to uncover either criteria for new drug inclusion into a GP's personal drug list are evidence-based or not.

Materials and Methods. This was a descriptive cross-sectional study carried out among Latvian GPs for the period from June to October 2022. Each participant was asked to evaluate the provided factors by importance: were evaluated 8 factors for drug including and 7 for rejecting. The data were analyzed using Microsoft Excel and IBM SPSS 25.0. The descriptive statistics and Chi-square test were used to describe results and determine statistically significant differences ($p < 0.05$).

Results. A total number of 98 GPs anonymously participated in the study. Three most frequently chosen factors by GPs considering a new drug adoption are: (1) the fact that a new drug is inserted into national guidelines or professional association recommendations, (2) the fact that a drug was researched in highly recognized studies and (3) the fact that information from the seminars positively describes new drugs – 55.1%, 22.4% and 10.2% correspondingly. Three most frequently chosen factors by GPs considering a new drug rejection are: (1) the fact that a drug was not researched in highly recognized studies, (2) the fact that a new drug is not inserted into national guidelines or professional association recommendations, (3) the fact that information from the seminars negatively describes new drugs – 35.7%, 31.6% and 12.2% correspondingly.

Conclusions. Based on the study results for new drug adoption and rejection, the most significant factors for GPs are the drug insertion into nation guidelines and drug research in highly recognized studies. The results show that a majority of Latvian GPs rely on evidence-based resources.

AWARENESS OF THE COVID-19 VACCINE INDUCED THROMBOSIS WITH THROMBOCYTOPENIA SYNDROME AMONG THE HEALTHCARE PROFESSIONALS

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Keywords. COVID-19; Vaccination; Healthcare professionals (HCPs); Thrombosis with thrombocytopenia syndrome (TTS)

Objectives. COVID-19 is a pandemic caused by the SARS-CoV-2 virus. Vaccination against COVID-19 is the primary way to prevent the spread of the disease. But there have been reports of TTS after vaccination with viral vector vaccines. It is considered to be a rare but dangerous side effect. The aim was to assess HCPs attitudes towards COVID-19 vaccination, knowledge and awareness of the TTS.

Materials and Methods. This cross-sectional study includes an anonymous questionnaire that was shared with HCPs involved in COVID-19 vaccination in Latvia. The questionnaire was sent through e-mail, answers were collected in August – October 2022. Data were analyzed using MS Excel.

Results. Out of 103 respondents, 91.3% were female, 60.2% had a work experience of 21 years or more. The majority (87.4%) are aware of TTS. Information about TTS was obtained through state institutions (Ministry of Health, Center for Disease Prevention and Control, etc.)(73%), from the State Agency of Medicines (48.4%) and a professional association (47.3%). 77.7% can name at least one symptom of TTS. 50% know that the probability of getting TTS is very rare ($< 1/10\,000$). Only 53% are aware of any guidelines on how to treat TTS, but 66.7% believe that they know what to do when TTS is suspected. 13 of the respondents suspected or witnessed TTS, 69% ($n = 9$) of them referred the patient to a specialist physician.

Conclusions. Most HCPs involved in COVID-19 vaccination are aware of the existence of TTS and know its symptoms. Not everyone is aware of the treatment guidelines, but most respondents know what to do if there is a suspected TTS.

SEXUAL HEALTH IN FAMILY MEDICINE – SCOPE, POTENTIAL AND BARRIERS

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Keywords. Sexual health; Family doctors

Objectives. Sexual health is a critical component of overall wellness. Although family doctors (FDs) are often the first contact for patients' health issues, sexual problems are rarely brought up in appointments with family doctors (FDs). This study aimed to assess the scope of sexual health, existing barriers, and the need for additional training for FDs in Latvia.

Materials and Methods. A cross-sectional study of FDs in Latvia was conducted in March – June 2022. The pre-piloted questionnaire consisted of five fields: a) socio-demographics, b) workload related to sexual health, c) self-reported competence,

d) barriers discussing patients' sexual health and e) education in sexual medicine. Questionnaires were distributed electronically and in-person to FDs, members of one of the two professional associations of FDs in Latvia. Data was analysed using SPSS.

Results. A total of 111 FDs participated in the study. Around half of the FDs reported that they rarely enquire patients about their sexual health (40.5%) and satisfaction with their sexual life (52.3%). Most common sexual health problems discussed with FDs include lack of libido (29.7%) and dyspareunia (23.4%) for women and erectile dysfunction (53.2%) and infertility (25.2%) for men. Shortness of appointment time (78.3%), not prioritizing sexual health (72%), lack of physicians' knowledge (53.1%) and experience (63.9%), as well as effective therapy (60.3%) in the field of sexual medicine were perceived as common barriers in initiating discussion with the patient about sexual health. The majority of FDs expressed that a sexual medicine course in the residency programme (63.1%) and continuum education (57.7%) should be advanced.

Conclusions. Shortness of appointment time and gaps in knowledge in sexual health are among the main obstacles in addressing sexual health problems in GP practice in Latvia. Continuous postgraduate training would assist GPs in maintaining knowledge and consultation skills in sexual health.

RESILIENCE AND ILLNESS DENIAL AS PREDICTING FACTORS OF ADHERENT BEHAVIOR FOR PATIENTS WITH CHRONIC ILLNESSES IN PRIMARY CARE

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Conclusions. Shortness of appointment time and gaps in knowledge in sexual health are among the main obstacles in addressing sexual health problems in GP practice in Latvia. Continuous postgraduate training would assist GPs in maintaining knowledge and consultation skills in sexual health.

IRON DEFICIENCY ANEMIA DURING VEGAN PREGNANCY – HOW BIG OF A PROBLEM?

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Keywords. Veganism; Vegetarianism; Pregnancy; Iron deficiency anemia

Objectives. The popularity of veganism has been steadily increasing in developed countries, including Latvia. However, several sources state that vegans and vegetarians are at higher risk of developing iron deficiency. During pregnancy, iron requirements increase, which often results in iron deficiency. The aim of this study is to investigate and compare the differences in the incidence of iron deficiency and iron deficiency anemia among pregnant vegan, vegetarian and omnivorous women in Latvia.

Materials and Methods. In this cross-sectional study participants were interviewed regarding their dietary habits during pregnancy, and data on hemoglobin and ferritin levels were obtained from medical documentation – the mother's passport. Data were analyzed using IBM SPSS.

Results. 206 women participated in the study (22 vegans; 44 vegetarians and 140 omnivores). During the first antenatal visit, ferritin levels were determined in 59.2% of women. Among them, iron deficiency (ferritin < 15.00 µg/L) was present in 33.3% of vegans, 40.6% of vegetarians, and 26.7% of omnivores. The difference was not found to be significant ($p = 0.354$). Iron deficiency anemia during pregnancy developed in a total of 25.4% of participants. No significant association between the diet group and anemia incidence during pregnancy was found ($p = 0.873$). Veganism and vegetarianism were not associated with higher iron deficiency rates during pregnancy either ($p = 0.375$). During pregnancy, 90.9% vegans; 93% vegetarians, and 84.3% omnivores were taking iron supplements. Vegans tended to use iron supplements for longer than vegetarians and omnivores ($H(2) = 9.18$, $p = 0.01$). Median duration of iron supplement use in weeks was 22.5 (16.25–35) in the vegan group, 15 (10.75–24.25) in the vegetarian group, 15 (11–22) in the omnivorous group.

Conclusions. Vegans and vegetarians are at risk of iron deficiency during pregnancy, as are omnivores. Neither veganism nor vegetarianism was associated with higher incidence of iron deficiency, iron deficiency anemia. Iron deficiency anemia during pregnancy remains a nationwide concern in all pregnancies, regardless of animal product consumption.

FOLIC ACID SUPPLEMENT INTAKE AMONG PREGNANT WOMEN IN LATVIA

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Keywords. Folic acid supplementation; Pregnancy; Latvia

Objectives. Folic acid supplementation (400mcg) daily prior to pregnancy and during the first 4 weeks of pregnancy is recommended for neural tube defect prevention. Daily folic acid supplementation after the first month of pregnancy is still beneficial in preventing risks such as preterm birth and megaloblastic anaemia. The aim of this study is to analyse folic acid supplement intake in pregnant women in Latvia and investigate possible factors affecting it.

Materials and Methods. 137 women post-pregnancy participated in this cross-sectional study. Data on folic acid supplementation during pregnancy and basic characteristics (age, income, and education level) of participants were collected using anonymous online questionnaire. Participants were invited to participate through social media. Data were analysed using IBM SPSS Statistics.

Results. The mean age of the participants was 30.6 years (SD = 5.15). 93.4% (n = 128) of participants used folic acid supplements (400mcg) during pregnancy and 6.6% (n = 9) did not. Of those who used folic acid, 38.3% (n = 49) started using it pre-conception, 10.9% (n = 14) during the first month of pregnancy, and 50.8% (n = 65) after the first month of pregnancy. 82.5% (n = 113) of participants reported their pregnancy as planned and 40.7% (n = 46) of them started taking folic acid pre-conception. The median time of initiation of folic acid supplements was 5 (IQR = 11) weeks of pregnancy and median duration of folic acid supplementation was 16 (IQR = 22) weeks. A weak statistically significant correlation was found between income level and the time of initiation of folic acid use. $r(128) = -0.251$; $p = 0.004$. No correlation was found between educational level and time of initiation of folic acid supplement use.

Conclusions. Most pregnant women were taking folic acid supplements during pregnancy. More than half of the women started using folic acid after the 4-week mark, which is inadequate for neural tube defect prevention. Time of initiation of folic acid use correlates with the level of income.

PATIENT WITH MULTIPLE PRIMARY MALIGNANCIES IN GENERAL PRACTICE

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Keywords. Multiple primary malignancies; Acinar; Adenocarcinoma; Neuroendocrine tumor; Liposarcoma

Introduction. Multiple primary malignancies are defined as more than one synchronous or metachronous cancer in the same individual. Metachronous cancers are more frequent than synchronous, with a ratio of 2.7:1. Reported frequency of multiple primary malignancies varies between 2%–17%.

Case Description. 75 years old male has been his general practitioner's patient for 25 years. In 2009 during routine control blood tests, Prostate-Specific Antigen was elevated. Biopsy and CT scan confirmed prostates acinar adenocarcinoma. The operation was planned, but on stationing, the patient had severe anemia. Treatment was continued with radiation and hormonal therapy. In 2012 patient had repeated anemia, which did not treat with medicine. It was decided to check occult blood in the stool – the test was positive. Colonoscopy, biopsy, and CT scan confirmed rectum adenocarcinoma. The patient had right-side hemicolectomy and tumor extirpation, afterward chemotherapy. In 2015 due to a different disease, the patient had a CT scan, which showed a mass in the abdomen. The patient had laparotomic extirpation, and the Institute of Pathology confirmed – liposarcoma. In 2021 the patient discovered another abdominal mass. The patient had another laparotomy extirpation and biopsy results confirmed liposarcoma recurrence. In 2022 the patient had anemia with thrombocytosis. It was decided to perform fibrocolonoscopy. In the stomach were polyps of which a biopsy was taken and confirmed neuroendocrine tumor. During CT scan three new masses were found in the abdomen. A biopsy was taken and currently waiting for answers.

Summary. During a period of 14 years, the patient had 4 different malignancies, with one recurrence and another currently being investigated. During this period the patient didn't give subjective complaints, only during control analyses and different pathology investigations were these malignancies discovered.

Conclusions. The possibility of multiple primary malignancies, as well as metastasis or recurrence, should be considered in patients diagnosed with malignancies.

PUBLIC HEALTH

ACTUALITY, ACHIEVEMENTS, AND PERSPECTIVES OF DISASTER MEDICINE

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Objectives. To evaluate the didactic process regarding the efficiency of the theoretical knowledge and practical skills of medical students in the liquidation of the medical-sanitary consequences of disasters. To assess the training process quality of the course– Healthcare Management of Disaster Victims. To enhance the theoretical and practical skill of medical students and doctors regarding health management of victims in various exceptional circumstances.

Materials and Methods. The research paper has a descriptive and observational character. The research data were gathered from homogeneous and representative groups of medical students selected by the mathematical method who filled in the questionnaires.

Results. The training process is performed at a high level. The lecturers use information technologies, PowerPoint presentations, video sources, examples from everyday life, references to specialized scientific studies, and interdisciplinary connections. Seminars are carried out by using interactive teaching methods: team building, role play, problem-solving activities, etc. Professionalism, positive attitude and objectivity of the teacher motivate the student to get theoretical knowledge and practical skills in Healthcare Management of Disaster Victims.

Lack of a modern simulation center for exceptional situations and insufficient seminar hours represent a threat to knowledge consolidation in the field Disaster Medicine.

Conclusions. Disasters that occurred in a relatively short period of time since the beginning of the XXI century have affected the population worldwide and called for new requirements regarding health management of medical-sanitary consequences liquidation of incidents with multiple victims.

The training process was highly appreciated by the beneficiaries. For the improvement of the students practical skills, it is necessary to increase the volume of practical work, and open a modern simulation center in order to practice the first aid provision, evacuation and victim assistance in various exceptional situations.

AEROBIC CAPACITY AND PHYSICAL ACTIVITIES OF STUDENTS OF THE STUDY PROGRAMME “PHYSIOTHERAPY”

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Objectives. Aerobic capacity is one of the objective indicators of the physical fitness level and overall state of health of any person and future physiotherapist. The aim is to analyze the aerobic capacity of physiotherapy students and its correlation with physical activities.

Materials and Methods. A total of 85.7% (n = 91) Rīga Stradiņš University study programme “Physiotherapy” 1. and 2. course students (n = 78; 85.9% female 22.2 ± 5.5 years and 14.1% male 20.6 ± 3.6 years) were analyzed. The study was done in 2022 from April to May. The World Health Organization test was used to determine aerobic capacity. It was performed on the cycle ergometer “Monark Ergonomic 839E”. The physical activities were determined using questions, that were conducted from a study which was done by the Centre for Disease Prevention and Control of Latvia “Health Behaviour among the Latvian Adult Population”. Descriptive statistical methods, Spearman correlation analysis, and the Kruskal-Wallis test were used for data processing.

Results. Aerobic capacity on average is VO_{2max} 33.6 ± 5.5 mL/kg/min for female students and 39.3 ± 7.8 mL/kg/min for male students and is considered below average. Aerobic capacity is below average in 68% of students, average and good in 32%, but very good and excellent in none of the students. Good aerobic capacity is only seen in those students who have hard physical training or competitions more often than once a week. Physical activities that are at least 30 min long with mild shortness of breath or sweating have a significant correlation ($r = 0.418$; $p < 0.001$) with aerobic capacity. The correlation between aerobic capacity and the time spent walking or cycling to work/educational institutions is very weak and not significant ($r = 0.068$; $p = 0.612$).

Conclusions. Most students' aerobic capacity is below average, but for students whose aerobic capacity is good, it mainly depends on the volume of sufficiently high-intensity physical activities (to mild shortness of breath or sweating).

AEROBIC CAPACITY OF APPLICANTS OF THE STUDY PROGRAMME “HEALTH SPORTS SPECIALIST” AND THEIR CHANGES DURING THE COVID-19 PANDEMIC

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Objectives. In recent years, pandemic restrictions have reduced people's physical activity, and getting sick with COVID-19 could negatively impact aerobic capacity, which is one of the most important indicators of physical fitness level and health.

The aim. To study the aerobic capacity of the applicants of the study programme ‘Health Sports Specialist’, their changes during the years of the COVID-19 pandemic, and the impact of getting sick with COVID-19 on the aerobic capacity of the applicants.

Materials and Methods. The participants of the study were applicants of the professional study programme “Health Sports Specialist”, aerobic tests were conducted in July – August 2019 (n = 74, 70.3% female) and 2022 (n = 73, 72.6% female). The World Health Organization cycle ergometer test was used to determine aerobic capacity, performed on the “Monark Ergonomic 839E” cycle ergometer. Collected data were analyzed using IBM SPSS version 27 statistical software.

Results. In 2019, VO₂max of all applicants was 36.7 (± 8.4) mL/kg/min. In 2022, the VO₂max of all applicants was 34.1 (± 8.1) mL/kg/min. During this time period, the participants' aerobic capacity (VO₂max) has significantly (p < 0.05) decreased by an average of 2.6 mL/kg/min (male by 4.2 mL/kg/min, female by 1.7 mL/kg /min), or by 7.1% (9.8% for male, 5.0% for female).

From July 1, 2021, until July 1, 2022, 46 (63%) applicants got sick with COVID-19, and 27 (37%) did not get sick. The median (Q1–Q3) value of aerobic capacity for applicants who fell ill is 33.8 (26.4–40.5) mL/kg/min, those who did not fall sick is 34.9 (29.4–40.1) mL/ kg/min. VO₂max was on average 1.1 mL/kg/min, or 3.2% lower in the sick respondents, however, this difference is not statistically significant (Mann–Whitney test, p = 0.420).

Conclusions. The aerobic capacity of the applicants had significantly decreased during the COVID-19 pandemic period, however, the decrease in aerobic capacity had not been considerably affected by becoming ill with COVID-19.

AGE DEPENDENCE OF VITAMIN B12 BLOOD LEVEL DIFFERENCE BETWEEN MALE AND FEMALE PATIENTS IN LATVIA

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Objectives. With the increase of popularity of B12 clinical tests proper reference intervals become more important. The male/female difference of B12 blood level was studied using large number of patient data.

Materials and Methods. Results of 391442 B12 tests accumulated at Egils Gulbis Laboratory, Latvia, from 1st of January 2018 till 21st of December 2022 were used in this study. Patient density distributions were studied for different age and gender groups. The highest number of data points per one year age interval were for 35 years old patients with 28619 and 9786 test results for female and male patients respectively. Gradually the number of tests per one year age interval decreased to 14000 test results for female and 6000 for male for the 75 years old patients. Mean B12 value, reference intervals and patient density distribution were calculated for each gender by 2 years steps.

Results. Up to the age of 45 the male and female adult B12 blood level is within 2% for median B12 value. At the age of 50 the B12 level for female patients is 10% higher than for the males. The difference between male and female B12 values reaches 13% at the age of 65 and stays around 10% until age 85. Similar changes with the age were observed for the whole patient density distribution including 1st and 3rd quadriles. Although B12 vitamin level depends on dietary habits and there are reports on lower of B12 level due to alcohol consumption it seems that there could be some physiological reason for the higher B12 blood level for women over 50.

Conclusions. A 10%–13% higher B12 blood level was observed females over 50 years old as compared to the males of the same age. The reasons for the difference are not clear.

ALZHEIMER'S DISEASE AND ESSENTIAL METALS AND METALLOIDS: HOSPITAL BASED CASE-CONTROL STUDY

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Objectives. There is some evidence that exposure to some metals and metalloids may be associated with an increased risk of Alzheimer's disease (AD). Some essential metals may promote beta-amyloid aggregation and plaque formation. The aim of the study was to estimate the concentration of essential metals and metalloids copper, zinc, manganese, and selenium in AD patients.

Materials and Methods. A hospital-based case-control study of AD risk factors was performed between March 2018 and March 2020 in two Hospitals of Lithuanian University of Health Sciences. The cases (n = 53) were patients aged 68–94 years with AD diagnosed within the study period. The controls (n = 217) were patients aged 53–93 years free from AD and dementia undergoing treatment for eye diseases. Copper and zinc in plasma, and manganese and selenium in blood were determined by inductively coupled plasma mass spectrometry. The results are presented in mean values (\pm standard deviations) that compared using t test. The level of statistical significance was set at 0.05. All reported p-values are 2-sided.

Results. In AD patients, plasma zinc and blood selenium were significantly lower compared to controls: plasma zinc was 66.0 ± 13.42 $\mu\text{g/dL}$ and 82.53 ± 30.54 $\mu\text{g/dL}$ ($p < 0.001$), blood selenium was 10.71 ± 2.37 $\mu\text{g/dL}$ and 14.38 ± 4.65 $\mu\text{g/dL}$ ($p < 0.001$), respectively. Meanwhile, blood manganese in AD patients was significantly higher than that in controls (1.17 ± 0.49 $\mu\text{g/dL}$ and 1.03 ± 0.30 $\mu\text{g/dL}$, $p < 0.01$). There was no difference in plasma copper concentration between cases and controls (102.81 ± 21.06 and 108.46 ± 21.37 , $p > 0.05$).

Conclusions. The data obtained show that manganese content in blood of patients with Alzheimer disease is greater compared to controls while zinc and selenium concentration is lower.

ANALYSIS OF DIETARY BEHAVIOUR IN PHYSICALLY ACTIVE PERSONS' COHORT

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Objectives. The main components of diet are proteins, carbohydrates and fats that are essential for vital processes support and renewal of energy expenditure, for successful physical activities outcomes (Lutz, et al., 2012; Wentz, et al., 2014). Individual dietary intake depended on nutrition education, knowledge and behaviour (Sygit, K., 2016). The aim of the study was to determine the effect of nutritional education on nutritional behaviour of respondents with standard BMI level and respondents with overweight BMI level based on dietary diary analysis of pre-course diet and post-course diet.

Materials and Methods. The study group included physically active respondents (N = 42) in aged 22–35 years. We provided anthropometric measurements, calculated body mass index and divided participants into: respondents with BMI < 25 and BMI > 25. Respondents participated in nutrition education course, and completed the three-day pre-course and post-course dietary diary questionnaire (Willett, 2013). The collected data allowed to calculate the amount of daily dietary components (proteins, carbohydrates) in pre-course diet and post-course diet as well total diet energy (in kcal). The statistical analysis was performed using IBM SPSS Statistics 27.0 version. Comparison between two BMI groups was undertaken using Mann-Whitney U Test because of the non-normal distribution of the data. P values < 0.05 were considered statistically significant. The study was carried out according to ethical rules for obtaining and processing data.

Results. Analysis of pre-course dietary diary showed no statistically exact significant difference of main components (protein, carbohydrates, fat) level in diet of respondents with overweight BMI and with standard BMI value. Analysis of post-course diet showed statistically exact significance of fat level (p = 0.011) and carbohydrates level (p = 0.002) in selected cohort of respondents.

Conclusions. Nutrition education has an impact on the choice of products and diet components. There are differences in diet of respondents with overweight BMI and with standard BMI value.

ANTI-JC VIRUS ANTIBODY PREVALENCE IN RIGA EAST UNIVERSITY HOSPITAL MULTIPLE SCLEROSIS PATIENTS

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Objectives. Multiple sclerosis (MS) is the most common demyelinating disease that can affect the brain and spinal cord. In Latvia there are around 2000 people living with MS. There is a possible development of progressive multifocal leukoencephalopathy (PML) in MS patients who are John Cunningham virus (JCV) positive and on disease-modifying therapies, specifically natalizumab. It is estimated that about 50–70% of the general EU (European Union) population has been exposed to JCV, but infection is generally asymptomatic in immunocompetent individuals. Aim of the study: Detect the prevalence of JCV antibodies among MS patients in Riga East University Hospital.

Materials and Methods. This is a retrospective study based on a database analysis of JCV serology index of 158 MS patients from Riga East University Hospital. The acquired data was analysed using IBM MS office Excel.

Results. A total of 158 MS patients (92 women, 66 men) aged 18 to 76 years from Riga East University Hospital were tested for JCV antibodies in serum in the period from 01.09.2019. to 18.10.2022. 104 (66%) patients had positive JCV antibodies. 7 (4.6%) patients were tested more than once. In all cases, JCV antibody status did not change with repeated testing. The minimal JCV antibody index in serum was 0.21, maximal index 4.87 and average 2.05 ± 1.52 .

Conclusions. Conclusion. Positive JCV antibodies among MS patients in Riga East University Hospital are detected as often as in the general EU population. No cases of JCV status change were diagnosed.

ASSOCIATION BETWEEN ACCESS TO HEALTHCARE AND HEALTH DURING COVID-19 AMONG THE ELDERLY IN LATVIA

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Objectives. Since COVID-19 pandemic has had a profound impact on many aspects of everyday life, including limited access to doctors and medical treatment, the aim of the study was to research the access to healthcare in relation to self-perceived health during COVID-19 among older population in Latvia.

Materials and Methods. Data from the Survey of Health, Ageing and Retirement in Europe (SHARE) with respondents aged 50+ of the Wave 8 COVID-19 Survey 1 and Wave 9 COVID-19 Survey 2 was analysed. Questions regarding self-perceived health, forwent, postponed, or denied healthcare were used to obtain and analyse information during the COVID-19 pandemic in Latvia. Pearson's chi-square test, T-test and logistic regression analyses were conducted to compare outcomes.

Results. The analysis of the first wave of COVID-19 in Latvia (N = 956) showed that 14.0% (95% CI 11.9–16.1) of the respondents forwent and 15.5% (95% CI 13.2–17.7) postponed medical treatment. Appointment was denied to 7.7% (95% CI 6.0–9.2) of the respondents in Latvia between March 2020 to June 2020. Odds to forgo, postpone or deny care were higher for those with fair or bad health (OR = 2.8 and OR = 1.8 respectively). The results showed that 7.8% (95% CI 6.0–9.3) of the respondents forwent and 3.5% (95% CI 2.2–4.6) postponed healthcare services between June 2020 to June 2021. Appointment was denied to 3.2% (95% CI 2.1–4.3) of the respondents at that time. Odds to forgo or postpone medical treatment were 2.8 and 1.8 times higher for those with fair or bad health. Data showed statistically significant age and gender difference depending on the treatment and reason for not receiving it.

Conclusions. The study indicates the importance of providing the elderly with sufficient confidence and possibilities to seek medical care, particularly for those with fair or poor health.

ASSOCIATION OF DEPRESSION AND ANXIETY WITH SEXUAL ORIENTATION IN CONVENIENCE SAMPLE OF LATVIAN YOUNG ADULTS

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Objectives. Investigation of Latvian young adult sexual orientation variability and its association with depression and anxiety.

Materials and Methods. Participants aged 18–30 year old ($n = 503$) were asked to do a self-administered anonymous web-based survey. To describe person's sexual orientation Kinsey scale was used. Prevalence of depression and anxiety, univariate and multivariate regression analysis was performed to measure relations between investigated factors.

Results. A total of 503 participants were included in the study. Mean (SD) value on the Kinsey scale was 1.4 (1.8) and median (IQR) value was 1.0 (0–2.0) where 0 is defined as 'exclusively heterosexual', 1 is 'mostly heterosexual, only slightly homosexual' person and 2 is 'mostly heterosexual, but more than slightly homosexual'. Prevalence of persons reported violence experience was 20.3%, anxiety 56.3% and depression 37.6%. Logistic regression analysis showed that experience of violence was associated with higher odds of developing anxiety and depression (OR: 2.6 [95% CI: 1.7–4.0] and 2.4 [95% CI: 1.5–3.9]). Being in relationship was associated with higher odds of developing anxiety (OR: 2.8 [95% CI: 1.3–6.3]). Male sex and income 1001–2000 euros a month were associated with lower odds of developing anxiety (OR: 0.4 [95% CI: 0.2–0.5] and aOR: 0.3 [95% CI: 0.1–0.8]). Sexual orientation showed no significant value in association with anxiety and depression (OR: 1.1 [95% CI: 1.0–1.2] and OR: 1.1 [95% CI: 1.02–1.2]).

Conclusions. Our study reported that only significant factor in developing depression and anxiety is experience of violence. Risk of developing anxiety is also increased in females, people in relationships but not married and with lack of income. Sexual orientation has no significance in association with depression and anxiety.

BURN-OUT SYNDROME IN ICU MEDICAL STAFF DURING THE COVID-19 PANDEMIC

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Objectives. Evaluation of the presence of BOS among medical staff in the ICU COVID-19.

Materials and Methods. The Maslach questionnaire, containing 25 items, was used. 31 medical workers from the COVID-19 ICU and non-COVID-19 ICU, within Timofei Mosneaga Hospital, were interviewed. 3 compartments were evaluated: emotional exhaustion, depersonalization and reduction of personal achievements.

Results. 10 doctors, 15 nurses and 6 auxiliary staff with an average age of 41 ± 10 years were investigated. Burn-out syndrome was identified in both research groups. The majority of doctors (60%) in the ICU COVID-19 registered a high level of emotional exhaustion and personal unfulfillment, while the other 40% reported medium levels. In the non-COVID wards, the majority of doctors – 80% showed signs of moderate emotional exhaustion, with no signs of high affect. The analysis of the nurses' questionnaires elucidated the following data: the greatest degree of emotional damage was presented by the nurses in the COVID-19 ICU – total 85.72%, of which 14.29% – high degree and 71.43% medium degree. No differences were determined amidst both groups of auxiliary staff regarding emotional exhaustion.

Conclusions. Burn-out syndrome is a phenomenon identified in ICU healthcare personnel. The most affected during the COVID-19 pandemic was the COVID-19 ICU medical staff. Doctors had the highest degree of emotional damage and personal unfulfillment, and the lowest degree was reported among auxiliary staff.

CHALLENGES IN PREVENTIVE HEALTHCARE FOR CHILDREN UP TO AGE 1 IN BULGARIA

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Objectives. Preventive care for young children is provided in the Children's Consultation (CC), led by a general practitioner and/or paediatrician in appropriate partnership with the children's families.

To monitor the organization and quality of preventive care for children under 1 year of age by identifying barriers to their provision and the role of the medical team in overcoming them.

Materials and Methods. A direct individual survey was conducted with 202 mothers of young children from three districts of Southern Bulgaria: Stara Zagora, Burgas and Kardzhali (November 2019 – June 2021).

A specially designed questionnaire is attached. SPSS v. 25.0 was used for statistical processing and data analysis.

Results. There was a high rate of 88.12% of children being seen in the SC, but also significant differentiation in terms of barriers to and within the team of health professionals involved in health care delivery. Mothers' satisfaction with nurse visits to their home and education with advice on nutrition and proper child rearing differed by ethnicity $P < 0.001$, education $P < 0.001$ and place of residence $P < 0.001$. Mothers emphasized the need for more frequent patronage visits to the home by a health professional. Statistically significant associations were found between the amount and quality of care with the level of education regarding various aspects of child-rearing knowledge and skills. 32% of the respondents were considered to be sufficiently knowledgeable about proper child rearing. The rest expressed willingness to increase their knowledge and skills in this regard.

Conclusions. In order to overcome the disparities in the care provided and to reduce knowledge deficits in certain groups of mothers, it would be essential to diversify and modernize the forms of cooperation with the families of the children, including strengthening the patronage activities.

CHARACTERISATION OF FREQUENCY OF NOROVIRUS INFECTION AMONG HOSPITALISED PATIENTS OF CHILDREN'S CLINICAL UNIVERSITY HOSPITAL IN 2021

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Objectives. To characterize the frequency of norovirus infection depending on where infection was acquired, age, sex, department profile, presence of other pathogens and socio-demographic factors among hospitalized patients of “Children's Clinical University Hospital” in 2021.

Materials and Methods. Data was taken from the Children's Clinical University Hospital internal information system *Andromeda* and the laboratory information system *DIALAB* about hospitalized patients in 2021 with a diagnosis of acute gastroenteropathy caused by norovirus (A08.1). A total number of included cases in the data analysis were 266 children aged 17 years and younger³. For statistical data analysis descriptive statistical methods and single-factor, multifactor binary logistic regression was used.

Results. The incidence of healthcare-associated norovirus infection (NoV-VASI) was 4.14 cases per 1000 hospitalized children per year. There were no statistically significant differences between socio-demographic factors, the presence of other pathogens and place where infection was acquired. The chances of becoming infected with NoV in the hospital's therapeutic profile departments were 3.99 (CI 2.07–7.69) times higher than in the departments of infectious diseases. Children with chronic illnesses and norovirus (NoV) infection were only in the NoV-VASI group (n = 10). In the NoV group acquired in the society, children were 5.24 times more likely (CI 2.71–10.13) to suffer from dehydration than in the NoV-VASI group.

Conclusions. The chances of hospitalized children to obtain NoV-VASI are related to compliance with infection control measures in departments of different profiles, not to the child's socio-demographic factors.

COGNITIVE IMPAIRMENT DURING SUBACUTE REHABILITATION PERIOD IN PATIENTS AFTER COVID-19 INFECTION

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Objectives. The aim of the study was to investigate cognitive impairment in patients undergoing subacute rehabilitation after COVID-19 infection.

Materials and Methods. The design of the study: Quantitative, descriptive study.

Participants: 32 patients after COVID-19 infection, who are receiving medical rehabilitation services at rehabilitation center “Jaunkēmeri” with cognitive impairment according to the Montreal Cognitive Function Assessment Scale (MoCA)

Procedure and data analysis: Patient evaluation with three RehaCom screening test modules – divided attention (GEAT), working memory (PUME) and memory for words (WOMT). Analysis of the obtained data was done by using descriptive statistical methods – percentage distribution and frequency, mean, minimum, maximum indicator.

Results. Patients with a medical history of COVID-19 infection experience impaired attention and concentration abilities, difficulty responding to auditory stimuli (19%) and visual stimuli (16%). Impaired word memory and learning abilities (9%) and work memory (28%). Cognitive impairments are not related to age or level of education.

Conclusions. COVID-19 infection affects the specific mental functions of the body – attention functions (b140), memory functions (b144) and thought functions (b160). RehaCom digital cognitive therapy program screening tests can be used as an additional assessment tool to set precise treatment goals and plan the treatment process, but additional screening modules need to be used to gain a better understanding of post-COVID-19 cognitive impairment.

COMMUNITY PHARMACY POLICY REFORM IN NOVA SCOTIA, CANADA DURING COVID-19

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Objectives. To discuss the legislative, policy and funding reforms undertaken in the province of Nova Scotia, Canada related to community pharmacy practice during the COVID-19 pandemic.

Materials and Methods. We searched published papers and policy documents from the Canadian Pharmacists' Association, Nova Scotia Department of Health and Wellness (NSDHW), Nova Scotia Health, Nova Scotia College of Pharmacists (NSCP), and Pharmacy Association of Nova Scotia websites.

Results. There are about 1500 pharmacists, 246 pharmacy technicians (PhT), and 315 pharmacies in Nova Scotia. During the pandemic, pharmacists provided medicines, medical devices, personal protective equipment, hand hygiene solutions, thermometers, and pulse oximeters. They dealt with COVID-19 related issues including treatment of symptoms and referral; discussion of the benefits and risks of COVID-19 vaccines and administered COVID-19 vaccines, nirmatrelvir/ritonavir assessments, prescribing of budesonide, and decreased the spread of misinformation about COVID-19.

Since 2010, the NSCP, the provincial regulatory body, has worked towards an expanded scope of practice for community pharmacists. Pharmacists have been authorized to administer drugs by injection since 2013. Of pharmacists practicing direct patient care in the community setting, 86% have an injection permit.

The NSCP worked with the provincial government to amend regulations to enable PhT to administer drugs by injection and assist with the COVID-19 vaccine roll out.

To administer vaccines, pharmacists and PhT had to complete required training and obtain an **NSCP** permit to administer drugs by injection. Pharmacists began administering COVID-19 vaccines in December 2020.

In May 2022, NSCP enabled pharmacists to prescribe inhaled budesonide following an established protocol for treatment of mild SARS-CoV-2 Respiratory Symptoms.

The Nova Scotia government provided reimbursement for community pharmacies for administration of COVID-19 vaccines, Paxlovid assessments, and inhaled budesonide prescribing for COVID-19.

Conclusions. Community pharmacists in Nova Scotia were a key part of the response to the COVID-19 pandemic in Nova Scotia.

COMPARATIVE ANALYSIS OF 12- AND 24-MONTH SURVIVAL OUTCOMES IN NON-SMALL-CELL LUNG CANCER PATIENTS IN LATVIA AND ISRAEL: INVESTIGATING DISPARITIES

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Objectives. Non-small-cell lung cancer (NSCLC) is a leading cause of cancer-related mortality globally. The WHO reports the age-standardized mortality rate from NSCLC for 2020 in Latvia at 19.7 and in Israel at 16.0 per 100,000 population. The objective of this study was to comparatively analyze the survival outcomes of Latvian and Israeli NSCLC patients at stages III and IV, 12- and 24-months post-diagnosis.

Materials and Methods. This retrospective study enrolled patients diagnosed with stages III and IV NSCLC between 2017–2020 from Shaare Zedek Medical Center (Israel) and Riga East University Hospital (Latvia). Demographic and therapy information were collected from patient records. Kaplan–Meier analysis was employed to evaluate the 12- and 24-month survival of patients in both clinics, stratified by cancer stage and gender.

Results. The study population consisted of 86 Israeli and 200 Latvian grade III and IV NSCLC patients. No significant differences were observed in the patients' age at diagnosis ($p = 0.73$). Survival outcomes were consistently better for Israeli patients across all strata. For grade III, the 12-month survival was 92.7% for Israeli and 40.4% for Latvian patients. The corresponding figures for grade IV were 95.2% and 23.0%, respectively. For 24 months, the survival rates were 84.9% and 21.2%, and 92.7% and 10.0% for grades III and IV, Israeli and Latvian patients, respectively. There were no differences in survival outcomes between genders.

Conclusions. This study reveals significant disparities in the 12- and 24-month survival outcomes of Latvian and Israeli patients diagnosed with NSCLC at stages III and IV. These results highlight the need for improved patient care and therapeutic strategies in Latvia to enhance survival outcomes for NSCLC patients.

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CONDUCTING RESEARCH PROJECT IN THE SITUATION OF COVID-19 PANDEMIC

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Objectives. In the countries of the WHO European Region, overweight and obesity are common problems in the population. From 25.11.2020 to 13.04.2021 the “Study on physical activity, dietary habits and body mass index for 5–6-year-old preschool children in Latvia” was implemented within the framework of European Social Fund project “Complex health promotion and disease prevention measures” (No. 9.2.4.1/16/I/001).

The objective of the presentation is to show how, using an innovative methodological approach, it is possible to achieve the research goal – to obtain representative, evidence-based information about the prevalence of overweight and obesity in preschool children, children’s physical activity, nutritional habits in Latvia, in the context of COVID 19.

Materials and Methods. The study includes 490 kindergartens attended by 16,624 children, using a stratified cluster sample.

The epidemiological situation caused by COVID-19 created risks for conducting the project. The researchers as unauthorized persons were not admitted in kindergartens. The research center SKDS created and used an innovative methodological approach to conduct research in extreme conditions. For the survey and conducting anthropometric studies by kindergarten personnel, a visual training material – an educational film – was created.

Results.

The following data were obtained:

1. Anthropometric data and information about children born in 2015 attending kindergartens. The number of surveyed children is 3,990.
2. Data of the survey of the employees of the kindergartens.
3. Survey data of children’s parents.

Conclusions. The application of the innovative research method gave Latvia, as the only European country, the opportunity to conduct the study under the conditions of COVID 19, clarifying the situation of obesity in children and the risk factors that contribute to it. The research results are the basis for recommendations for health care, education policy makers, as well as parents of children.

DETERMINANTS OF HEALTHY AGEING IN LATVIA AND ICELAND: METHODOLOGICAL APPROACH

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Objectives. The longer lifespan of the population is a valuable resource and offers significant opportunities for society, but these opportunities largely depend on the long-term health of the population. However, health and wellbeing of the elderly might be affected by unforeseen circumstances such as COVID-19 pandemics both in a short and also in a long term.

Materials and Methods. Rīga Stradiņš University is involved in a bilateral project with the University of Iceland “Modelling of the Impact of COVID-19 on Public Health of Elderly People in Latvia and Iceland” (agreement Nr. FM2021/23 (EEZ/NOFI/DIV) with an overarching aim to develop scientific cooperation between the countries to promote healthy ageing (HA). By using such databases on ageing populations as the “Study on Health, Ageing and Retirement in Europe” (SHARE) and Icelandic study on population ageing (HL20), we test and develop statistical modelling with innovative methods. In our approach, we outline HA determinants for each country separately and show differences between the societies, and then make the variables comparable using categories included in the WHO definition of HA. The novelty of this project lies in providing an example on how to define HA determinants when being limited to available survey questions.

Results. The developed model from the two databases for HA seems to be relevant to both Latvia and Iceland. The ageing processes at a certain point become similar disregard country and the welfare system etc. The explanatory value of the model is, however, not very high, which seems to imply that there are many more aspects that play significant role in HA.

Conclusions. Considerable attention has been paid to the limitations and benefits of our approach. We have an overall picture, but we need access to more specific variables that we seem to miss out in the current surveys, and develop new screening tools for ageing populations.

DIFFICULTY PERFORMING OCCUPATIONS IN SUBACUTE PERIOD IN PATIENTS AFTER COVID-19

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Objectives. To find out the difficulties of performing activities in the subacute period among patients who previously suffered from COVID-19.

Materials and Methods. Research design: quantitative, descriptive study.

Research participants: 50 patients after COVID-19 infection who received medical services in hospital, day hospital in subacute rehabilitation stage and had no cognitive impairment (SMMSI results 24–30 points).

Procedure and data analysis: patient evaluation using The Canadian Occupational Performance Measure (COPM). Analysis of the data performed using descriptive statistical methods – percentage distribution and frequency, averages. In the analysis of the gathered data, there was collected and summarized information about the difficulties of occupations among patients who previously suffered from COVID-19.

Results. In a group of patients who had suffered from COVID-19 infection, there were identified the difficulties in performing 20 daily activities, which were 40% leisure, 35% productivity and 25% self-care activities. The most important are productivity activities. The lowest performance is when doing leisure activities, with their performance, patients are also the least satisfied. A summary with identified pursuits was prepared.

Conclusions. Patients after suffering from COVID-19 infection identify the difficulties of performing all kind of activities based on purpose – self-care, productivity, and leisure. Among all identified difficulties, productivity activities were the most common (55%), followed by self-care (31%), leisure activities (14%). For each research participant receiving subacute rehabilitation services for patients after a COVID-19 infection, there were identified at least two daily activities, during which person experienced difficulties.

EFFECTIVE SEXUAL AND REPRODUCTIVE HEALTH AND RIGHTS EVIDENCE TO POLICY TRANSLATION: CASE OF THE ACADEMIC NETWORK FOR SEXUAL AND REPRODUCTIVE HEALTH AND RIGHTS POLICY (ANSER)

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Objectives. Shifting health priorities, fake news and increasing mistrust between academics and politicians are jeopardizing sexual and Reproductive Health and Rights (SRHR). Sound SRHR policymaking necessitates an evidence base to ensure effectiveness. But too often scientists and politicians speak a different language, making effective collaboration difficult. The academic looks for nuance and the complexity of things. The policymaker wants quick and efficient solutions for societal challenges. This can lead to misunderstanding and even mistrust. Connecting both stakeholders and improving evidence-based policy-making is therefore critical in realizing a sustainable impact on SRHR for everyone, everywhere.

Materials and Methods. In 2016 Ghent University launched the Academic Network on SRHR Policy (ANSER), an international research platform aiming to build the required evidence base to ensure SRHR policies are adequate and effective, ensure reliable follow-up and monitoring to increase the success of their implementation and initiate an exchange of knowledge between different types of stakeholders to improving existing approaches and policies.

Today 42 member institutions, including universities such as Riga Stradins University and non-profit organisations, covering 23 countries worldwide and multiple disciplines engage in joint research projects, weigh in on current policy debates and host innovative training programs. Based on evidence around effective knowledge translation to policy & by learning from experience the ANSER network got a niche position in linking academia and policymakers in SRHR.

Results. Over the years the network has shown how to be successful in impacting policy. The critical focuses are: the importance of making research findings more accessible to policymakers, connecting all stakeholders at all stages of the research, training both researchers and policymakers to increase awareness and build capacity around knowledge translation and increasing the relevance of research to policy.

Conclusions. Giving specific attention to academic outreach to policymakers can increase evidence-based policymaking and lead to a more sustainable impact on SRHR for everyone.

GOVERNMENT RESPONSES TO COVID-19 AND THE STATE OF DEMOCRACY IN LITHUANIA AND EUROPE – EVIDENCE FROM THE EUROPEAN SOCIAL SURVEY

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Objectives. The response to the COVID-19 crisis has become an unprecedented challenge for most governments. Various comparative studies of pandemic management measures (e.g., OECD, ILO) show that the preparation for the pandemic was insufficient, with high human, economic, and financial costs. Lack of information, low involvement of stakeholders and the public itself in risk-related decision-making led to decreasing trust in state institutions. Meanwhile, research shows that the effectiveness of public health measures is highly dependent on public acceptance and compliance.

Liberal democratic societies in Europe prioritize individual freedom, so especially in critical situations such as a pandemic, it is a challenge to balance the powers of the government and individual freedom. Such a situation encourages raising questions about citizens' trust in democracy and its quality. Especially since, in the face of crises, the trust in democratic political institutions usually decreases.

The aim of this presentation is to analyze how citizens' attitudes towards governments' management of the COVID-19 crisis, measured in ESS R10 module "Impact of COVID-19", related to satisfaction with the state of democracy in a country.

The statistical analysis of data from Lithuania and other European countries allowed us to assess how the respondents evaluate the governments' decisions in the fight against the pandemic: prioritizing health or the economy, government authority or personal privacy. As well as how they were personally affected by these decisions.

Nearly 30 percent respondents from Lithuania are satisfied with democracy and its quality in Lithuania. This satisfaction correlates with the respondents' economic situation and education: the higher the respondents' income and education, the more satisfied they are with the functioning of democracy. In comparison with other European countries, Lithuania's assessment is in the group of countries with an average democracy assessment score of less than five.

HEALTH CHANGES AMONG OLDER INDIVIDUALS IN EUROPE BEFORE AND DURING COVID-19 PANDEMIC

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Objectives. Early impact of the COVID-19 pandemic can be associated with changes in mental and physical health, but as the COVID-19 pandemic has challenged the capacity of healthcare systems in long-term it can potentially compromise other health outcomes as well.

The objective of the study was to evaluate changes in health before and during the COVID-19 pandemic.

Materials and Methods. The study was based on a sample of individuals from wave 7, wave 8, including COVID-19 add-on and wave 9 COVID-19-add-on of the Survey of Health, Ageing and Retirement in Europe (SHARE) in the period from 2017 till 2021.

The sample size was 38680 respondents from 24 European countries. Descriptive statistics and univariate binary logistic regression was performed.

Results. The proportion of respondents with poor or fair health status in 2021, compared to 2017, has increased from 0.2% to 10.5% with highest increase in Czech Republic (10.5%) and Bulgaria (8.1%).

The main predictors for fair or poor self-rated health (unadjusted OR; 95%CI) were age 75+ years (reference group 50–74 years) for Greece (5.73; 4.74–6.91), Latvia (5.08; 3.35–7.70), Slovakia (4.44; 2.92–6.75) and Lithuania (3.77; 2.85–5.00), nervousness for Romania (5.71; 4.44–7.35), Croatia (5.14; 4.14–6.37) and Hungary (4.18; 3.02–5.81), sadness or depression for Romania (6.01; 4.66–7.76), Croatia (5.40; 4.34–6.72) and Lithuania (4.54; 3.42–6.02), trouble sleeping for Romania (5.94; 4.64–7.62) and Slovakia (5.83; 4.30–5.84), loneliness for Latvia (9.13; 3.89–21.46), Cyprus (9.04; 4.32–18.90) and Bulgaria (8.99; 5.21–15.53), limitations or severe limitations due to health for Italy (16.85; 13.97–20.32), Romania (13.07; 9.94–17.18) and Denmark (12.75; 9.47–17.15).

Conclusions. The most important predictive factors for health change are related to age, physical and mental health factors for all countries. Factors associated with COVID-19 pandemic didn't show significant impact on health status, however health deterioration due to mental health factors could be intensified by the COVID-19 pandemic.

HIV/HCV ASSOCIATED RISK BEHAVIOUR AMONG PERSONS WHO INJECT DRUGS BY THEIR INFECTION STATUS

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Objectives. Due to similar transmission routes of HIV and hepatitis C (HCV) co-infection among persons who inject drugs (PWID) is high, 70%–83% in Europe. PWID with co-infection is considered a population with high-risk injecting practices. Understanding of risk behaviours may help to address better address PWID needs for harm reduction and disease prevention. The aim is to describe risk behaviour and its contexts among PWIDs with different HIV/HCV status.

Materials and Methods. Qualitative semi-structured interviews and focus groups conducted with PWID in January 2022. Participants sampled purposively according to HIV/HCV status: HIV/HCV co-infection (n = 7); HCV mono-infection (n = 5); HIV/HCV negative (n = 5). 2 focus groups, 1 interview and 6 telephone interviews were conducted. Descriptive coding was conducted according to the interview protocol. Research carried out within the 12th phase of the Drug User Cohort Study, by the Centre for Disease Prevention and Control of Latvia and NGO ‘DIA + LogS’.

Results. PWID risk with HIV and/or HCV infection were practicing unsafe injections on daily basis, while mono-infected practiced it in rare cases. Almost all infected persons admit to sharing syringes/needles repeatedly in a lifetime. Most PWID used household items instead of sterile injecting equipment. PWID with co-infection were using injecting equipment of unknown origin. PWID with HIV/HCV co-infection reported problems with obtaining sterile injection equipment in advance. Part of HIV/HCV infected persons were incarcerated during their lifetime, but only HIV/HCV co-infected reported drug use in prisons.

Conclusions. PWID with HIV/HCV co-infection and mono-infection practised unsafe injections and other high-risk behaviour. Infected PWID reported drug-injection-related problems they are facing while trying to maintain sterile injection practices.

IDENTIFICATION AND COMPARISON OF HEALTHY AGEING DETERMINANTS BETWEEN OLDER INDIVIDUALS IN LATVIA AND ICELAND SINCE COVID-19 PANDEMIC

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Objectives. The development and maintenance of optimal physical, mental health, social well-being and functional abilities in older adults are one of the most important determinants of healthy ageing. Early impact of COVID-19 pandemic can be associated with deterioration in mental health, but in long term COVID-19 pandemic can compromise other healthy ageing determinants as well.

Within a bilateral project “Modelling of the Impact of COVID-19 on Public Health of Elderly People in Latvia and Iceland” (agreement Nr. FM2021/23 (EEZ/NOFI/DIV) the first step is identification and comparison of similar healthy ageing determinants between both countries, including also factors associated with COVID-19 pandemic.

Materials and Methods. The data from “Study on Health, Ageing and Retirement in Europe” (SHARE) and Icelandic study on population ageing (HL20) were used. Descriptive statistics as well as Chi-Square test was performed.

Results. During the study we were able to identify similar healthy ageing determinants for both countries according to WHO definition. Compared to Iceland, Latvia had significantly larger proportion of respondents – aged 80+ years, with lower level of self-rated health, less participation in physical activities as well as higher levels of workout slow-down, loneliness, social isolation, and mental health deterioration since COVID-19 pandemic.

Conclusions. The further step of the project involves development of the Healthy ageing model for each country separately and evaluation of the scale of the impact of COVID-19 pandemic, using various statistical calculations (confirmatory factor analysis, regression analysis etc.) for several risk groups of population of Latvia and Iceland.

IMPACT OF SOCIOECONOMIC STATUS AND THE BIG FIVE PERSONALITY TRAITS ON SELF-RATED HEALTH AMONG THE LATVIAN POPULATION AGE 50+

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Objectives. Health status is usually measured by objective factors such as the presence of chronic diseases, disabilities, or long-term illness. However, single-item measures such as Self-Rated Health (SRH) are found to be a better predictor of health than objective factors because SRH reflects a multifactorial construct with a wide range of influences. Therefore, the purpose of this study is to examine the associated factors of SRH such as education level and employment status, demographic factors, and personality traits.

Materials and Methods. The analysis is based on Latvian data derived from The Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8 (n = 781). The multinomial logistic regression model was used.

Results. A quarter (23.9%, n = 187) of the study participants rated their health condition as good, while half (51.7%, n = 404) of the respondents rated it as fair. Among all Big Five Personality Traits, the highest median score was observed for conscientiousness (4.0, IQR 3.5–4.5) and agreeableness (3.5, IQR 3.0–4.0). For the rest of the indicators (extraversion, neuroticism, openness), the median score was 3.0. In multivariate analysis (adjusted for all independent variables simultaneously), good SRH was significantly negatively associated with only one personality trait: neuroticism (odds ratio (OR) 0.47, p < 0.001). Among the other factors, younger age was associated with a good SRH (OR 25.9 (p < 0.001) and 5.7 (p < 0.001) for age groups 50–59 and 60–69 years, respectively, vs. 80+) as well as higher levels of education (OR 4.2 (p < 0.001) and 3.0 (p = 0.001) for the higher and vocational education, respectively, vs. without higher or vocational education. The absence of chronic conditions increased the odds of good SRH 41.6 times (p < 0.001). While unemployment (vs. retirement) decreased the odds by 95.2% (OR 0.048, p < 0.001).

Conclusions. Good SRH in the Latvian population aged 50 and older is associated with neuroticism in parallel with a variety of socioeconomic and demographic factors.

IMPLEMENTATION OF THE “BEST BUYS” ALCOHOL CONTROL POLICIES IN LATVIA FROM 1990 TO 2020

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Objectives. Latvia has among the highest alcohol consumption per capita in Europe. This study aimed to review the implementation of the WHO “best buys” alcohol control population-level policies in Latvia from 1990 to 2020.

Materials and Methods. A review of national-level policies on alcohol taxation, alcohol advertising and availability restrictions enacted by the highest policy-making authorities between 1990 and 2020 was conducted by using the Database of Legal Acts of the Republic of Latvia.

Results. In 1993, the first restrictions on retail alcohol sales locations (kiosks, pavilions, sheds, and cars) were enacted followed by further restrictions. However, the restrictions had not been applied to on-premises sales locations. In 2020, revisions allowed online alcohol sales, which were banned in 2013. In 2002, the country-level restrictions on alcohol off-premises retail sales between 22:00 and 8:00 were implemented and the minimum age for purchasing all alcoholic beverages was established at 18 years. However, on-premises sales hours of alcoholic beverages have not been regulated in Latvia.

In 1995, alcohol advertising on TV and radio was prohibited, except for beer and wine. Since 2013, when outdoor advertising of all alcoholic beverages was prohibited, no additional restrictions on alcohol advertising or marketing have been enacted.

In 1994, the alcohol excise duty rates were changed to beverage-specific rates. Overall, 23 revisions on excise duty rates for alcoholic beverages were made from 1994 to 2020. However, the largest increase in excise tax for alcoholic beverages occurred during the economic recession in 2009. In general, the alcohol excise policy has not been consistent, taking into account the changes in inflation.

Conclusions. Throughout the studied period, several “best buys” for alcohol control have been adopted. However, more comprehensive restrictions on alcohol advertising, policies for decreasing alcohol affordability, and enforcing restrictions on alcohol availability should be implemented to reduce the high levels of alcohol consumption in Latvia.

INCIDENCE OF CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTIONS DURING THE COVID-19 PANDEMIC

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Objectives. The aim of this study was to evaluate the incidence rate of Central Line Associated Bloodstream Infections (CLABSI) in critically ill patients with and without COVID-19.

Materials and Methods. The prospective surveillance study included all patients admitted to COVID-19 and non-COVID-19 respiratory intensive care unit between 1 January 2021 and 28 February 2022 in Central Military Hospital SNP Ružomberok – Faculty Hospital. The criteria of Centre for Disease Control and Prevention's National Healthcare Safety Network (CDC-NHSN) were used for CLABSI definitions. Data were collected and analyzed using the International Nosocomial Infection Control Consortium (INICC) Surveillance Online System. Data analyses were conducted using SPSS for Windows Version 16.0.

Results. We analyzed the data of 312 ICU patients hospitalized for 3 671 bed days, with 7 483 central line (CL) days. 177 patients were given a diagnosis of COVID-19. The incidence rate of CLABSI was 5.65 per 1,000 CL days (11.89 per 1,000 bed days) in patients with COVID-19 infection and 3.29 per 1,000 CL days (5.98 per 1,000 bed days) in patients without COVID-19 infection. CLABSI rate per 1,000 CL days increased by 63.11% in patients with COVID-19 infection. Central line utilization ratio in patients with COVID-19 increased by 18.68% compared to patients without COVID-19. The main CLABSI pathogens were *Acinetobacter* sp. (26%), *Pseudomonas aeruginosa* (26%), *KLebsiella pneumoniae* (18%), *Enterococci* sp. (12%), *Streptococcus* sp. (6%)%, coagulase-negative Staphylococci epidermidis (8%) and others (4%). Increased length of stay and mortality were also observed in patients with CLABSI.

Conclusions. Significant increases in CLABSI rates were observed in patients with COVID-19. This data point to the need to increase the effort to provide surveillance of CLABSI and return to infection prevention.

INCIDENCE OF DEPRESSION AND ASSOCIATED OCCUPATIONAL FACTORS AMONG HEALTHCARE WORKERS DURING COVID-19 PANDEMIC IN LATVIA

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Objectives. During the first 6 months of the COVID pandemic, the prevalence of depressive symptoms in the population of health care workers (HCW) increased from 24.8% to 33.5% in Latvia. Aim of the study is to assess 6 months incidence of depression and associated occupational factors among HCW during COVID-19 pandemics in Latvia.

Materials and Methods. A longitudinal quantitative study in the population of HCW (physicians, physicians assistants, nurses and others) in Latvia was made in April-June 2022 with repeated interviews after 3 and 6 months. Participants were selected by non-probability sampling approach. Participants without symptoms of depression during first interview were included in further interviews.

Depression was assessed using Patient Health Questionnaire-9 (PHQ-9), cut-off score-10. Survey included occupational factors as work experience, workplace, profession and contact with COVID-19 patients. Data were analysed using the Chi-square test, analysis was performed using SPSSv25.

Results. 312 HCW were included in data analysis, of whom 86.9% (N = 271) – women, age median-44.0 (IQR 30.0–55.0). 19.2% (N = 60) HCW developed symptoms of depression during first 6 months of pandemics. Work experience more than 20 years was associated with lower incidence of symptoms of depression ($p = 0.042$), working in general practice was associated with higher 6 months incidence of symptoms of depression ($p = 0.031$). Age, gender, profession and contact with COVID patients were not associated with 6 months incidence of symptoms of depression ($p = 0.116$; $p = 0.185$; $p = 0.395$; $p = 0.562$).

Conclusions. 19.2% HCW developed symptoms of depression during the first 6 months of COVID-19 pandemics in Latvia. Working in general practitioners' office is occupational risk factor and higher work experience is occupational protective factor for incidence of symptoms of depression among HCW during first 6 months of COVID-19 pandemics in Latvia.

LINKS BETWEEN SELF-RATED HEALTH AND CIVIC PARTICIPATION IN THE BALTIC POPULATION AGED 50+

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Objectives. International scholarship has widely explored the reciprocal relationships between older adults' health and social activity (Kelly et al 2017). However, one type of social engagement, civic participation, is understudied. Research shows that social activity positively affects a person's health (Steptoe, Fancourt, 2019). Therefore, when considering how to maintain the health of older people through their involvement in the community, it is crucial to understand the current level of civic participation and the gaps in it. This study fills the gaps in scientific knowledge on the civic involvement of older adults with different self-rated health statuses in the Baltic countries.

Materials and Methods. The data comes from a quantitative survey of Lithuania's, Latvia's and Estonia's populations aged 50+ (N = 2015) conducted in 2019–2020. Data were analysed based on the typology of civic activity (Serrat et al 2020), other social indicators, and self-rated health status, using descriptive statistics, Hierarchical Regression and Factorial ANOVA analysis.

Results. The worse one's self-rated health, the lower the civic participation level: participation of 50+ men and women in poor health in various forms of civic activity is lower than that in good health (except for voting by men aged 50–64). The most extensive contrasts associated with self-rated health status are observed in the civic activity of the oldest men (65+). In the age group 50–64, women's participation in most forms of civic activity exceeds that of men. However, in the age group 65+, women's activity exceeds men's in voting only.

Conclusions. Self-rated health status is among the most vital indicators of older adults' civic participation level; selectively, it works together with other investigated indicators. The research results can be helpful for social policymakers and practitioners (social workers). A limitation of this study is that it includes only older adults living in a community.

NATIONAL TRENDS IN THE USE OF STATE-REIMBURSED FIXED DOSE COMBINATIONS WITH STATINS IN LATVIA (2012–2021)

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Objectives. Use of fixed dose combinations (FDCs) of statins with ezetimibe or with antihypertensive agents facilitate achievement of treatment goals set in guidelines. Our aim was to analyze statin FDC usage trends in Latvia over a ten-year period.

Materials and Methods. We analyzed all statin FDCs with ezetimibe or with antihypertensive drugs in a retrospective and longitudinal study using information from the National Health Service database on all state-reimbursed prescriptions from 2012 to 2021 in Latvia. The total number of units dispensed annually was calculated using the number of tablets or capsules in each package for each dose. High-intensity statin therapy was defined as atorvastatin 40–80 mg or rosuvastatin 20–40 mg. Version 22 of IBM SPSS Statistics was used to analyze the data.

Results. Among all dispensed statins, proportion of FDCs with ezetimibe grew from 0.21% in 2012 to 9.97% in 2021. After being commercially available in 2018, high-intensity statin FDCs with ezetimibe had an increase in dispensing rate from 0.94% to 6.81% by 2021. Among all dispensed ezetimibes, proportion of FDCs with statins quadrupled from 22.18% in 2012 to 92.46% in 2021.

Proportion of statin FDCs with one or more antihypertensive agents out of all dispensed statins continued increasing from 9.76% in 2012 to 15.10% in 2021. Among all statins, the proportion of statin combinations with one antihypertensive drug decreased threefold from 9.76% in 2012 to 3.69% in 2021, while use of statin combinations with 2 antihypertensive drugs increased from 0.19% in 2016 to 3.47% in 2021.

Conclusions. In Latvia, the use of statin FDCs in combination with other medications has greatly increased between 2012 and 2021, particularly when combined with ezetimibe and two antihypertensive medications. Combinations containing high-intensity statins are also increasingly used.

NON-VIOLENT DEATH ISSUE IN LATVIAN MEDICOLEGAL SYSTEM

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Objectives. According to Latvian legislation forensic autopsies are performed within the framework of the Criminal Law in cases of violent deaths, suspicions thereof and on unidentified bodies. If the identity of the deceased is established and death is non-violent it is reasonable to perform a hospital autopsy instead of a forensic autopsy or to issue a death certificate without an autopsy based on ambulatory medical records. However, given the fact that police don't have access to medical records of the deceased, forensic autopsies are ordered. The main goal of this topic was to determine the amount and types of non-violent death cases in Latvian forensic medicine and analyze the reasons for their increasing number.

Materials and Methods. Analysis of the reports of autopsies performed in Latvia State Centre for Forensic Medicine in 2021.

Results. 2611 autopsies were performed in 2021. 1119 (43%) of these were of violent death cases due to criminal and accidental injuries, extreme temperature, electricity and noxious chemical exposures, asphyxia and poisonings. 1160 (44%) were of non-violent death cases (increase by 309 cases in comparison to 2020) comprised by acute and subacute coronary heart disease (474), cardiomyopathies (298), acute abdominal conditions (119), pneumonia (72). In 332 cases (13%) the cause of death was not established due to corpse exposure to physical factors and late postmortem changes. In the majority of non-violent death autopsies the documentation provided by police did not contain any information indicating that the death could have been violent.

Conclusions. Within the given medicolegal framework not infrequently autopsy is the only option for determining the cause of death. A united digital medical data system available for all medical practitioners and police is required to optimize the work of forensic medical services in Latvia and decrease the number of forensic autopsies for non-violent death cases.

NURSING STUDENTS' ATTITUDES TOWARDS PARTICIPATION IN PROGRAMMES AIMED AT PREVENTION OF SOCIALLY SIGNIFICANT DISEASES

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Objectives. Nurses play a key role in the prevention of socially significant diseases. In this regard, it is important to form knowledge, attitudes and attitudes during the training of nursing students to participate in programs aimed at the prevention of socially significant diseases.

We aimed to explore nursing students' views on their attitudes towards participation in programmes aimed at preventing socially significant diseases.

Materials and Methods. In our report, we applied a literature analysis and a survey (direct anonymous electronic survey). The opinion of 50 second, third and fourth year nursing students of Medical University – Varna was studied. The study was conducted in December 2022. Graphical analysis was used to visualize the observed processes and phenomena. Microsoft Office was used to create the graphs.

Results. A significant proportion of nursing students confirmed their positive attitudes towards participation in programs aimed at the prevention of socially significant diseases. The majority of respondents said they would participate in such prevention programs as volunteers, driven by moral incentives and for their own satisfaction. More than two-thirds of the respondents said that they have relatives who are/ or have been ill with socially significant diseases.

Conclusions. The results of this study prove that nursing students realize the importance of their own role in the prevention of socially significant diseases and are willing to participate in prevention programs. The data highlight the need to further research in this area and to expand nursing roles and opportunities for preventive activities significant to the protection and maintenance of public health.

OPINIONS OF LATVIAN FITNESS TRAINERS ABOUT THE IMPACT OF SLEEP AND PHYSICAL ACTIVITIES ON SLEEP QUALITY

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Objectives. To find out the sleep habits and opinions of Latvian Fitness Trainers about the impact of physical activity on promoting quality sleep

Materials and Methods. Quantitative research. 40 certified Health Sports specialists/fitness trainers participated in the study: aged 24–50, 28 women and 12 men. The survey was performed remotely on the Google platform. Google form and MS Excel were used for data processing.

Results. 95% of respondents believe that the quality of sleep is affected by various factors, and one of them is physical activities of various intensity, which significantly improve the quality of sleep with the exception of HIIT workout before sleep. 97% of respondents rate their sleep quality as very good, good and satisfactory. Most of the respondents conduct trainings 3–6 hours a day, in addition, they themselves engaged in physical activities 3–4 hours a week. Almost half of the respondents spend 6–7 hours a day sleeping, 37.5% 7–8 hours, 40% of respondents manage to fall asleep in 15–30 minutes, 32.5% in up to 15 minutes and 27.5% in 30–60 minutes. 45% wake up only with the help of alarm clock: 25% wake up 1 time a night, 20%, 7.5% 2–3 times and 2.5% more than 3 times a night, which indicates a sleep disorder; 67.5% of respondents do not sleep during the day, 25% sleep for 15–30 minutes and 7.5% for 30–60 minutes.

Conclusions. The quality of sleep depends on several factors: the environment, physical activity, sleep mode and others. The majority of respondents believe that physical activities performed at different times of the day improve sleep quality, except for HIIT workout before sleep, which significantly worsens sleep quality. The interaction between physical activities and sleep is direct: physical activities improve sleep and quality sleep promotes the ability to perform physical activities of various intensities.

OUTFLOW OF MEDICAL PRACTITIONERS FROM LATVIA AS A CONSEQUENCE OF FREE MOVEMENT OF LABOUR WITHIN THE EUROPEAN UNION

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Objectives. The aim is to analyse and understand the main causes of out-migration of medical practitioners and the resulting impact on the health sector in Latvia as a whole, based on research of literature and sources, theoretical foundations of labour force and migration.

Materials and Methods. The following research methods are applied: 1) monographic method, statistical data analysis, analysis of laws and regulations, as well as court judgments (analysis of the Constitutional Court judgment, which assesses the 3-year work obligation for residents after completion of residency in the context of respect for fundamental rights); 2) retrospective analysis methods; 3) qualitative methods (situational analysis and author's observations); 4) quantitative method.

Results. The study shows that labour is a precious resource that can become irretrievably depleted when negative conditions prevail in a country.

Migration is a complex social process. The main factors contributing to migration are economic, socio-political, demographic and environmental.

Conclusions. The study confirms that financial considerations are the main reason for the emigration of medical practitioners, but it is not the only one. There are also reasons such as better career opportunities, opportunities to work with high-level technologies, social security, work environment and culture, better quality residencies, etc.

The urgent need is to reduce the outflow of medical practitioners, remuneration in the public sector needs to be increased rapidly and substantially.

PARENTS' OPINION ABOUT THEIR SON'S VACCINATION AGAINST HPV: QUALITATIVE STUDY

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Objectives. Vaccination of 12–14 years old boys against Human Papillomavirus (HPV) is included in the National Immunization schedule of Latvia since 2022. Vaccination of girls was provided since 2010. HPV infection is the most frequent sexually transmitted infection. Gender neutral vaccination is recommended to ensure herd immunity and to prevent diseases caused by HPV, including, warts, papilomas and cancers. The major role in information provision for parents and invitation to vaccination in Latvia is from GP practices. The aim of this study was to determine boy's parents' opinion about their son vaccination against HPV and to invite them to vaccination.

Materials and Methods. A cross-sectional qualitative study was carried out in October–December 2022 in Riga, Latvia, in a GP practice. We invited 32 parents of 12–15 years old boys to individual semi-structured interviews. Inductive thematic analysis was used.

Results. In total 30 out of 32 parents took part in the study. Predominantly females (n = 28), average age 44 years old. None of respondents knew which cancers are associated with HPV in men, some wrongly guessed prostate cancer, some thought that men can only carry the virus. Less than a half of participants (n = 14) agreed to vaccination right after interview; main arguments to vaccinate were protecting their son against HPV associated disease and trust in GP's recommendations. Parents who disagreed, were either concerned about usefulness and side effects of the vaccine or were against vaccines in general. Almost all respondents mentioned that there should be more information.

Conclusions. This study brought out that there is limited knowledge about HPV associated diseases and benefits of the vaccine in men, and this might affect decision making, especially in vaccine doubters. There are still concerns about vaccine safety.

PERCEIVED SUSCEPTIBILITY OF HIV/HCV INFECTION RISK AMONG PERSONS WHO INJECT DRUGS

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Objectives. Injecting drug use is one of the main HIV transmission routes in Latvia. Similar HIV/HCV transmission routes cause co-infection among persons who inject drugs (PWID). However, perceived risks of HIV/HCV may differ between PWID with different health status. A person's subjective perception of the risk of acquiring HIV/HCV may determine their patterns of drug injection and co-infection risk. The study aims to explore the perspectives of PWID on the perceived susceptibility to acquiring HIV/HCV by their infection status

Materials and Methods. In January 2022, qualitative semi-structured interviews and focus groups were conducted with PWID. 2 focus groups, 1 interview and 6 telephone interviews were conducted. Purposive sampling was used to select participants according to HIV/HCV status: HIV/HCV co-infection (n = 7); HCV mono-infection (n = 5); HIV/HCV negative (n = 5). The interviews were transcribed verbatim and manually coded using descriptive coding technique. Research carried out within the 12th phase of the Drug User Cohort Study, by the Centre for Disease Prevention and the Control of Latvia and NGO 'DIA + LogS'.

Results. Perceived susceptibility of HIV/HCV infection risk is one of the identified topics related to risk behaviour and its contexts. Infected PWID reported poor knowledge and understanding of HIV/HCV transmission modes. PWID with co-coinfection tended to overestimate their level of knowledge. Most PWID rate their risks of HIV/HCV transmission as minimal. Although they are aware of the risks, they may not attribute it to themselves and may underestimate their personal risk. Infected persons may become indifferent to their health after being diagnosed with HIV/HCV.

Conclusions. PWID rate their risks of HIV/HCV transmission as minimal, while reporting poor knowledge of the transmission risks. The study results provide evidence on the discrepancies of HIV/HCV perceived susceptibility among PWID. Better harm reduction service provision and communication with PWID can be provided, considering their perceived susceptibility.

POTENTIAL BENEFITS OF REMOTE PHYSIOTHERAPY ON THE LEVEL OF DAILY PHYSICAL ACTIVITY AND PARTICIPATION IN PEOPLE WITH PARKINSON'S DISEASE: MULTIPLE-CASE STUDY

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Objectives. It is known that physiotherapy improves the state of health and delays functional impairments in persons with Parkinson's disease (PD) but limiting factors for participation in face-to-face physiotherapy have been identified.

Aim: To analyze the applicability and outcomes of remote physiotherapy in daily physical activity and participation levels in persons with PD.

Materials and Methods. A multiple case study design was applied. Four persons with PD with stable medical condition and drug therapy participated. According to therapy guidelines for persons with PD an exercise program was created, which was performed remotely twice a week for eight weeks. Before and after the intervention data was collected by an accelerometer for seven consecutive days and with the "Impact on Participation and Autonomy" questionnaire, during the intervention – exercise evaluation protocol, and after the intervention – semi-structured interviews. Data were analyzed descriptively within a single case and cumulatively.

Results. All participants attended at least 10 sessions. Partial execution of the exercises was observed only in the first sessions and could be associated with an inferior understanding of the technical execution of the exercise. A loss of balance was observed in the first and final sessions, but it did not lead to fall and balance was regained easily. After intervention a tendency of increase time spent in physical activities (1–4%) was observed, with the largest increase of time spent in moderate intensity (6–131 min). A tendency of decrease in participation restrictions was observed – mostly in activities at home and outside. Participants reflected positive benefits such as an increase in self-efficacy in performing activities, improvement of health and a desire to engage more in daily physical activities.

Conclusions. It can be hypothesized that remote physiotherapy is applicable and provides positive benefits in the level of daily physical activity and participation in persons with PD.

PREVALENCE AND RISK FACTORS OF MUSCULOSKELETAL DISORDERS AMONG NURSES IN SLOVAKIA: CROSS-SECTIONAL STUDY

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Objectives. The primary aim of the study is to identify the prevalence of MSD among nurses in Slovakia in the context of demographic characteristics, BMI and physical activity.

Materials and Methods. Musculoskeletal disorders (MSDs) affect up to 91.5% of healthcare workers and are considered the primary health risk at work, leading to absenteeism, early retirement and lower quality of life, as well as the quality of healthcare delivery. A cross-sectional study was conducted online among healthcare professionals using the Nordic Musculoskeletal Questionnaire. Healthcare workers were randomly selected in the territory of Slovakia 921 patients with at least 1 year of experience were included in the study. in the outpatient clinic (questionnaires were filled in by 24 men and 897 women).

Results. The prevalence of MSD in the last 12 months was 91.5%. The most experienced pain was in the lumbar part of the back in 73.9%, in the cervical spine in 66.3%, followed by the thoracic spine in 42.2%, and the fingers of the upper limb were the least affected in 14.7%. There were significant differences in MSD prevalence among nurses, with a tendency to increase with increasing age and years of service. Pain intensity in all musculoskeletal MSDs, especially ankle pain, is related to BMI. The analysis revealed that there is only a difference in thoracic spine pain and MSD prevalence between nurses who work mainly at the bedside and nurses who work both at the bedside and in the clinic ($U = 28769.000$, $Z = -2.698$, $p = 0.007$).

Conclusions. Overall, the findings of the current study indicate a high prevalence of MSDs among healthcare workers. Findings from this study may help in the adoption of preventive measures to reduce the burden of back pain among nurses. Future studies should focus on ergonomic risk factors for MSD and to design preventive measures to reduce the burden of MSD.

PREVALENCE OF CHRONIC DISEASES DUE TO THE NATURE OF EMPLOYMENT AMONG ADULT POPULATION IN SLOVAKIA: CROSS-SECTIONAL STUDY

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Objectives. The aim of the study was to evaluate the prevalence of chronic diseases in the adult population with respect to age of respondents and to verify whether this prevalence is influenced by the nature of employment.

Materials and Methods. 735 respondents (146 men and 589 women) with an average age of 37.79 ± 13.6 years participated in this a cross-sectional study. The methodology of the study was an online questionnaire, which was distributed to respondents from all 8 regions of Slovakia. The main monitored characteristic were chronic diseases and their associations with the age and nature of employment. The respondents could characterize their job as: sedentary job, more sitting than movement, sitting and movement are in balance and no sitting at work only movement. The prevalence of chronic diseases was assessed as the number of chronic diseases confirmed by a doctor. Relations were verified by the Chi-square test ($p > 0.05$).

Results. There is a significant difference in the prevalence of chronic diseases in individuals under and over 40 years old ($\chi^2 = 68.988$; $df = 10$). Individuals under the age of 40 responded no chronic disease in 70% of cases, 24% had one, 3% had two, and 2.5% had three chronic diseases. Individuals over 40 years of age have no chronic disease in 40% of cases, 31% have one, 18% have two and 10.5% have three or more diseases. Relationship between the prevalence of chronic diseases and the nature of employment confirmed there is no significant difference in the prevalence of chronic diseases with respect to the level of movement at work ($\chi^2 = 5.587$; $df = 9$; Sig..780).

Conclusions. The age of 40 has been confirmed as a risk for the prevalence of chronic diseases. This prevalence is equal both in people with sedentary non-sedentary jobs.

Developed within: 003 KU-4/2021 Accelerated forms of rehabilitation procedures after surgical procedures

PREVALENCE OF HUMAN PAPILLOMA VIRUS IN LATVIAN POPULATION IN YEAR 2022

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Objectives. According to statistics, cervical cancer is one of the most commonly diagnosed types of cancer in the world and in Latvia as well. Human papilloma virus (HPV), which is the causative agent of cervical cancer, is one of the most frequent viral infections of the reproductive system and can be easily diagnosed. To reduce the incidence of cervical cancer, a nationwide screening program is of a great importance.

Materials and Methods. Data on the women who have responded to national screening program in Latvia were gathered in SIA “Centrālā laboratorija” from the 1st of July, 2022 until the 1st of December, 2022. High-risk HPV type DNA testing was done by Cobas 6800, Roche. This test system detects and differentiates HPV type 16, 18 and makes a pull of other high-risk HPV types (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 or 68). The amount of high-risk HPV DNA positive samples were estimated and compared to the prevalence of high-risk HPV types globally.

Results. Overall 22 207 high-risk HPV DNA tests were performed. It was calculated that 11.1% of the received samples were positive to at least one high risk-HPV type. These single-type HPV infections are more common than multiple-type HPV infections. Calculated co-infection rate was 0.9% in the analyzed samples in a given period of time. The current global HPV prevalence is estimated to be 11.7%.

Conclusions. Testing data indicates that the prevalence of high-risk HPV types in Latvia is comparable with the global average. Testing with molecular diagnostics methods provides valuable statistical data that helps evaluate the prevalence of high-risk HPV in Latvian population. From the gathered data grounded conclusions can be drawn about necessary actions that need to be taken in order to reduce the rate of prevalence of cervical cancer in the upcoming years.

PREVENTIVE HEALTH BEHAVIOR IN LATVIAN SOCIO-DEMOGRAPHIC GROUPS DURING THE SECOND WAVE OF THE COVID-19 PANDEMIC

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Objectives. The ongoing COVID-19 pandemic has once again raised questions about the preventive behavior. The spread of the coronavirus is still relevant and dangerous for risk groups in society (WHO, 2022). It is important to understand preventive health behavior to predict and reduce threats to Latvian society, but there are few such studies in Latvia. The aim of this study was to examine preventive health behavior of COVID-19 in various sociodemographic groups of Latvia.

Materials and Methods. 642 respondents from Latvian population (age 18 to 95) participated in the study ($M = 49.93$; $SD = 18.22$), (53.9% of female) divided into age groups 18–44 years (42.2%), 45–64 (34.1%) and 65 < (23.7%). 15.7% of respondents had primary or lower level of education ($n = 101$), 29.9% had higher education level ($n = 192$). 33.5% of respondents were from region of Riga ($n = 215$). All respondents filled out a demographic survey (data on gender, age, education level and residence in the region) and “COVID-19 related preventive health behavior” scale (Krumina et al., 2022). Data collection was performed through TNS Latvia Ltd during the second wave of pandemic within the EUF project “Complex health promotion and disease prevention measures” (Id. No.9.2.4.1/16/I/001) and later data analysis was performed.

Results. Results showed statistically significant gender differences in COVID-19 preventive behavior ($p < 0.01$) using Mann–Whitney test. Men had lower indicators in social distancing and compliance with hygiene recommendations. Kruskal–Wallis test presented that in general, younger people, respondents with primary level of education and residence outside of Riga and Pieriga have lower indicators in COVID-19 preventive behavior.

Conclusions. The results of this study can help to identify risk groups of society and can be used in the professional work of psychologists for more effective psychoeducation of clients/patients.

PROBLEMATIC SOCIAL MEDIA USE AND GAMING IN ASSOCIATION WITH SELF-PERCEIVED FAMILY SOCIOECONOMIC STATUS AMONG LATVIAN ADOLESCENTS

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Objectives. Behavioural addictions are relatively understudied, but their relevance has grown in recent years. Some previous research have shown that problematic gaming and social media use can lead to different adverse health outcomes such as anxiety, depression, risk for substance use and others. However, the prevalence of behavioural addictions varies between countries and sociodemographic groups of adolescents. The aim of the study was to analyse the prevalence of problematic social media and gaming and explore the associations with sociodemographic factors among adolescents in Latvia.

Materials and Methods. Data from nationally representative sample of Latvian adolescents aged 15–16 were used ($n = 2743$) that were collected within the European School Survey Project on Alcohol and Other drugs (ESPAD) in 2019. To identify problematic social media use and problematic gaming “Self-perceived problems related to Social Media/Gaming” scale was used. Independent variables on adolescent gender, age and educational level of parents and self-perceived family socioeconomic status were studied. Logistic regression models were used to explore the associations between problematic behavioural addictions and sociodemographic factors.

Results. Slightly more than half of the respondents who answered questions about social media use were problematic social media users (50.6%), while 23.1% were problematic video game players. Boys had 5.4 times higher odds for problematic video game playing than girls, while girls were 1.7 times more likely to be problematic social media users ($p < 0.01$). There were no statistically significant associations between problematic social media use and gaming and education level of parents. Adjusted for gender, problematic gaming was not statistically significantly associated with family well-off, but adolescents whose family were worse-off had 1.4 times higher odds for problematic social media use than adolescents whose family were better-off ($p < 0.02$).

Conclusions. The prevalence of problematic gaming and problematic social media use is high among adolescents in Latvia, and it is statistically different in socioeconomic groups.

PROMOTING SEXUAL AND REPRODUCTIVE HEALTH (SRH) AMONG ADOLESCENTS THROUGH PEER-TO-PEER EDUCATION

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Objectives. Promoting the specific values and rules concerning SRH in order for the teenagers to develop responsible and analytical thinking, and increasing the spread of correct information among adolescents regarding SRH.

Materials and Methods. The group of participants was made up of 53 teenagers, aged between 14–21 years, from 16 regions of the Republic of Moldova, of which 9 were Ukrainians (%) and 44 were Moldovans (%). The information sessions were organized by Y-PEER Moldova, in collaboration with the University of Medicine.

Results. Various SRH topics were discussed, and the teens acquired and enjoyed the information about the anatomy and physiology of the reproductive system, STDs and HIV/AIDS, contraception methods, etc. At the beginning of the training, only 24% of teenagers knew what “peer-to-peer education” meant. In the end, their number increased to 71%. The number of young people who could list most of the physical, mental, and hormonal changes increased 3.3 times. If at the beginning of the training, only 29% of teens offered an incomplete answer about SRH, at the end of the training 61% had objective knowledge. After completing the training, 27% had a solid comprehension of STDs and 37% knew how to prevent them vs. 5%, and 22% before the training. Apprehension concerning truthful information about HIV/AIDS increased from 20% to 46%. Correct understanding of the term “the right age to start sex life” also increased 8 times (5% vs 63%). Teenagers became familiar with various methods of contraception (32% at the beginning of the training and 85% after the training), and 64% of young people correctly assessed the signs of pregnancy

Conclusions. SRH is still a controversial topic in our society, but developing correct thinking early on will remove the effects of a misinformed society and contribute to its prosperity.

RAPID REINTEGRATION OF PATIENTS AFTER LUMBAR SPINE SURGERY INTO SOCIOECONOMIC LIFE

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Objectives. The aim of the study was to find out the reintegration of patients after lumbar spine operation into the socioeconomic life by means of an enhanced recovery rehabilitation approach.

Materials and Methods. The anonymized analyzed set consisted of 92 patients after lumbar spine surgery. The majority of the examined patient sample consisted of women (n = 72, 78.28%), men n = 20 (21.74%). The average age of the patients was

44.69 ± 5.6 years. The patient sample was divided into three categories depending on the time since surgery (< 5 years, 5–10 years, > 10 years). A non-standardized questionnaire consisting of categorization questions, questions focused on daily life activities and economic questions was used for data collection. Relations were verified by the Wilcoxon paired test and Chi-square test (p > 0.05).

Results. The results of the survey within the monitored sample confirmed (using the Chi-square test) the feeling of change in the personal economic situation (73%; 95%CI = 63.73–82.39%; $\chi^2 = 21.043$; df = 1; p < 0.001) however the hypothesis of a possible forced job change was not confirmed (48%; 95%CI = 37.37–58.23%; $\chi^2 = 0.17391$; df = 1; p = 0.6767). However, we can observe an improvement in the quality of social life in patients after lumbar spine surgery compared to before surgery (Wilcoxon-test: z = -2.976; p = 0.0029; median before = 0 [mean]; median after = 1)

Conclusions. The deterioration of the economic situation is perceived by patients after lumbar spine surgery as the main negative. Using the enhanced recovery rehabilitation approach, however, they perceive their personal social life to be much better than before the operation, as they have become more integrated into social life and have begun to devote themselves more to physical activities.

Developed within: 003 KU-4/2021 Accelerated forms of rehabilitation procedures after surgical procedures

RELATIONSHIP BETWEEN PSYCHOSOCIAL FACTORS AND AFFILIATE STIGMA IN PARENTS OF CHILDREN WITH ADHD: SYSTEMATIC LITERATURE REVIEW

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Objectives. The aim of this systematic literature review was to identify the psychosocial factors which are related with affiliate stigma in parents of children with ADHD.

Materials and Methods. Five databases, including MEDLINE, Academic Search Ultimate, Education Source, ERIC and PsychArticles, were searched for scientific articles. Relevant studies were selected by screening the titles, abstracts and full texts. The agreement between two reviewers was good (Cohen's kappa = 0.87). English language publications from 2008 to 2022, which present the results of quantitative studies on the relationship between psychosocial factors and affiliate stigma in parents of children with ADHD were included in this review.

Results. According to eligibility criteria, 7 articles were included in the review. The results showed that higher parental affiliate stigma is associated with lower parents' psychosocial functioning (higher expressed depression, anxiety, lower self-esteem). It was also found that higher parental affiliate stigma is related to unfavorable behavior towards a child (higher expressed negativity/ less constructive parenting). The results also showed that higher parental affiliate stigma is associated with more expressed child's difficulties (ADHD symptoms/ internalizing and externalizing difficulties)

Conclusions. These findings could be useful in providing help for families of children with ADHD. The results contribute to better understanding of parental affiliate stigma.

RELATIONSHIP BETWEEN SCHOOL'S ORGANISATIONAL FUNCTIONING AND TEACHERS' WORK-RELATED WELLBEING

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Objectives. This study aims to explore how the organizational factors of a school affect teachers' work-related wellbeing, that is, their job satisfaction and job insecurity

Materials and Methods. Employing a quantitative research method, data were collected from 33 schools in Lithuania, the final sample consisted of 292 teachers. Instruments used: organizational diagnostic questionnaire (ODQ, Preziosi, 1980), job satisfaction (Bowling, Hammond, 2008), job insecurity (De Witte, 2000).

Results. The results of the study show that teachers' job satisfaction is positively and the job insecurity is negatively significantly related to the following organizational factors: organizational goals, structure, rewards, helpful mechanisms, leadership, ethical organizational climate and employees' relations. Attention should be paid to the role of the school head in fostering the well-being of teachers, especially his support to teachers. Another important aspect is the relationship between teachers: teachers who are characterized by higher work related well-being are more satisfied with the relationships in the organization.

The results showed that teachers' psychological empowerment mediates the relationship between school organizational functioning and teachers' work-related wellbeing. With more favourable organizational factors, psychological empowerment increases, and with greater psychological empowerment, job satisfaction increases. Also, with more favourable organizational factors, job insecurity decreases, that is, more favourable organizational functioning is associated with greater psychological empowerment, and greater psychological empowerment reduces insecurity at work.

Conclusions. The findings of this study show the importance of human resource management for teachers' work-related wellbeing. By ensuring effective organizational functioning and empowering teachers, school leaders can foster teachers' work-related wellbeing. It should be noted that this is especially important for schools operating in a low SES context, as the lack of teachers in such schools is mentioned by school leaders in most of the countries.

RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC FACTORS AND VACCINATION INTENTION IN ADULTS IN LATVIA DURING THE COVID-19 PANDEMIC

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Objectives. Vaccination against various illnesses is a global health development success story that saves millions of lives each year and reduces the risk of developing various infectious diseases (WHO, 2022). The COVID-19 pandemic drew world wide's attention to infectious diseases and vaccination behaviour, including factors which are related to vaccination intention. Previous studies have found out that there is correlation between age (Jacob et al., 2021), level of education (Jantzen et al., 2022; Truong et al., 2022) and vaccination intention during the COVID-19 pandemic. So, the aim of this study was to determine relationship between vaccination intention and sociodemographic factors in adults in Latvia during the COVID-19 pandemic.

Materials and Methods. The study included 539 respondents (52.9% males), aged 18 to 75 ($M = 45.35$, $SD = 15.70$) who were not vaccinated against COVID-19. They were selected from a sample representative of the Latvian population surveyed by the INTERFRAME-LV study ($N = 1017$). The data was collected using demographic data questionnaire (gender, age, education, occupation, marital status, children under 18, place of residence, spoken language) and one item to assess vaccination intention. Data was collected in September 2021 by conducting direct interviews at the respondents' residences. The data were analyzed using Spearman's rank correlation coefficient.

Results. Statistically significant positive correlations were found only between level of education and vaccination intention ($r = 0.09$, $p < .05$). Considering the sample size, the correlation coefficient obtained is very low and suggests that the relationship between education level and vaccination intention is close to zero.

Conclusions. Despite the results of other previous studies, there is no statistically significant, strong association between education level, age and other demographic factors with vaccination intention in Latvia in the sample of unvaccinated adults during the COVID-19 pandemic. Future research should address relationship between vaccination intention and different psychological factors.

RESPIRATORY SYNCYTIAL VIRUS AND RHINOVIRUS DOMINATE THE DIVERSE LANDSCAPE OF RESPIRATORY VIRUSES DURING THE THREE MONTHS PRIOR TO THE INFLUENZA EPIDEMIC OF THE 2022–2023 SEASON IN LATVIA

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Objectives. A methodical surveillance network for viruses transmitted by the respiratory route is one of the milestones of pandemic preparedness. In September 2022 National Microbiology Reference Laboratory (NMRL) established the monitoring programme for respiratory viruses aimed to cover regional and central hospitals.

Materials and Methods. 392 nasopharyngeal swabs from patients with acute respiratory tract illness symptoms were submitted at the NMRL by Liepāja Regional Hospital, Jelgava Hospital, Vidzeme Hospital, and Riga East University Hospital from September 8 to December 9. 233 swabs were subjected to multiplexed real-time PCR by Anyplex II (*Seegene*) and tested for the presence of SARS-CoV-2 RNA by Allplex-SARS-CoV-2 Assay (*Seegene*), Cobas-6800 (*Roche*), Alinity- mSARS-CoV-2 Assay (*Abbott*), or Xpert Xpress-SARS-CoV-2/Flu/RSV (*Cepheid*). 159 swabs were tested by QIAstat- Dx Respiratory-SARS-CoV-2 panel (*Qiagen*). The patients represent six age groups: 0–4, 5–15, 15–29, 30–44, 45–64 and ≥ 65 ($n = 117, 35, 36, 52, 47, 105$, respectively).

Results. We detected viruses of six genera definable as mono-infections ($n = 165$; 72%) and co-infections ($n = 63$; 28%) presented by 37 combinations of 13 viruses, ranging from two ($n = 50$; 27%) to five viruses ($n = 1$) per patient. 228 swabs (58%) were positive for one or more respiratory viruses. Dominating infected age group was young children (age 0–4; $n = 105$; 46%). Co-infections exceeded a quarter of the positive swabs, occurring mostly among young children (age 0–4, $n = 48$; 76%). The most frequently detected were respiratory syncytial virus (RSV) and rhinovirus (RV) ($n = 88$ and $n = 83$; 75% in total, including undifferentiated RV/enterovirus by *Qiagen* ($n = 19$)). The third of RSV-positive patients ($n = 31$; 35%) were co-infected. The most recurrent partners of RSV were the RV ($n = 17$; 55%) and adenovirus ($n = 9$; 29%).

Conclusions. The monitoring programme enabled us to unveil the diverse respiratory virus landscape three months before the influenza epidemic in Latvia. The sustainability of the programme is a collaborative effort of many stakeholders, and the involvement of more hospitals is desired.

SUBJECTIVE HEALTH STATUS, HEALTH BEHAVIOURS AND HIGH-RISK BEHAVIOURS AS RISK FACTORS FOR ADOLESCENT PSYCHOPATHOLOGY

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Objectives. To examine the role of subjective health status, health behaviours and high-risk behaviours as risk factors of mental health difficulties in a representative sample of 11-, 13- and 15-year-old adolescents in Latvia.

Materials and Methods. The study was conducted using data from the international Health Behaviour in School-aged Children (HBSC) study year 2017/2018 Latvian database. Statistical modelling was performed to explore the link between mental health risks (as measured by the Strengths and Difficulties Questionnaire (SDQ)), socio-demographic risk factors (gender, age, socioeconomic status), health complaints (subjective health, body image, psychosomatic symptoms), health behaviours (sleep and physical activity) and high-risk behaviours (smoking, drinking, problematic social-media use).

Results. The sample consisted of 4412 11-, 13- and 15-year-old students. Overall, 155 (8.0%) boys and 209 (10.3%) girls were identified by the SDQ screening as having “abnormal” levels of psychopathology. Adolescents from families with low affluence had 1.4x higher odds of screening positive for mental health difficulties. In a binomial regression model, the gender and socioeconomic status-adjusted odds ratios of scoring positive for significant mental health difficulties on the SDQ were 3.7x (CI 2.98–4.68) higher for adolescents having poor subjective health, 2.0x (CI 1.62–2.52) higher for having inadequate body image, 2.6x (CI 2.06–3.29) higher for having multiple health complaints, 2.1x (CI 1.66–2.68) higher for getting less than 7 hours of sleep on weekdays, 1.6x (CI 1.23–1.97) higher for having low level of physical activity, 1.6x (CI 1.19–2.22) higher for smoking cigarettes, 1.50x (CI 1.07–2.12) higher for using e-cigarettes, 1.9x (CI 1.54–2.46) higher for drinking alcohol, and 3.7x (CI 2.78–4.97) higher for having a problematic level of social-media use.

Conclusions. Adolescent girls in Latvia are at a higher risk of having mental health difficulties. Subjective health status, poor health behaviours and high-risk behaviours are significant risk factors for adolescent psychopathology and should be considered important targets for public health interventions.

TESTING REGIMEN OF TOTAL CHOLESTEROL, GLYCATED HEMOGLOBIN AND THYROID-STIMULATING HORMONE IN LATVIAN POPULATION: SINGLE LABORATORY DATA

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Objectives. Cholesterol, glycated hemoglobin (HbA1c) and thyroid-stimulating hormone (TSH) are extensively used for disease prophylaxis, diagnostics and monitoring, their testing regimen may serve as indicators for quality and accessibility of medical services.

The aim of the research was to analyze large series of these tests, assessing testing coverage and age and gender-related issues.

Materials and Methods. Continuous cohorts of anonymized total cholesterol, HbA1c and TSH tests performed at SIA “Centrālā laboratorija” in 2021 were analyzed. Latvian demographic structure (stat.gov.lv, IRD040) was split into 10-year age groups; testing coverage (tests per group population) and prevalence of abnormal tests (percentage from tests in the group) were calculated.

Results. Cholesterol. 290231 tests, M:F 0.62. 60.2% results were abnormal (88.5% elevated); 54.9% in males, 63.5% in females. In males, the most covered age groups were 60–90 years, the peak of abnormal results was at 40–50 (69% tests). In females, maximal testing was at 60–80, the abnormal peak at 50–60 (77.5%).

HbA1c. 88596 tests, M:F 0.60. 60% results were abnormal (99.4% elevated); 62.1% in males, 58.7% in females. Testing intensity was the highest at 70–80; abnormal results peaked at 60–70 (71.2%) and remained high. In females, testing peak was at 70–80 and plateau of abnormal results at 50–90 (68%).

TSH. 291735 tests, M:F 0.40. 18.2% abnormal results (50.3% decreased); 24.6% in males, 15.6% in females. Peak testing intensity in men at 70–80 coincided with abnormal result peak (46.7%). In women, testing peak was at 50–70 and abnormality peak at 70–80 (31%).

Conclusions. There is a substantial potential for improving the efficacy of the studied regimen. Age group 40–50 and males in general are the least covered.

HbA1c is comparatively undertested.

The study is limited by single institution cohorts, though large; comparison with other data sets and inclusion of other parameters would be useful.

PREDICTION OF DISEASE INCIDENCE BASED ON BASELINE PERIODONTITIS

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Keywords. Hospitalization; Register study; Periodontitis; Chronic infections

Objectives. Chronic infections upregulate cytokines and other inflammatory mediators causing subclinical inflammation with systemic effects that may lead to hospitalization. The paradigm is in the oral infections – systemic health connections. Associations are known between poor oral health and many diseases. The present study, using hospital database in Sweden, hypothesized that patients having periodontitis in 1985 suffered, during the following decades, from diseases that called for hospitalization.

Materials and Methods. This long-term cohort study investigated the associations between periodontitis and medical problems later in life (Söder et al. Community Dent Oral Epidemiol 1994;22;106). The subjects were selected from registry file of inhabitants ($n > 100\,000$) of Stockholm area including 3273 adults aged 30 to 40 years, born on 20th of any month in 1945–1954. 1676 subjects (838 men, 838 women) participated and underwent initial clinical examination. The final sample was 1655 patients (824 men, 831 women). Thereafter, hospital register of the National Board of Health, Sweden, was used in the follow-up in view of the baseline oral health data. Common statistical methods like step-wise logistic regression were employed. A single-sided hypothesis was used, leading to one-tailed tests. The study was approved by the Ethical Committee of Karolinska Institute.

Results. Based on ICD-10 categories and baseline oral health (periodontitis/no periodontitis), the following statistically significant differences in hospitalizations were found: neoplasias ($n = 55$, 20.9%, $p = 0.04$, OR = 1.42, CI 1.015–1.996), endocrine, nutritional and metabolic diseases ($n = 16$, 26.2%, $p = 0.03$, OR = 1.72 CI 0.949–3.128), mental and behavioural disorders ($n = 26$, 27.4%, $p = 0.003$, OR = 1.66, CI 1.027–2.689), circulatory diseases ($n = 66$, 24.5%, $p < 0.001$, OR = 1.64, CI 1.188–2.249), respiratory diseases ($n = 25$, 27.8%, $p = 0.003$, OR = 1.76 CI 1.078–2.864), diseases of genitourinary system ($n = 32$, 22.4%, $p = 0.04$, OR = 1.57, CI 1.030–2.402), and symptoms not elsewhere classified ($n = 53$, 22.1%, $p = 0.01$, OR = 1.44, CI 1.022–2.022). All other ICD categories did not show statistical significant differences.

Conclusions. The study hypothesis was confirmed showing that baseline chronic infection indeed may reflect in the need for hospital treatment due to systemic diseases later in life.

COMPUTER USE HABITS OF RSU STUDENTS IN HOME ENVIRONMENT DURING REMOTE STUDIES

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Keywords. Remote studying; Computer; Ergonomic setup; Ergonomics; RULA

Objectives. COVID-19 pandemic forced students all over the world to adapt to a new and not so familiar way of acquiring education – in home environment with the help of internet and technologies. Due to unexpected start of pandemic, most of the students did not have enough time and resources to adapt ergonomic remote workplace at home. This potentially can negatively affect students' physical health.

Aim of the study is to find out if student's typical remote workplace with computer is ergonomically appropriate.

Materials and Methods. out of 105 RSU medical students, who participated in the interactive anonymous survey about computer use habits during the period of remote studies, were selected to objectively analyze their remote workplace according to ergonomics requirements. Participants voluntarily uploaded an image of themselves in their typical remote work environment from side view. Images were analyzed by rapid upper limb assessment method (RULA).

Results. Most workplaces were evaluated with final score of 3–4 points, that means “further investigation, change may be needed”. 37.5% of workplaces had 3 points, but 56.3% – 4 points. Only 6.3% of participants had work environment with score 5 (“further investigation, change soon”), but none reached ≥ 6 (“investigate and implement change”) or 1–2 points (“ergonomically appropriate and change is not necessary”). The most affected body part was neck – 87.5% had 2–3 points out of critical 4 in the neck analysis section. Only 12.5% of workplaces acquired 1 point in the neck analysis section.

Conclusions. Analyzed students' remote work environments mainly were not ergonomically optimal for studies, but these problems were not critical. The biggest problem was inappropriate height of the computer screen to the level of eyes, that can cause neck overload. Improvement of ergonomics by raising the level of screen is recommended to prevent potential health problems.

FEMALE MASTURBATION PRACTICES AMONG DIFFERENT POPULATIONS AND AGE GROUPS

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Keywords. Sexual health; Female masturbation; Female; Masturbation

Objectives. Assess efficacy of sexual education in schools, whether female masturbation was included and whether it is sufficient in preparing adolescents for safe, consensual sex. Assess effects of religious, cultural, and parental factors on women's views towards masturbation. Assess the frequency of the female orgasm when masturbating solo versus with a partner. Assess the nature of women's emotions experienced when masturbating.

Materials and Methods. Cross-sectional anonymous online questionnaire with 24 questions both multiple choice and open ended. Inclusion criteria was female/identify as female, 18 years and older. Approval of the study by Riga Stradins Research Ethics Committee. Analyzation of data was conducted via the SPSS 27 system.

Results. A sample size of 1068 participants, aged ≥ 18 years, mainly European (46%) and North American (43%), was obtained. 64.6% reported insufficient sexual education. 84.4–85.2% stated that female masturbation was not covered, with 59% of participants indicating the need for it. Amongst 39.2% of participants, parents didn't discuss any sexual education with them with 29.8% of participants forbidden to engage in pre-marital sexual activity. Amongst those prohibited 38% still masturbated. A total of 1.3% of participants underwent genital mutilation. Assessing frequency of masturbation majority (40.3%) reported to masturbate more than once weekly with the most popular mode of masturbation being sex toys (44%) followed by hands (42%). Comparing the frequency of orgasm while masturbating versus during sexual intercourse with a partner, 59% always report having an orgasm while masturbating solo; compared to 15% when with a partner. Emotions experienced by women during masturbation were mostly positive with the majority feeling relieved (68.7%).

Conclusions. Sexual education programs in schools need reassessment as they are insufficient in teaching about female masturbation and preparing students for safe and consensual sexual intercourse. Female masturbation should be considered a right to female sexual health, this needs to be ensured and included as a normal topic of discussion, no longer considered a taboo in society.

THE AVAILABILITY OF DOSAGE FORMS IN LATVIA APPROPRIATE FOR PEOPLE WITH DYSPHAGIA

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Keywords. Dysphagia; Difficulties swallowing; Availability of drug forms

Objectives. Swallowing difficulties impair quality of life, also drug use. Solid dosage forms are more popular in drug market than others, but not all people can easily swallow them. Three most consumed anatomical groups of drugs in Latvia in 2021 were digestive tract and metabolism, cardiovascular system, and nervous system. The purpose of this study is to find out if people with swallowing difficulties in Latvia have available appropriate dosage forms in main ATC drug groups which are consumed the most.

Materials and Methods. Analysis of “Statistics on Medicines Consumption in Latvia in 2021” and determining three most consumed anatomical groups of drugs, also looking for active ingredients in these groups. Use of “Medicinal product register of Latvia” to find out what kind of dosage forms are available for those active substances and are they appropriate for people with swallowing difficulties to intake.

Results. The best situation of availability of appropriate dosage forms in Latvia for people with swallowing impairment is in nervous system group, because there are haloperidol solution for internal use, olanzapine and mirtazapine, also betahistine oral dispersible tablets that can be indicated by doctor if needed. Omeprazole capsules can be opened and mixed with water, juice or mashed apples to ease swallowing. We have only one kind of oral dispersible tablets for hypertension. There are no other forms for statins in Latvia except solid dosage forms (tablets and capsules).

Conclusions. Study showed that there is a lack of appropriate dosage forms for people with dysphagia in Latvia. People should be more instructed by healthcare professionals (doctor, pharmacist) about cautions in drug modification.

FOLLOW-UP OF THE RECENT CHANGES OF THE SEXUAL AND REPRODUCTIVE HEALTH LEGAL FRAMEWORK IN LATVIA

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Keywords. Sexual and Reproductive Health; Sexual and Reproductive Health law; Abortion

Objectives. Sexual and reproductive health (SRH) includes a broad spectrum of areas that are covered by legal regulations and are in line with international and national policies as well as the latest scientific evidence. The goal of this study was to evaluate changes in the legal framework related to SRH taking place in Latvia since 2011 when the latest population based SRH survey was carried out.

Materials and Methods. This study is a part of the project “Study on the factors and habits affecting sexual and reproductive health in Latvia” initiated by the Ministry of Health of Latvia in 2022 and implemented by the Rīga Stradiņš University in collaboration with the Kantar/TNS Latvia. A desk review of the SRH national policies implemented in 2011–2018 was conducted by analyzing the approved regulations and amendments.

Results. Since 2002 SRH in Latvia has been regulated by the SRH law. Since 2011 two amendments have been approved by the Parliament covering: 1) family planning and abortion and 2) germ cells. Cabinet Regulations N440 (2019) is one of the steps in the implementation of the amendment related to abortion and is directly linked to the development of training materials for healthcare providers on consultation of women asking for induced termination of pregnancy. According to the SRH law, such consultation is to be provided to all women on request. However, the mechanism of monitoring the implementation of these regulations as well as the evaluation of the impact of this amendment in the SRH Law is missing and makes it impossible to link with the decreasing numbers of induced abortions in Latvia.

Conclusions. Monitoring the implementation of the SRH policy in Latvia requires further improvement and a coordinated, evidence-based approach.

MENSTRUAL HYGIENE PRODUCT ACCESSIBILITY TO ADOLESCENTS IN THE EAST REGION OF LATVIA

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Keywords. Menstrual hygiene products; Menstrual health; Period poverty; Adolescent

Objectives. Lack of menstrual hygiene products (MHP) is a worldwide issue that causes health risks and infringes on human rights. However, no research has been done about the Latvian population. The aim of this study was to determine the level of MHP deficiency and its effects on education and social life in the adolescent population in eastern Latvia.

Materials and Methods. A cross-sectional study using an anonymous online questionnaire was carried out from October to December 2022. This questionnaire was distributed through schools. Informed consent from participants and parents was obtained. The questionnaire included close-ended and open-ended questions. The questions were regarding MHP accessibility, the reasons for deficiency, and the consequences of it. An exclusion criterion was the absence of menstruation.

Results. The study included 102 participants from eight schools, in the age range of 13–19. 42% claimed that their school does not provide any MHP. 15% reported using self-made MHP of whom 16% use them in every or almost every menstruation. 5% claimed that they have had issues acquiring MHP due to financial difficulties. 19% of participants had missed at least one day of school a semester due to lacking MHP. Almost one-third had missed physical exercise classes at least once in the semester due to a lack of MHP. Participants, also, stated that they have missed extracurricular activities and social events. 38% have felt shame due to MHP deficiency. Reasons for shame included the need to ask for MHP, fear of leakage, and teasing from peers. 98% wish that MHP were provided in school restrooms.

Conclusions. The adolescents of Latvia in the east region do experience MHP deficiency. The lack of MHP has a negative effect on education, extracurricular activities, social life, and mental health. There is a need for freely available MHP in schools.

ANALYSIS OF FACTORS THAT MOTIVATE OFFICE WORKERS FOR STANDING UP AFTER PROLONGED SITTING TIME AT WORK

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Keywords. Sitting time; Office workers; Motivation

Objectives. Modern digitalized way of working causes more workers to use computer and spend long hours sitting. Sedentary behavior can negatively affect the health of workers in many ways; therefore prevention is essential.

Analyze the factors that make office workers get up from their workplace and move around.

Materials and Methods. 238 office workers in the age range 18 to 65 years, who spend most of their working hours sitting at the computer, filled out an anonymous questionnaire. Six respondents, who did not meet inclusion criteria as sedentary behavior, were excluded.

Results. Visit to the facilities is the most frequent factor of motivation for standing up after prolonged sitting for all groups of office workers. Feeling hungry and thirsty is more motivating for those workers who sat for 1–4 hours in comparison with others, but less motivating for those who sat for more than 8 hours daily. Feeling pain and stiffness is more motivating for office workers who sat for 5–6 hours but not for those who sat for more than 8 hours daily. Statistically significant association was found between both sitting time groups at work and motivating factors for movements such as feeling pain or stiffness in some body parts ($p < 0.001$), talking to colleagues ($p = 0.042$), willingness to make a call ($p = 0.046$).

Conclusions. Sedentary office workers are mostly motivated to stand up by their physiological needs, such as visit to the facilities or feeling thirst or hunger despite their sitting time at work. Pain or stiffness is an important but less motivating factor for movement. Less motivating is also willingness to make a call or talk to colleagues, but those are statistically significant.

KNOWLEDGE ON INDICATIONS OF EPISIOTOMY AMONG LATVIAN OBSTETRICIANS AND MIDWIVES

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Keywords. Episiotomy; Health knowledge; Practices in health; Obstetrics; Delivery; Perineum

Objectives. The World Health organisation has stated that routine use of episiotomy is not recommended for women undergoing spontaneous vaginal birth and should be used only if indications are present. The research outlines the clinical indications for episiotomy and reviews the role of the multi professional team in ensuring proper use, understanding current recommendations, and caring for patients who undergo episiotomy.

Materials and Methods. A questionnaire was developed to assess the knowledge and understanding of health professionals about episiotomies, indications, procedure etc. as part of a larger project. A total of 74 subjects were included in the study – 33 midwives, 37 obstetricians and 4 trainees in the specialty.

Results. Foetal distress as an indication for episiotomy was chosen by 25/74 (33.8%). 49/74 (66.2%) of respondents believe that episiotomy protects against third or fourth-degree lacerations. Operative vaginal delivery with forceps as an indication stated 38/74 (51.4%) of respondents. At the same time for some indications up to 51/74 (68.9%) mentioned that the application of episiotomy depends on the situation.

In the question on how they decide on the need of episiotomy 10/74 (14%) respondents stated that they perform episiotomy with strict indications, however 37/74 (50%) answered that they consider the risks and benefits. 29/74 (39%) of respondents stated that they do not perform episiotomy routinely, but the same number of respondents chose the answer “Trust my experience and intuition, manipulation seems to be a normal part of obstetrics”. Spearman’s correlation was identified ($r = 0.432$, $p < 0.001$) comparing this statement within the respondents’ age groups.

Conclusions. The results indicate a lack of common understanding of the place of episiotomy in modern obstetrics. The results of the research should be discussed in an audience of professionals, and this issue should also be included in training programs.

TRENDS OF SITTING BEHAVIOUR AT WORK

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Keywords. Sedentary behaviour; Office workers

Objectives. The aim of the study was to analyse trends of sitting behaviour for office workers.

Materials and Methods. Anonymous questionnaire was created and distributed electronically across office workers during May 2022. Answers of 232 respondents were analysed statistically, 6 out of 238 were excluded.

Results. 41% (n = 95) of participants were sitting for 6 hours or less during their working hours, 38% (n = 88) – 7–8 hours, 21% (n = 47) – more than 8 hours. 71% (n = 112) of women and 50% (n = 23) of men were sitting for 7 hours and more. 27% (n = 18) of 18–30-year-olds, 15% (n = 14) of 31–44-year-olds and 20% (n = 15) of 45–64-year-olds were sitting for more than 8 hours at work. 53% (n = 52) of participants working in the office were sitting for 6 hours or less but 43% (n = 22) of remote workers were sitting for 7–8 hours ($p < 0.05$). Consequently, 64% (n = 63) of office workers and 37% (n = 19) of remote workers were using stairs at work ($p < 0.05$). There was no statistically significant difference between using stairs at work and health status but there was difference between age and use of stairs at work – 48% (n = 32) of 18–30-year-olds, 52% (n = 48) of 31–44-year-olds, 60% (n = 44) of 45–64-year-olds were using stairs at work ($p < 0.05$). 64% (n = 30) of participants who were sitting for more than 8 hours, reported average health status; 60% (n = 57) of participants who were sitting for 6 hours or less, reported their health status as good ($p < 0.05$). There was statistically significant difference between age and health status: 55% (n = 36) of 18–30-year-olds, 57% (n = 52) of 31–44-year-olds, 33% (n = 24) of 45–64-year-olds reported their health status as good and 39% (n = 26; n = 36) of 18–30 and 31–44-year-olds and 55% (n = 51) of 45–64-year-olds reported their health status as average ($p < 0.05$).

Conclusions. More sitting at work was linked to remote work, people aged 18–30, women, and average health status.

CHANGES IN CONCENTRATION OF CARBON DIOXIDE AND TEMPERATURE IN UNIVERSITY CLASSROOMS

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Keywords. Carbon dioxide; Indoor air quality; Natural ventilation; Occupancy

Objectives. The purpose of the study was to examine changes of temperature, relative humidity, and concentration of carbon dioxide (CO₂) in the university classroom without forced ventilation during the day.

Materials and Methods. For all the measurements, Aranet4 sensor was placed in the middle of class. Student activity and window opening times were recorded. Measurements were taken three days – the first day in room size 72.3 m³ and two days in a larger room of 119.7 m³.

Results. During all three days relative humidity was always at an optimal level, between 40% and 60%. The indoor temperature ranged between 20°C and 26°C; therefore, the allowed indoor temperature (25°C) was exceeded in the smaller room after 45 or 55 minutes. The highest concentration of CO₂ was 2689 ppm on the first day when the measurements were taken in smaller room. The highest concentration on the second day was 1970 ppm and on the third day – 2131 ppm. 20 minutes of ventilation decreased the average CO₂ to 499 ppm which still is not a typical outdoor level of CO₂. According to guidelines, CO₂ concentration should not exceed 1000 ppm. However, on the first day the concentration of CO₂ exceeded this amount after 10 to 20 minutes after the window had been closed. On the other two days, the correlation between the number of students and the time CO₂ exceeded 1000 ppm was observed, which ranged from 20 to 50 minutes.

Conclusions. Natural ventilation is not sufficient for ensuring compliance of low CO₂ level during practical classes, but it is effective during breaks. For natural ventilation to be effective, there should be several ventilation breaks during class. However, the disadvantage of natural ventilation is that other pollutants, such as PM2.5, PM10, VOC can enter the room.

THE EFFECT OF VOLUNTARY ALCOHOL CONSUMPTION ON GUT MICROBIOME DIVERSITY IN LATVIAN POPULATION

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Keywords. Alpha-diversity; Gut microbiome; Alcohol; Shotgun sequencing

Objectives. First results of Latvian Microbiome Project (11/2020–12/2022). Aim was to evaluate differences in gut microbial (faecal) alpha-diversity between voluntary alcohol drinkers (wine, beer, spirits) and non-drinkers.

Materials and Methods. 790 participants, at least 18 years old, were included. Alcohol consumption fact was evaluated using 3-day food records. Bacterial DNA libraries were prepared using shotgun sequencing method. Read taxonomic classification is done using Kraken2 against MGnify v2.0.1 database. Microbiome alpha-diversity was calculated using shannon index at species level using KrakenTools. Statistical significance between groups was evaluated using one-way analysis of variance

Results. Differences between genders: Women ($n = 594$; 4.65 ± 0.02) vs men ($n = 196$; 4.63 ± 0.02) $\text{Pr}(> F) = 0.53$ Alcohol: No – ($n = 512$; 4.62 ± 0.02) vs yes ($n = 278$; 4.68 ± 0.02) $\text{Pr}(> F) = 0.034^*$ ($P\text{-value} < 0.05$) Wine: No – ($n = 625$; 4.63 ± 0.01) vs yes – ($n = 165$; 4.71 ± 0.03) $\text{Pr}(> F) = 0.0102^*$ ($P\text{-value} < 0.05$) Beer: No – ($n = 733$; 4.64 ± 0.01) vs yes – ($n = 57$; 4.67 ± 0.04) $\text{Pr}(> F) = 0.53$ Spirits: No – ($n = 720$; 4.64 ± 0.01) vs Yes – ($n = 70$; 4.68 ± 0.04) $\text{Pr}(> F) = 0.347$

Conclusions. No differences in alpha diversities between genders are observed. Alcohol drinkers have more diverse microbiome comparing with non-drinkers ($P\text{-value} < 0.05$). Wine drinkers have more diverse microbiome comparing with non-drinkers ($P\text{-value} < 0.05$). No differences between beer drinkers and non-drinkers. No differences between spirit drinkers and non-drinkers. Overall, participants that have mentioned alcohol consumption at least once during the intervention (3 days before sample collection) in their food records have more diverse individual gut microbiome composition. Division of alcohol drinkers into smaller groups shows, that this effect more likely is associated with wine inclusion in their diet.

CHALLENGES IN MONITORING INFERTILITY AND MEDICAL ASSISTED REPRODUCTION IN LATVIA

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Keywords. Infertility; Medical assisted reproduction

Objectives. Early diagnostics and management of infertility is one of the goals in the international global and European (WHO/Europe, 2016) sexual and reproductive health (SRH) policy documents. According to the latest data infertility globally affects up to 15% of couples. The disease itself as well as the consequences of its management results in instability of couples and mental health problems. The goal of this work was to analyse the progress in infertility management in Latvia since 2011.

Materials and methods. Infertility is one of the SRH problems included in the “Study on factors and habits affecting the SRH of the population in Latvia” (Id. No. VM 2019/18/ESF) of the Ministry of Health of the Republic of Latvia implemented by the Institute of Public Health of the Rīga Stradiņš University (Pr. N. 01-33.2.2/134). Ministry of Health of Latvia has chosen methodology of the study that includes analysis of existing regulations and data from official statistics from 2011.

Results. Public Health Strategy (2011–2017) envisaged development of uniform register of infertile couples. Since September 1, 2012 infertility diagnostics and treatment is funded from the state budget and since 2018, a centralized waiting line for state-funded infertility treatment, maintained by the National Health Service (NHS) has been established. However, statistics on the full extent of infertility are still not available in Latvia. According to the regulation no.716 of the Cabinet of Ministers the register of infertile families is created in each medical institution where medical assisted reproduction takes place. Since 2022, the state-funded infertility treatment procedure is available for women up to the age of 40. NHS data on state funded infertility diagnosis and treatment are not easily accessible and do not include non-state-funded cases.

Conclusions. For further monitoring of SRH revision of infertility related data management is required in Latvia.

PROMOTING SEXUAL AND REPRODUCTIVE HEALTH (SRH) AMONG ADOLESCENTS THROUGH PEER TO PEER EDUCATION

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Keywords. SRH; Peer to peer education; Adolescence

Objectives. Promoting the specific values and rules concerning SRH in order for the teenagers to develop responsible and analytical thinking, and increasing the spread of correct information among adolescents regarding SRH.

Materials and Methods. The group of participants was made up of 53 teenagers, aged between 14–21 years, from 16 regions of the Republic of Moldova, of which 9 were Ukrainians (%) and 44 were Moldovans (%). The information sessions were organized by Y-PEER Moldova, in collaboration with the University.

Results. Various SRH topics were discussed, and the teens acquired and enjoyed the information about the anatomy and physiology of the reproductive system, STDs and HIV/AIDS, contraception methods, etc. At the beginning of the training, only 24% of teenagers knew what “peer to peer education” meant. In the end, their number increased to 71%. The number of young people who could list most of the physical, mental, and hormonal changes increased 3.3 times. If at the beginning of the training, only 29% of teens offered an incomplete answer about SRH, at the end of the training 61% had objective knowledge. After completing the training, 27% had a solid comprehension of STDs and 37% knew how to prevent them vs. 5%, and 22% before the training. Apprehension concerning truthful information about HIV/AIDS increased from 20% to 46%. Correct understanding of the term “the right age to start sex life” also increased 8 times (5% vs 63%). Teenagers became familiar with various methods of contraception (32% at the beginning of the training and 85% after the training), and 64% of young people correctly assessed the signs of pregnancy.

Conclusions. SRH is still a controversial topic in our society, but developing correct thinking from an early age on this subject will remove the effects of a misinformed society and contribute to its prosperity.

SOCIAL WORKERS ROLE IN THE PROVISION OF SERVICES FOR FAMILIES WITH CHILDREN AND YOUTH WITH DISABILITY IN LATVIA, SLOVAKIA AND PORTUGAL

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Keywords. Families; Children and youth with disabilities

Objectives. There are many services available for families with children and youth with disabilities in Latvia, Slovakia, and Portugal. The interviews were aimed at finding out the interdisciplinary collaboration in the provision of services for families with children and youth with disabilities. The objective of the study was to find out services for families with children and youth with disabilities in Latvia, Slovakia, and Portugal and to find out about interdisciplinary collaboration in the provision of services for families with children and youth with disabilities.

Materials and Methods. All European countries are well structured with social services with the development of the social professions. Different names have been used for the social work profession across Europe, such as “social pedagogue” in Spain and “animators” in France with the mutual aim of helping the clients and user groups. Childcare services have been emphasized in Europe, with the engagement of different professions to work for the benefit of child welfare. “Preventative services” are also available in the form of emotional, financial, and social support, but lacking due to a shortage of finances when policies are under pressure as well as a lack of training in professionals. 13 Semi-structured interviews have been conducted with services providers which include social workers, special educators, counselors, physiotherapists, etc. all interviews have been done face-to-face with the consent to record for transcription purposes.

Results. Social workers perform numerous functions and play an important role in the provision of services to families with children and youth with disability. As core values in the social work profession, their roles include accessing information about services, advocating for families’ rights, counseling, and motivating families. Due to financial constraints, both Latvia and Slovakia lack services such as rehabilitation, various therapies, kindergartens, and few options for inclusive education, whereas in Portugal the rehabilitation services are well structured. From a parent’s perspective, they faced many societal challenges in the accessibility of services. Such challenges included: a lack of access to services and information, a lack of external financial support besides municipal support, and low societal acceptance of disability.

Conclusions. Services have improved for families with children and youth with disabilities. Positive interdisciplinary collaboration in terms of service delivery for families with children and youth with disabilities.

TRENDS IN THE EPIDEMIOLOGY OF SEXUALLY TRANSMITTED INFECTIONS IN LATVIA, 2011–2021

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Keywords. Sexually transmitted infection; Surveillance

Objectives. The WHO Global health sector strategies on, respectively, HIV, viral hepatitis and sexually transmitted infections for the period 2022–2030 (2022) positions the health sector response to STI epidemics as critical to the achievement of universal health coverage – one of the key health targets of the Sustainable Development Goals. The goal of this study was to evaluate the progress in sexually transmitted infections, including HIV, management in Latvia since 2011 by analyzing the available statistics.

Materials and Methods. In this review, surveillance data was analyzed on absolute numbers of reported cases for five STIs (chlamydia, gonorrhea, syphilis, HSV and HIV infections) between 2011 and 2021, by sex, age and route of transmission using data from the Centre for Disease Prevention and Control of Latvia. Incidence rates were calculated, and a descriptive analysis was performed.

Results. Between 2011 and 2021 from reported STIs 78% were chlamydia, 15% gonorrhea, 6% syphilis, and 1% HSV infection. During this time period the incidence rate of STIs decreased by 38% from 111.9 to 69.4 cases per 100 000 population. In men gonorrhea decreased 6.4-fold, syphilis – 2.2-fold, chlamydia – 1.4-fold, while in women gonorrhea decreased 5.1-fold, syphilis – 4.2-fold and chlamydia – 1.3-fold. New STI cases were reported 1.5 times more in women than in men. Since 2017 the dynamics of new HIV infections as well as the number of AIDS cases has been on a steady downward trend. Data fragmentation, finding incomplete but complementary data from different information sources, and limited access to data were identified as main gaps in STI surveillance in Latvia.

Conclusions. Despite the overall decline in the incidence rate of reported STIs in Latvia, it continues to remain an important public health concern. There is a strong need to improve availability and quality of STI surveillance data in Latvia.

USING ELEMENTS OF MUSIC IN SPEECH AND LANGUAGE THERAPY SESSIONS: A SURVEY OF SPEECH-LANGUAGE PATHOLOGISTS AND SPEECH THERAPISTS

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Keywords. Musical elements; Speech; Language; Communication; Therapy

Objectives. To find out whether, how often and in what cases of speech and language disorders speech-language pathologists (SLP) and speech therapists in Latvia use elements of music in speech and language therapy sessions; to find out whether the frequency of use of music elements in speech and language therapy is influenced by the age of the specialist, the experience of the specialist, the work environment, the age of the patients and the type of disorders.

Materials and Methods. A questionnaire from Torry Farnell's study "The Inclusion of Music Therapy in Speech-Language Interventions" was used to survey respondents. Electronic surveys using Google Forms software were conducted from February 16, 2022 to April 6, 2022.

Results. 72 currently practicing SLP/speech therapists participated in the study. 55 respondents (76.4%) use elements of music in speech and language therapy. 26 specialists (36.1%) integrate the elements of music into therapy, 20 respondents (27.8%) – often, but 9 (12.5%) – rarely. There is a weak, positive, statistically significant correlation between the age of specialists and the frequency of use of music elements ($p = 0.004$), ($r_s = 0.335$), but there is no statistically significant correlation between the duration of specialists' experience and the frequency of use of music elements ($p = 0.053$).

Conclusions. 76.4% of SLP/speech therapists in Latvia use elements of music in speech and language therapy. The elements of music are used by specialists in the case of speech, language and voice disorders to improve speech rhythm and tempo, to develop rhythmic sensations, phonological processes, listening skills, to enhance sound pronunciation, breathing and voice quality, to better communication and speech, to develop fine motor and imitation/repetition skills, to create a favorable psycho-emotional environment. The elements of music in speech and language therapy sessions are used by specialists equally often in both pedagogical and clinical work environments.

THE EFFECT OF THE ERGONOMIC MOUSE PAD WITH PALM SUPPORT ON THE TEMPERATURE OF THE 5TH DIGIT OF THE HAND DURING PROLONGED WORK WITH A COMPUTER MOUSE

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Keywords. Ergonomics; Computer mouse pad; Skin temperature; Thermography; Standing desk chair

Objectives. Along with the increase of computer usage, the need for ergonomic adaptations becomes actualized. The aim of this study was to determine how an ergonomic mouse pad with palm support and armrest affects the temperature changes of the wrist skin in volunteers who have been working on a computer for prolonged time compared to use of only armrest and no mouse pad.

Materials and Methods. Three volunteers participated in this study. Participants were asked to work on a computer for 3 hours using a standing chair. The test was repeated two times on different days changing the standing desk setup: with armrest and padded mouse pad and only with armrest. Skin surface temperature of the right wrist fifth finger was measured every 15 minutes by high resolution medical digital infrared camera (ICI-ETI-7320-Pro) in controlled environmental conditions. Data statistical analysis was done by IBM SPSS Statistics program.

Results. After 3 hours of the trial temperature of the 5th digit lowered more gradually when a padded mouse pad was used. A strong negative correlation with time: with armrest and padded mouse pad (Spearman's correlation coefficient $r_s = -0.973$, $p < 0.001$) and only with armrest ($r_s = -0.984$, $p < 0.001$). Mann Whitney U test significance was = 0.169 which leads to the conclusion that there is no statistical difference in using or not using padded mouse pad.

Conclusions. Use of an ergonomic mouse pad with palm support has shown no effect on the temperature of the 5th digit of the hand during prolonged work with a computer. A slightly faster drop in temperature without a mouse pad could be due to a pressure on the carpal tunnel.

WHAT IS THE LEADING ASPECT OF BURNOUT SYNDROME IN LATVIAN EMERGENCY MEDICINE WORKERS?

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Keywords. Burnout syndrome; Emergency medicine services; Burnout Assessment Tool

Objectives. Burnout syndrome is a condition resulting from a chronic exposure to stress in the workplace. Emergency medicine workers (EMW) usually work 24-hour shifts while the job that is being done is emotionally taxing and overall exhausting. Working in such conditions can be a predisposing factor for the development of burnout syndrome in the long-term. The aim of this study was to evaluate which aspect of burnout syndrome was the main contributing factor for its development in employees of Latvian emergency medicine services.

Materials and Methods. The data were collected via anonymous Internet-based survey including 70 emergency medicine workers and roughly the same size of a control group (CG). The level of respondents' burnout was measured by using a translated version of Burnout Assessment Tool (BAT) in Latvian. Four aspects of burnout syndrome assessed by 5-point system according to BAT were analyzed comparing to the CG.

Results. Overall, the burnout measured for EMW was 2.49 vs. CG it was 2.59. The 4 aspects analyzed were exhaustion, mental distance, cognitive impairment, and emotional impairment. The highest score for EMW was exhaustion – 3.07 vs. 2.96 in the CG, while the second most common was mental distance at 2.36 vs. 2.29 in CG. Last two aspects were more common amongst the CG – cognitive impairment was 2.46 for CG, while only 2.13 for EMW. As for emotional impairment – 2.22 for CG and 2.07 for EMW.

Conclusions. The data suggests that the burnout syndrome is almost equally prevalent in EMW and general society, but amongst all aspects of the burnout syndrome, physical exhaustion is the main contributing factor for emergency medicine workers.

DEPRESSION AND CHANGES IN QUALITY OF LIFE DURING THE WAR AMONG UKRAINIAN STUDENTS

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Keywords. War; Students; Depression; Quality of life; Ukraine

Objectives. Since the beginning of war in Ukraine, millions of people fled the country, exposed to the horrors of war that ruined their lives. But, mental health and changes in quality of life (QL) among young Ukrainians were not studied yet. The aim of this study was to analyze level of depression and changes in QL among Ukrainian students during a war.

Materials and Methods. A survey-based cross-sectional study was performed among 95 Ukrainian students, who studied at the universities in a period September-October, 2022. Depression was assessed using Patient Health Questionnaire (PHQ-9), QL – Short Form Health Survey (SF-36). Data was analyzed with Student's t-test.

Results. 93% of respondents continue their education at the Ukrainian universities at 2022/2023 academic year, while the rest were unable to return to the education. Currently, the main hosting countries for students are the EU countries. 19% of respondents were forced to leave their home and become an internally displaced person since the beginning of the war. SF-36 survey detected that physical health score decreased in 95.3% of males and 91.2% of females due to the bodily pain scale; mental health score decreased in 61.4% of males and 48.9% of females via the role-emotional functioning scale. PHQ-9 showed that females suffered from depression more often than males. Moderate depression was detected in 17.1% of females and 7.1% of males ($p < 0.05$); severe – in 12.9% of females and 1.4% of males ($p < 0.05$); extremely severe – in 10% of females and 4.3% of males ($p < 0.05$). Gender positively correlates with depressive state ($\chi^2 = 47.4$; $p = 0.003$).

Conclusions. The war negatively changed lifestyle of Ukrainian student via forced relocation and disability to continue education in universities. Among students were detected severe and extremely severe depression, low level of QL due to changes in mental health during war in Ukraine.

VENTILATION AND DISINFECTION EFFECT ON CARBON DIOXIDE AND TOTAL VOLATILE ORGANIC COMPOUND LEVELS IN TWO DIFFERENT HOUSEHOLDS

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Keywords. Indoor air quality; Ventilation; TVOC; Carbon dioxide

Objectives. Nowadays, since people tend to spend more time indoors, ensuring appropriate indoor air quality is vital. It has been advised to employ chemical disinfectants on surfaces, such as ethanol and others, since the COVID-19 pandemic began. It's possible that using ethanol-containing cleaning supplies in populated areas results in unnoticed air pollution. Total volatile organic compounds (TVOC) is used to represent the entire pool of pollutants. Carbon dioxide (CO₂) levels indicate air quality. The purpose of this study is to determine the impact of disinfecting with ethanol and room ventilation on TVOC and CO₂ levels.

Materials and Methods. In two flats (room size 19 m² and 20 m²), the indoor air quality indicators were measured for two days. We focused on CO₂ (ppm) and TVOC (mg/m³) average levels each hour. LMT monitoring logger was used for humidity (%), temperature (°C) measurement and PCE-RSCM16 particle counter for CO₂, TVOC level detection. The time and duration of ventilation, disinfection with ethanol and other activities (e.g., cooking) were recorded. In both flats we practiced natural ventilation by opening the windows. Other air quality indicators (e.g., particulate matter levels) were also collected for further studies.

Results. In both households TVOC and CO₂ levels increase at the moment of disinfection. Such an increase is also observed during cooking. Ventilation is effective to reduce the CO₂ but is less effective on TVOC levels in a short period of time.

Conclusions. The use of ethanol-containing disinfectants increases TVOC and CO₂ levels in small living spaces. Although ventilation is effective for reducing indoor air pollution, it should be done regularly especially in small rooms. Despite that TVOC level detection is not a specific indicator, it can be used for air pollutant screening. Further studies of this topic are needed to determine other indicators and impact on health.

HEALTH SYSTEMS RESEARCH

ANALYSING AND MODELLING THE STANDARD HAEMODIALYSIS PROCESS IN DIALYSIS CLINICS IN LATVIA

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Objectives. Health Care Systems are facing several challenges. The lack of resources, such as health workers, but also scarce capacities, e.g. hospital beds, access to diagnostics and interventions, are crucial in the process of providing high class Health Care Services, including haemodialysis treatments and services. The purpose of the research is on the one hand to analyse the current process of Haemodialysis in selected Dialysis Clinics in Latvia and on the other hand to develop a Discrete Event Simulation Model of the Standard Haemodialysis Process.

Materials and Methods. Based on empirical data using a time study, process analysis and interviews with Health Care professionals from multiple Dialysis Clinics the Standard Haemodialysis Process in Latvia was analysed and modelled.

Results. The observational study, expert interviews and the simulation provides a comparison of different Dialysis clinics and substantial knowledge on efficient resource and location utilization in selected Dialysis clinics in Latvia. Based on a total number of 121 patients, the total average number in a dialysis clinic is approximately 4 hr 35 minutes. The analysis helps to improve the process and quality of Haemodialysis service provision in Dialysis Clinics in Latvia.

Conclusions. It can be concluded that analysing the haemodialysis process flow by using a mixed-method approach and using DES can substantially support process management in dialysis clinics and help to improve dialysis and improve the hemodialysis processes and services in Latvia.

ANALYSIS OF ASSOCIATION BETWEEN ACUTE MYOCARDIAL INFARCTION TREATMENT COSTS AND OUTCOMES

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Objectives. To analyze trends in association between AMI patient treatment costs and achieved outcomes in Latvian hospitals.

Materials and Methods. Administrative data for 9795 hospitalizations with diagnose acute myocardial infarction (hospital discharge diagnose) in 2019 – 2021, data on 30-day mortality, data on patients individual demographic characteristics (age, sex, co-morbidities (quantified by Charlson index), treatment costs, applied invasive manipulations were used to estimate association between treatment cost and achieved outcome. Binary logistic regression model was constructed to estimate impact of every factor and its' statistical significance.

Results. Total number of hospitalizations with AMI diagnose has decreased over the period of analysis from 3590 in 2019 till 2885 in 2021. The average cost of treatment per patient is increasing from 2571.91 ((95% CI: 2497.75–2646.07) in 2019 till 3167.01 ((95% CI: 23073.78–3260.24) in 2021. Cost of treatment for patients received PCI is substantially higher 4360.93 EUR (95% CI: 4312.28–4409.58), than for patients received thrombolytic therapy 644.68 EUR (95% CI: 619.38–669.98). Patients received PCI have lower age 67.38 (95% CI: 65.64–69.13) than those received therapy 72.68 (95% CI: 72.28–73.08). Average level of comorbidities, assessed by Charlson index is also lower for patients received PCI: 0.94 (95% CI: 0.92–0.98) and 1.20 (95% CI: 1.16–1.24) correspondingly. Within both groups of patients association between patient's outcome (assessed with 30-day mortality) and cost of treatment is not statistically significant after controlling for age and comorbidities ($p > 0.5$).

Conclusions. The study did not reveal associations between patient level cost of treatment and patient outcome (30 day mortality), after controlling for patient's demographic characteristics (age, sex) and level of comorbidities for patients, hospitalized with AMI between in 2019 – 2021 in Latvian hospitals. Additional researches are needed to discover main drivers of treatment costs.

ARTERIAL BLOOD PRESSURE PHARMACOLOGICAL TREATMENT IN LATVIA: FROM PATIENTS' PERSPECTIVE APPLYING THE EQ-5D-5L QUESTIONNAIRE

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Objectives. Cardiovascular diseases are a leading cause of death *globally*. Non-adherence to medical arterial hypertension (AH) treatment remains low (45.9%). The number of comparative studies of patient related outcomes in the treatment of AH is limited. Aim of the study was to evaluate the generic quality of life in patients with AH treated pharmacologically by using EQ-5D-5L questionnaire.

Materials and Methods. Interviewer-administered, face-to-face cross-sectional survey/multicentre study (outpatient hospitals) was performed from 5 December 2022 to 15 December 2022. Respondents rated their level of impairment across dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), global health rating on a visual analogue scale (EQ-VAS). The study group comprised 244 patients with AH treated pharmacologically, stratified by the use of fixed-dose or multiple pill regimen.

Results. Fixed-dose combinations (FDC) received 66.4% (n = 162) patients, from them controlled AH reported 67.9% (n = 110) of patients and in multiple-pill dose regimen (n = 82) controlled AH was observed in 39.0% (n = 32). Patients reported most significant data on anxiety/depression – being extremely anxious in uncontrolled AH and multiple-pill regimen, severely anxious in multiple-pill dose, moderately and slightly anxious in all treatment groups and both – controlled and uncontrolled AH. Slightly reduced self-care, usual activities, mobility, discomfort observed mostly in multiple-pill regimen in both groups. Reporting full health in FDC group with controlled AH – 74.5%, uncontrolled AH – 67.3% while in multiple-pill dose treatment and controlled AH – 56.2%, uncontrolled AH – 34.0%.

Conclusions. Change from multiple-pill dose regimen to FDC improves generic quality of life in patients with AH treated pharmacologically. Although a five-level version of the widely used EuroQol 5 dimensions (EQ-5D-5L) instrument has been developed, population norms are not yet available for Latvia to inform the future valuation of health in economic evaluations. Future studies should be aimed to estimate health-related quality of life normative values for the EQ-5D-5L preference-based measure in Latvia.

ARTERIAL BLOOD PRESSURE PHARMACOLOGICAL TREATMENT IN LATVIA: MEDICATION PRESCRIPTION CHARACTERISTICS

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Objectives. Cardiovascular diseases (CVDs) are a leading cause of death *globally*. Non-adherence to medical arterial hypertension (AH) treatment remains low (45.9%). ESC/ESH guidelines of AH management recommends simplifying the regimen by reducing number of pills. This study aimed to examine the prescribing practice of antihypertensive medications after the regulatory changes in drug prescription from 2020 (mandatory use of INN – international non-proprietary name).

Materials and Methods. Cross-sectional multicentre study (outpatient hospitals) was performed from 5 December 2022 to 9 December 2022, experts' interviews (n = 15) were conducted.

Results. Among specialists, 40.0% were cardiologists (n = 6), 26.7% – internists (n = 4), 33.3% – general practitioners (n = 5) with work experience 15 ± 3.22 years. Experts (n = 11) reported that their drug prescription habits were affected by 2020 pharmaceutical reimbursement regulations (INN use became a mandatory prescribing medicine) pushing them to use INN medicines. The majority (n = 11) are aiming to prescribe fixed-dose combinations (FDC's) and brand-name medications (n = 8). In majority of cases (n = 12) doctors regularly are asked to prescribe brandname medications. Choice of prescription absolutely (n = 15) is affected by safety for patient, mostly by efficacy (n = 12) and own experience (n = 9). When prescribing the FDC's, the reduction of patient annual visits to doctors observed 80% of experts. Mostly, non-compliance to the treatment reported by patients was observed due: complex medication schedule/regimen (55.3%) and high cost of treatment (33.3%). In cases when FDC's were prescribed, 85% of patients achieved the target of blood pressure.

Conclusions. 2020 pharmaceutical reimbursement regulations significantly influenced doctors' prescribing habits by increasing of INN prescriptions. The rate of fixed-dose combinations (FDCs) increased and is most frequently chosen in accordance with ESC/ESH guidelines. The proportion of INN and FDC's prescriptions increased but is still insufficient to improve non-compliance caused by complex medication schedule (55.3%).

ASSESSMENT OF ANTIMICROBIAL STEWARDSHIP AND INFECTION CONTROL INDICATORS IN REGIONAL ACUTE-CARE HOSPITALS IN LATVIA – INTERDISCIPLINARY MIXED METHODS' RESEARCH

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Objectives. Antimicrobial stewardship (AMS) and Infection prevention and control (IPC) are the key elements in limiting the emerging antimicrobial resistance (AMR). AMS is included in Latvia's National One Health action plan, but there is no data on the actual prevalence of AMS program components, epidemiological indicators and barriers for the implementation in regional hospitals (RH) in Latvia.

This study aimed to assess ongoing AMS and IPC activities in acute care RH in Latvia and integrate epidemiological and behavioral science data to identify site-specific barriers and develop context-specific recommendations

Materials and Methods. Mixed-method research was applied in eight RH in Latvia between 2019 and 2021, including evaluation of AMS program components, antimicrobial consumption data, epidemiological data, audits of infection prevention and control, and qualitative study of contextual factors. To encourage continuous AMR and IPC data analysis at the study sites, the train-the-trainer principle was applied.

Results. The study revealed high antibiotic consumption in RH in 2019 (66.6 DDD/100 bed-days) which has further increased in 2020 (73.1 DDD/100 BD). This trend was also reflected in the Point Prevalence Survey data, where we observed that 48.4% (654/1350) of included patients receive antibiotics. 51.8% of prescribed AB were third-generation cephalosporins. We also observed marked heterogeneity in the choice of antibiotics (e.g. 23 different antibiotics were prescribed for community-acquired pneumonia, 15 – for lower urinary tract infection). 81% (92/114) of patients were prescribed a prolonged perioperative antibiotic prophylaxis. Median blood culture sampling practices were low at only 6.2 sets/1000BD. The qualitative interviews have indicated the lack of national antibiotic guidelines, financial support and qualified and dedicated staff to implement the AMS programme.

Conclusions. The study has identified significant gaps in AMS and IPC programs in RH in Latvia, highlighting heterogeneity between study sites and be applied to inform further strengthening of AMS components in RH.

ASSESSMENT OF READINESS OF LATVIAN HEALTHCARE SYSTEM FOR IMPLEMENTATION OF VALUE-BASED HEALTHCARE APPROACH

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Objectives. To evaluate readiness of Latvian Health Care (HC) system for the implementation of VBHC approach.

Materials and Methods. Expert focus group method was applied to evaluate the readiness of the HC system for the requirements of VBHC by applying the set of indicators (The Economist Intelligence Unit, 2015) within four dimensions: (1) *Enabling political context*; (2) *Measuring outcomes and costs*; (3) *Integrated and patient-focused care*; and (4) *Outcome-based payment approach*. The participants of three focus groups representing patients and HC providers assigned a performance level in points (0-1-2-3) to each indicator, where 0 was assigned if the indicator is not implemented at all, and 3 – if the process has been established, the results are listed and monitored.

Results. The overall readiness of the HC system for VBHC implementation was assessed at the level of 0.75 from 3.0, or 25%. The lowest scores 0.67 (22%) were assigned to the dimensions the *Outcome-based payment system* and *Measuring outcomes and costs*. Slightly higher values – 0.83 (28%) were assigned to the *Enabling political context* and *Integrated and patient-centered care*.

Conclusions. The study reveals low readiness of the Latvian HC system for the implementation of VBHC approach and the main obstacles for the implementation of VBHC: absence of the comprehensive health care quality and patient safety system, limited support for evidence-based health system research, absence of standardized patient outcome and treatment cost measurement, fragmentation in patient health data collecting and storage.

ASSOCIATIONS OF RELATED DISORDERS AND CONTEXTUAL FACTORS OF YOUNG PEOPLE WITH CEREBRAL PALSY WITH TRANSITION TO ADULTHOOD

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Objectives. When preparing young people with cerebral palsy for adulthood, related disorders and contextual factors should be considered and the identification of their association with the success of the transition process should be clarified.

Materials and Methods. A cross-sectional design was applied. The inclusion criteria for the participants: age 16–21 years, a diagnosis of cerebral palsy, none or some/uncertain cognitive impairment. Transition readiness in terms of autonomy level in participation and health care was measured with the Rotterdam Transition Profile, 1.0, version of March 2010.

Results. Eighty-one young people took part (male 41, female 40). Participants' age was associated with autonomy in education and employment ($r_s = 0.28$), finance ($r_s = 0.43$), housing ($r_s = 0.29$), leisure (social activities) ($r_s = 0.26$), sexuality ($r_s = 0.24$), services and aids ($r_s = 0.35$) and rehabilitation services ($r_s = 0.69$). Severe vision impairment was associated with autonomy in leisure (social activities) ($r_s = -0.23$), intimate relationships ($r_s = -0.25$) and sexuality ($r_s = -0.23$). Severe speech impairment was associated with autonomy in sexuality ($r_s = -0.22$). Need for an assistant was associated with the autonomy in education and employment ($r_s = -0.44$), housing ($r_s = -0.31$), leisure (social activities) ($r_s = -0.30$), intimate relationships ($r_s = -0.45$), sexuality ($r_s = -0.44$), transportation ($r_s = -0.76$), care demands ($r_s = -0.32$) and services and aids ($r_s = -0.39$). The level of education of the mother was associated with the autonomy in intimate relationships ($r_s = -0.37$), sexuality ($r_s = -0.26$) and transportation ($r_s = -0.24$). The level of education of the father was associated with the autonomy in intimate relationships ($r_s = -0.28$). Number of siblings (> 1) was associated with the autonomy in housing ($r_s = 0.38$). All correlations had $p \leq 0.05$.

Conclusions. The need for an assistant and participants' age had the most association with autonomy domains. Nevertheless, any significant associations should be considered when planning transition process to adulthood for young people with cerebral palsy.

CHALLENGES AND SOLUTIONS FOR ARTIFICIAL INTELLIGENCE ADOPTION IN HEALTHCARE: LITERATURE REVIEW

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Objectives. Even though Artificial Intelligence (AI) solutions are already used and have additional potential to revolutionize healthcare (HC), its application in practice tends to face limitations.

Objectives of this research are to identify and summarize knowledge on the challenges and solutions for the adoption of AI in HC.

Materials and Methods. A literature review of articles (N = 19) published between 2018 and 2022 in Scopus, Science Direct and BMC Health Services Research by using the key terms “challenges”, “solutions”, “artificial intelligence”, “AI”, “adoption”, and “healthcare”.

Results. The study reveals several limitations of AI implementation: the lack of transparency in AI decision making, difficulty to trust and use the results; obtaining high-quality properly labeled medical data; concerns about data privacy, regulation and security; lack of clear regulation and guidelines for the AI use and hesitancy of HC professionals and patients to trust and use AI-powered systems.

Conclusions. To overcome these challenges, studies suggest to apply the solutions: justify the application of AI-powered systems in the context of digital transformation of HC – value-based HC and change management strategies with the aim to benefit patients and improve overall health outcomes; educate stakeholders and involve them in the implementation process to overcome black-box decision making; training on AI to ensure HC professionals can effectively use and understand AI systems; address the challenge of data availability by federated learning and secondary use of health data enabling researchers to discover new knowledge and breakthroughs in medical science. Proper regulation is also essential to ensure the safe and ethical development, testing, and use of AI in HC, with input from HC professionals, patients, and other stakeholders.

CHALLENGES IN MONITORING SEXUAL AND REPRODUCTIVE HEALTH IN LATVIA

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Objectives. UN Sustainable development goals are directly linked with sexual and reproductive health (SRH). In 2023 the world is half way towards achieving the 2030 agenda for sustainable development and many countries, including Latvia, are evaluating progress and existing gaps in improving SRH. The goal of this study is to summarize existing challenges in regular monitoring of SRH in Latvia.

Materials and Methods. This study is a part of the project “Study on the factors and habits affecting sexual and reproductive health in Latvia” initiated by the Ministry of Health of Latvia in 2022 – resuming the study interrupted by COVID-19 in 2020. A desk review to evaluate the impact of the national policies implemented in 2011–2018 on SRH was conducted by analyzing the approved regulations and available national statistics. The evaluation was focusing on the legal framework and data related to maternal and perinatal health, fertility regulation and infertility management, sexually transmitted diseases including HIV, reproductive cancers and gender-based violence.

Results. Since 2002 Sexual and Reproductive Health Law has had four amendments. Despite the fact that the Transitional provisions of the Law clearly define that amendments shall come into force on 1 July 2019, some of them are still not implemented. Information on sexuality education and support to women in overcoming unmet needs to contraception including women living with HIV is scattered and difficult to follow. Despite some progress in developing a joint register of the couples requesting state support for infertility management, each of the six centers providing medically assisted reproduction has its own register and there are no joint data on the scale of infertility in Latvia. Main barrier to analysing the situation of STI/HIV incidence in Latvia is data fragmentation.

Conclusions. There has been some progress in SRH policies since 2011, however, coordinated leadership and monitoring of SRH in Latvia is missing.

CONTEMPORARY TRENDS IN ERGONOMICS ON PATIENT SAFETY IN NURSING AND MITIGATION OF ADVERSE HEALTHCARE-RELATED ERRORS AND ADVERSE EFFECTS

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Objectives. Key words: patient safety, nurses, health, management, ergonomics, person-centered health services. According to the OECD findings (2020), unsafe care results in over 3 million deaths each year, causing high financial, economic and social costs. In developed countries, excluding safety lapses that may not be preventable, the direct cost of treating patients, who have been harmed during their care, approaches 8.7% of health expenditure a year. A human capital approach suggests that eliminating harm could boost global economic growth by over 0.7% a year. Errors cause losses and lower productivity not only in the operation of medical institutions, but also in national economy.

The issue of patient safety is actual in Latvia, therefore the review of the contemporary scientific literature was made to summarise and analyse previous researches and theories in nurses' role in hospitals' efforts to improve patient safety as well as applied tools that help prevent adverse health care-related errors and effects that may develop in patients.

Materials and Methods. A literature search was performed in ScienceDirect and Google Scholar to retrieve studies on nurses' role in patient safety and applied methods that can be used to prevent adverse health care-related errors and adverse effects that may develop in patients. Information was analysed and synthesized, monographic method used.

Results. Results of the study show that patient safety should be patient-centered. Nurses' perception, involvement of patients and their families, teamwork, communication play an important role in assurance of patient safety. Errors in patient safety occur mostly because of the human factors (ergonomics).

Conclusions. Although the concept of patient safety has grown in recent years, there is a need for a more rapid integration of patient safety-related internal control tools into the hospitals' quality management system. Since improvements in the quality management system may be associated with the significant investments, process management should be improved.

CURRENT TRENDS IN RESEARCH ON PUBLIC-PRIVATE PARTNERSHIP FINANCING MODELS IN HEALTHCARE

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Objectives. Public-private partnerships (PPPs) have received increased attention over the last decade as a potential modality for successfully tackling healthcare challenges. Different models have been proposed for organising cooperation, building infrastructure and resolving ownership. However, one of the key issues remains the question of PPPs financing models, which is mainly a matter of public institutions and business structures. At the same time, the question arises as to what extent the scientific community is involved in studying these issues. Therefore, the aim of this research was to analyse trends in scientific publications on PPPs financing models in healthcare.

Materials and Methods. To achieve the aim of this research, a scoping review of scientific articles was carried out to identify research trends and perform mapping on regions and issues covered. Scientific articles were searched for keywords (“public-private partnership” AND “healthcare” AND “financing” AND “model”) in the PubMed database, the Web of Science platform, and the Scopus database.

Results. The databases showed a gradual increase in the number of articles from 2010, peaking in 2019, and then a relatively sharp decline. Publications in the last five years were predominantly focused on the Asian region and PPPs in primary healthcare. European countries were next in terms of publications, with the main focus on PPPs efficiency. Moreover, efficiency has not been rated convincingly high and it has been pointed out that the main factors that may encourage PPPs are: stable economic and legal conditions, appropriate allocation of risk, reputable and competent partners, sufficient initial capital, and diversification of the funding sources.

Conclusions. In recent years, researchers' interest in PPPs financing models has waned. On the other hand, the available research on PPPs efficiency is not conclusive. It is therefore worth taking into account the experience of other countries and carrying out additional scientific research when choosing models.

DEVELOPMENT OF VALUE-BASED HEALTHCARE MODEL FOR BARIATRIC SURGERY IN LATVIA

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Objectives. Value-based health care (VBHC) approach has proved to be superior to conventional fee-for-service reimbursement models in maximizing health gain, minimizing variability of outcomes and rewarding personalized and effective care. Access to bariatric surgery in Latvia is limited due to non-existent reimbursement and all surgeries for local patients being paid out-of-pocket.

The objective of this study is to assess the conditions and priority activities to achieve the implementation of a VBHC reimbursement model in Latvia.

Materials and Methods. Semi-structured expert interviews (N = 8) representing leading specialists in endocrinology, cardiology, nutrition, and bariatric surgery, as well as patient organizations, with the aim to validate the VBHC model created on the evidence presented in scientific literature and other country experience.

Results. The study confirms the necessity to improve access to bariatric surgery, as the most effective and long-lasting treatment option for severe obesity patients.

The conditions for the model implementation include: regulatory changes; NHS tariff calculation method amendments; improved patient outcome data collecting and reporting; funding available for reimbursement. The priority activities include: development of patient selection criteria; creation of multidisciplinary team for preoperative and postoperative care; development of the patient pathway; setting requirements for staff, facilities and equipment; definition of bariatric surgery outcome indicators; design of the reimbursement mechanism to be used throughout the system.

Conclusions. The model framework was approved by the leading specialists in endocrinology, cardiology, nutrition, bariatric surgery and representatives of patient organizations. The study substantiates the conditions and next steps in the implementation of the model and willingness of specialists to cooperate in provision of this completely new VBHC approach in bariatric surgery service.

HEALTH TECHNOLOGY ASSESSMENT FOR FAST-TRACK ELECTIVE KNEE AND HIP ARTHROPLASTY IN A HIGH-VOLUME ORTHOPAEDIC HOSPITAL IN ITALY

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Objectives. Osteoarthritis is a chronic health condition affecting around 240 million individuals worldwide. In Italy, the high volume of hip and knee replacement procedures performed each year, 71,626 and 82,815 respectively in 2020, represent a significant economic burden for the healthcare system. The fast-track perioperative pathway is a package multimodal of interventions, which aims at reducing surgical invasiveness and postoperative recovery time, with lower costs and better patient’s outcomes. The objective of this study is to assess the efficacy of the fast-track pathway adopted within the IRCCS Galeazzi – Sant’Ambrogio Hospital (Milan, Italy) for patients undergoing hip or knee arthroplasty, in terms of length of stay and costs reduction, compared to the traditional approach.

Materials and Methods. The last biennium of traditional perioperative approach (2016/2017) and the first biennium of fast-track pathway (2018/2019) were compared in a retrospective study. The process of patients receiving elective hip or knee replacement at the hospital was analysed, from the preadmission to discharge, collecting flow, costs and clinical data from the hospital information system and medical records.

Results. Knee replacement mean costs are 5,569 € (\pm 1,171 €) and 4,557 € (\pm 1,037 €) respectively in the pre fast-track and in the fast-track period ($-1,011$ €; -18.2%). Hip replacement mean costs are 5,374 € (\pm 990 €) and 4,517 € (\pm 904 €) respectively in the pre fast-track and in the fast-track period (-857 €; -15.9%). The adoption of fast-track pathway led to a statistically significant decrease of days of hospitalisation of -1.7 in knee replacement, and of -2.0 in hip replacement.

Conclusions. In patients undergoing hip or knee replacement, the adoption the proposed fast-track pathway proved to reduce patients’ length of stay and care-related costs. Clinical data will be analysed in a future study to investigate the superiority of this fast-track pathway also in ensuring better outcomes.

IMPLEMENTATION OF FAMILY-CENTERED DEVELOPMENT ENHANCING CARE FOR PREMATURE INFANTS AT CHILDREN'S CLINICAL UNIVERSITY HOSPITAL, NEONATOLOGY CLINIC: CASE ANALYSIS

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Objectives. To study in depth the family-centered care implemented at the Neonatology Clinic of CCUH, which is based on the NIDCAP (Neonatal Individual Developmental Care Adapted Program) concept.

Materials and Methods. The research involved 60 members of a multi-professional team, 49 parents of premature infants. Questionnaires MOPC-SP (Assessment of the care process for service providers) and MPOC-20 (Assessment of the care process) were used. Individual semi-structured interviews were conducted with seven employees. Data were collected, processed, the results were analyzed with the methods of mathematical statistics, determining the indicators of central trends. Qualitative content analysis was used for the analysis of the interviews.

Results. A review of the literature is included in the master's thesis, the research clarifies the compliance of CCUH services with a family-centered approach, identifies the lowest rated sections, clarifies the clinic staff's understanding of family-centered care and its expression in practice, identifies barriers to implementation, draws conclusions and makes suggestions.

Conclusions. The care services provided by CCUH are generally in line with a family-centered approach, but care staff needs to improve the provision of general information and mutual understanding. The multi-professional team understands the concept of family-centered care as working together with parents to provide physical and emotional support to the mother, developing the role of the parent as primary caregiver to achieve the best possible psychoneurological outcome for the baby. The main obstacles faced by employees are work organization, heavy workload, lack of time, burnout, lack of motivation, lack of parental equality, as well as psychosocial factors in the work environment.

NON-ATTENDANCE AT PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL AND ASSOCIATED LOSSES

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Objectives. Non-attendance in healthcare results in longer waiting times for other patients, inflicts financial damage to healthcare providers and indirectly causes losses to the healthcare systems budget.

The aim of this study is to prove that a strict record keeping of non-attendance and enforcement of preventative measures is necessary at an institutional or national level.

Materials and Methods. Based on a mixed method approach the study uses

- literature data about non-attendance in healthcare, about methods that could be used to reduce the rate of no-show appointments
- non-attendance data from VSIA “Paula Stradiņa klīniskā universitātes slimnīca” outpatient service centre (record N = 160875; 2017–2019)
- calculates the losses associated with no-show appointments based on patients’ co-payment amount and doctors’ hourly salary data.....
- data on the expenses associated with introduction of no-show appointment preventative methods to calculate opportunity costs for different scenarios
- societies and expert opinion about different no-show preventative methods and strategies.

Results. In the period from 2017 till the end of 2019 16% of patients did not show up for an appointment with a doctor. This has resulted in losses of 805864.66 euro for the hospital in 3year time. Opportunity costs that are asociated with introduction of automated fine systema and information system would constitute 635912.66 euro and 80586.46 euro respectivley. When asked about preventative measures patients do admit fines are an effective way to reduce no-show rates. Industry leaders on the other hand are more careful with imposing fines and would prefer reminder strategies.

Conclusions. The calculated financial losses and their opportunity costs indicate a need to introduce non-attendance reduction measures. One of the most successful strategies – financially fining patients – is deeply looked at in this study and there is evidence from patients and industry leaders that it could potentially reduce losses and nonattendance rates.

PROCESS FLOWS OF AN EMERGENCY DEPARTMENT: HOW PROCESS MODELING AND SIMULATION CAN HELP IMPROVE EFFICIENCY AND QUALITY OF PATIENT CARE?

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Objectives. Emergency departments worldwide are the first point of contact for life-saving care. Despite this importance to patient care, emergency departments face a number of shortcomings. For example, emergency departments have been struggling with a lack of resources, compensation deficits, low level of digitalization and unregulated access to emergency departments for many years. To overcome these challenges despite limited resources, an emergency department must be characterized by good process flows. A well-designed process analysis using a discrete event simulation (DES) can support the implementation of improved workflows and thus sustainably improve the quality of care.

Materials and Methods. Based on empirical data obtained through observations, expert interviews, process analysis, and time studies, we analyze how process flows in the emergency department can be modeled and evaluated. A stochastic DES model is used to model and simulate the care flow at an emergency department of a primary care provider.

Results. The results of the DES study show that, in particular, digital upgrades to the emergency department and additional human resources can reduce process times in terms of length of stay and waiting times.

Conclusions. It can be concluded that discrete event simulation is a suitable tool to realistically model and simulate complex system such as the emergency department and to extract meaningful improvement potentials. In the future, the potential of information and communication technologies to improve process flows should be more strongly incorporated into DES studies. Because of increasing digitalization and the availability of real-time data, the potential of online DES models should have a greater consideration in the future.

RESPECT OF CHILDREN'S RIGHTS IN CLINICAL PRACTICE – DOES AGE MATTER?

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Objectives. The well-being, safety and interests of children are rooted in United Nations Convention on the Rights of the Child. It is essential that healthcare protocols and services are organized in compliance with the universal Convention principles. The study aims to determine whether the age of the patient is affecting the extent of the respect of children's rights.

Materials and Methods. Evaluation of the observance of Children's rights has been performed in the multi-specialty pediatric department of Children's Clinical University Hospital in April-May 2022. Children aged 5 to 11 ($n = 11$) and teenagers aged 12 to 17 ($n = 18$) were involved in questionnaires and interviews. Statistical analysis was made by SPSS 28.0 ($p < 0.05$). The study was approved by the Institutional Ethics Review Board.

Results. 72.7% of children noted personnel did not introduce themselves, and 11.8% of teenagers complied ($p = 0.003$). The median age of the group who did not know the name or occupancy of the caretaker was 7.5 years old, and the median age of the opposite group was 15 years. 27.3% of children understood everything said about their health condition, compared to 94.1% of teenagers ($p = 0.269$), with a median age of patients who responded positively of 15 years and negatively of 7 years. 27.3% of the children and 35.3% of teenagers asserted they did not receive enough information about their health condition ($p = 1$). 72.7% of children and 100% of teenagers acknowledged that their thoughts and opinions were considered, and 27.3% of children disagreed with this statement ($p < 0.001$). 18.2% of children and 5.9% of teenagers felt unsafe in the hospital ($p = 0.543$).

Conclusions. Younger children feel less safe in the hospital setup and less included in their own care. It is crucial to ensure any child's rights are protected and respected while planning the services and providing healthcare.

UPGRADED MANAGEMENT OF CHRONIC MYELOID LEUKEMIA

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Objectives. The objective of the study was the assessment of the management options in chronic myeloid leukemia (CML) in Moldova.

Materials and Methods. Materials and Methods: Our unicentric and case-control study included 134 CML patients, who were treated between 2007–2022 at the Institute of Oncology. The quantitative real-time PCR was used with the aim to determine the BCR-ABL gene p210 and p190 transcripts. The study was related to the ambulatory and hospitalized care. The treatment with tyrosine kinase inhibitors (TKIs) was provided as a donation by The Max Foundation via Max Access Solutions (MAS) program. Imatinib mesylate and nilotinib were used as a front-line therapy in the newly diagnosed CML patients and in the cases of resistance to non-TKIs chemotherapy and interferon- α .

Results. Results: The patients' age varied between 14–81 years old. The diagnosis of CML was confirmed in chronic phase in 122 ($91.04 \pm 2.32\%$) patients. The rate range of Ph-chromosome-positive bone marrow cells was 20–100%. In the majority of cases (72.7%) the Ph-chromosome was identified in over 70% of the bone marrow cells. BCR-ABL p210 transcript range was 21.84–100% IS. Under the therapy with TKIs the complete hematological response was obtained in 92.8% of cases, and the complete molecular response – in 27.4% of cases. There were no subsequent short-term hematological relapses. The overall one- and 5-year survival of CML patients treated with TKIs was 98.5% and 89% respectively.

Conclusions. Conclusions: MAS program proved to be an expanded partnership with local cancer centers reaching oncologic patients in low- and middle-income countries in order to offer a compilation of lifesaving drugs on a regular and equity basis. MAS program may be appreciated as an efficient, safe and reliable management option to provide potentially curable TKIs therapy for CML patients in the emerging regions regardless the age, gender and social categories.

USING THE WORKLOAD INDICATOR OF STAFFING NEED (WISN) – METHOD TO ASSESS HR REQUIREMENTS AND OPTIMIZE PROCESSES IN HEALTHCARE: EXAMPLE OF A NEUROLOGY TEAM OF THERAPISTS

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Objectives. Changing market conditions and increasingly scarce human resources require health care providers to analyze, review and constantly adjust their processes within their healthcare facilities. A personnel requirement assessment based on the WISN method has proven to be a useful instrument for personnel planning, but also for identifying potential for improvement and process optimization.

The aim of this research is by using the WISN personnel requirements assessment to analyze the status quo processes of a team of neurologists in a hospital and to identify possible weaknesses in the therapists' areas of activity as well as finding concrete measures for optimization.

Materials and Methods. A mixed method approach of a systematic literature analysis, determination of HR requirements based on the WISN method and a subsequent focus group discussion with experts are used to calculate HR requirements and to identify potential areas of process optimization.

Results. The results of the analysis show, that it is possible to calculate the required personal resources using the WISN- Method. Additionally, three support activities (daily documentation, weekly documentation and scheduling) which, at 5.5 hours/week per therapist, tie up considerable working time, could be identified. After implementing the optimization measures, a maximum of 1.42 full-time equivalents (FTE) therapists out of a team of 9.51 FTEs therapists could be saved or used for value-adding health activities.

Conclusions. It can be concluded that WISN is a good way to analyze the tasks and HR requirements of Healthcare Workers, especially therapists. This might help to identify potential task-shifting activities, avoiding duplicate working processes, increase the utilization of scarce resources and help to improve efficiency in health care institutions.

OCCUPATIONAL MEDICINE AND ENVIRONMENTAL HEALTH

BURNOUT SYNDROME OF ANESTHESIA AND INTENSIVE CARE NURSES

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Objectives. Burnout syndrome was defined as a psychological syndrome resulting from long-term exposure to chronic interpersonal stressors while at work. Burnout syndrome appears when work-related stress exceeds a person's adaptive level, or when a person's coping mechanism cannot control the pressure caused by stress.

Materials and Methods. In order to achieve the aim of the study – to study the indicators of burnout syndrome in practicing anesthesia and intensive care nurses – a quantitative cross-sectional descriptive study, as well as a correlation study, was conducted.

The quantitative research methods were applied using a research instrument: the Maslach Burnout Inventory. The inventory contains three subscales, which assess emotional exhaustion, depersonalization, and a sense of low personal achievement. Higher results on the EE and DP subscales are indicative of more pronounced burnout syndrome, while lower results on the LPA subscale are indicative of more pronounced burnout syndrome.

Results. Analysis of the data submitted by the respondents ($n = 184$) shows that the arithmetic mean is as follows: in the subscale of emotional exhaustion ($M = 24.16$; $SD = 9.07$), the subscale of depersonalization ($M = 8.65$; $SD = 5.18$), and in the subscale of sense of low personal achievement ($M = 29.96$; $SD = 6.72$).

Comparing the obtained data and the results of studies conducted in other countries, it can be concluded that Latvia has lower work capacity and professional achievements and a higher level of emotional exhaustion, which indicates pronounced burnout syndrome.

Conclusions. The results of the present study indicate a more negative trend than in previous studies in Latvia and other countries. This can be explained by the fact that the nurses filled out the surveys right during the COVID-19 pandemic. The studies conducted during the pandemic show that due to the pressure and workload caused by the pandemic, medical personnel has higher burnout rates, moral distress rates, increased workload and their psychological condition has deteriorated.

DETERMINATION OF SLEEP HYGIENE INDEX FOR OFFICE EMPLOYEES

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Objectives. Good quality sleep is very important for good health and wellbeing. Sleep hygiene includes a set of various measures, such as the regularity of getting up and going to bed, that can affect and improve the quality of sleep. Health promotion measures and a work environment that supports sleep health can increase work capacity, productivity and reduce the risk of accidents at the workplace.

The aim of this study was to investigate sleep hygiene index for office employees in medium sized administrative work related organization.

Materials and Methods. Survey with response rate of 96 employees was used and sleep hygiene index was calculated. In order to calculate the sleep hygiene index, respondents had to answer 13 questions. The score of the sleep hygiene index indicates what kind of sleep hygiene a person has. The number of points range from 0 to 52 points. When obtaining the sleep hygiene index, sleep hygiene can be divided into categories: very poor, poor, average and good sleep hygiene. The higher the number of points, the worse the sleep hygiene.

Results. The average score of sleep hygiene for office employees is 19.35 (SD = 6.24), describing the sleep hygiene of office employees as average. Analyzing the sleep hygiene of office employees, it can be concluded that 15.5% of respondents' sleep hygiene is good, 75% of office employees' sleep hygiene can be described as average, 9.5%'s sleep hygiene is poor. None of the respondents have very poor sleep hygiene.

Conclusions. Determination of the sleep hygiene index makes it possible to evaluate the sleep hygiene of the employees in the office work and the employees' attitude to their health. The application of this method is convenient to use and the obtained results will help to develop health promotion measures.

EVALUATION OF CORRELATION BETWEEN SLEEP AND PSYCHIATRIC DISORDERS IN POPULATION OF NIGHT SHIFT WORKERS: PILOT STUDY

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Objectives. Insomnia is the perception of inadequate, insufficient or non-restorative sleep. Of all sleep-related disorders, insomnia is the most common. It is important to remember that the sleep-wake cycle also plays a central role in the genesis of anxiety and depression. The aim of our study is to evaluate the association between sleep disturbances and anxiety and depression, in a group of workers of both sexes who perform night shifts work.

Materials and Methods. Information on sleep disorders was collected by administering the Insomnia Severity Index (ISI) questionnaire. Statistical analysis was conducted using the Chi-square test, to assess whether there were any differences between sex, those who were healthy, or who were diagnosed with psychiatric disorders at the time of their medical history.

Results. The results showed that there was a good percentage of subjects with insomnia problems, impairing normal daily activities and promoting the onset of fatigue, daytime sleepiness, cognitive performance deficits, and mood disorders.

Conclusions. We have highlighted how anxious and depressive anxiety disorders are more pronounced in people who suffer from altered sleep-wake rhythms. Further research in this direction could prove to be fundamental for understanding the genesis of the onset of other disorders as well.

EXPRESSION OF STATHMIN IN ASBESTOS-LIKE FIBERS-INDUCED MALIGNANT PLEURAL MESOTHELIOMA: PRELIMINARY REPORT

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Objectives. Malignant mesothelioma is causally correlated with exposure to asbestos fibers and also with ‘naturally occurring asbestos’ fibers. Among these, there is the fluoro-edenite, a silicate mineral identified in the rock cavities inside the quarry of Monte Calvario located in the southeast of Biancavilla (Sicily, Italy). Malignant mesothelioma carries poor outcomes, and it is often diagnosed at an advanced stage due to the lack of diagnostic and prognostic biomarkers. To date, the most relevant prognostic parameters for malignant mesothelioma are represented by the histological subtype, gender, and age at diagnosis. In this context, several studies have already demonstrated how stathmin, a cytosolic protein that regulates cell growth and migration, is overexpressed across a broad range of human malignancies. However, no studies have correlated the expression of stathmin with the survival of malignant mesothelioma patients or with the clinical-pathological variables of the patients.

The aim of the study is to investigate the immunoexpression of stathmin in a subset of patients affected by malignant mesothelioma induced by environmental exposure of fluoro-edenite fibers, to verify if stathmin may represent a prognostic biomarker for malignant mesothelioma, and to evaluate the capacity of identifying promptly the patients’ prognosis.

Materials and Methods. Ten MPM tissue samples, from patients with available clinical and follow-up data, were included in paraffin and processed for immunohistochemistry.

Results. Our results showed a trend of shorter overall survival in malignant mesothelioma patients with stathmin overexpression. Furthermore, there was a significant correlation between stathmin expression and the survival time of malignant mesothelioma cases.

Conclusions. Immunohistochemical expression of stathmin may represent a potential prognostic biomarker for malignant mesothelioma, and could serve to evaluate the capacity of identifying promptly the patients’ prognosis to give indications to clinicians for their therapeutic approach.

INDOOR AIR QUALITY MEASUREMENT IN HOUSEHOLD DURING HEATING SEASON AND NON-HEATING SEASON

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Objectives. It is crucial to understand more about indoor air quality (IAQ) as changes in the ambient atmosphere at home can affect wellbeing and productivity. It is uncertain whether pandemics will recur or if other causes may push individuals to spend more time at home than they do now since technology is developing so rapidly. Through this study, it is hoped to define and comprehend the effects that various home activities, heating season etc. can have on IAQ.

Materials and Methods. Monitoring were automatically recorded and took place in non-heating and heating season, using: PCE-PCO1, PCE-RCM16, “Aranet4” and LMT monitoring logger for measurements of PM, total volatile organic compounds, AIQ, temperature, atmospheric pressure, relative humidity and CO₂. The building has a gas heating system and natural ventilation, excluding vent in the kitchen. BreezoMeter mobile application for outdoor/indoor air monitoring was used.

Results. The average temperature and humidity in the non-heating season was 21.1°C and 38.9%, in the heating season – 22.3°C and 33.9%. In both seasons CO₂ increased more than 1000 ppm while cooking on a gas stove. In the heating season PM10 concentration is 4 µg/m³ more and in the non-heating season is 5 µg/m³ more, but PM2.5 concentration is significantly higher in both seasons.

Conclusions. Mainly, the air quality in this household is good, except PM. The IAQ in an apartment may be managed by buying specialized equipment that monitor the IAQ and, depending on the results, take different steps to enhance it generally or, if any indication is out of limits, alter it until it is normal or at least near to normal.

INTERACTION BETWEEN PHYSICAL AND PSYCHOEMOTIONAL LOAD FOR OPERATING UNIT HEALTH STAFF

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Objectives. In the healthcare sector, the surgical methods and technologies are constantly evolving, exposing employees to both physical and emotional workload. According to the authors' research, high mental, physical demand, effort and increase in workload were found after various surgical procedures. The technologies and tools used during work affect the workload and the interaction between a person and a machine. The aim was to investigate the interaction between physical and psychoemotional load for the operating unit health staff.

Materials and Methods. NASA TLX method for subjective load assessment was applied, which assesses the mental stress of working people and the interaction of physical load.

The measurements were made for operating block staff in such professions: surgeons, nurses and surgeons- residents.

Results. Analysing the obtained results, it was concluded that mental workload (85 points) is most highly valued in the surgeons profession. In the nursing profession, the highest load rate is for physical load (79 points), which shows that the work tasks to be performed require a high physical load related to the severity of work, intensity such as moving patients etc. Surgeons-residents consider effort (72 points) as the main load, indicating that work has to be done hard both physically and mentally to achieve the required quality of work. Comparing all groups of professions, the results show that surgeons (77 points), nurses (73 points) and surgeons-residents (70 points) have the highest workload.

Conclusions. Both mental and physical workload of the operating unit staff can be assessed as high, which interacts with the temporal workload and effort and is explained by the fact that nowadays operations are becoming more complex, new technologies are being applied, often the working environment is not in line with ergonomic requirements, teamwork, fast pace of work and when these factors interact with each other, they increase both mental and physical workload.

INTERNAL AND EXTERNAL MOTIVATING FACTORS AND BARRIERS INFLUENCING PHYSICAL ACTIVITY INVOLVEMENT IN OFFICE WORKERS

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Objectives. The office workplace is considered as a significant risk setting for long-term sedentary behavior, which can lead to various adverse health consequences. Therefore, the purpose of this study was to identify obstacles, internal and external factors that motivate office workers, who spend a significant part of their workday sitting, to engage in physical activity.

Materials and Methods. A cross sectional study was conducted by collecting data from anonymous online survey of Latvian office workers, which was carried out from April to May of 2022. Internal and external motivational factors for engagement in physical activity at the workplace were assessed by 5-point Likert scale. Frequency analysis and Pearson chi-square test were used.

Results. A total of 232 respondents were included in this study (mean age 38.7 ± 11.6 years), 79.3% females ($n = 184$) and

19.8% males ($n = 46$). 60.3% ($n = 140$) of participants mentioned that one of the main barriers to being physically active is highly intensive work tasks. Major motivating factors to engage in physical activity at the workplace are employer provided motivational system (47.0%; $n = 107$), physical activity classes lead by specialists at the workplace (44.4%; $n = 103$), accompaniment by colleagues (43.5%; $n = 101$), employer-provided standing desks in the workplace (38.8%; $n = 90$). Notification systems, such as smartwatches, most likely would not increase the physical activity level of the office workers in the long term.

Conclusions. Social engagement factors like co-workers' involvement in physical activities and resources provided by the employer predict higher individual office worker involvement in physical activity at the workplace, in contrast significant barriers for physical movement are linked to intensive work and shortage of time. Such findings must be implemented in organizing health promotion interventions for office workers.

IS THERE A LINK BETWEEN LIFE SATISFACTION AND RISK OF ALZHEIMER'S DISEASE?

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Objectives. Neurological and psychological issues are two of the most common health problems negatively affecting the quality of life as well as the longevity of the global population. Furthermore, it is reported that depression and dementia are closely linked, and having depression symptoms is a risk factor for developing dementia. On the other hand, the lack of life satisfaction is one of the important factors that induce mental problems. In this study, we investigated the relationship between life satisfaction and the risk of Alzheimer's disease (AD)

Materials and Methods. This cohort study included 11,004 participants from the UK Biobank consisting of two groups: 10,040 individuals in the control group who were not diagnosed with AD and did not have any member of the family who was diagnosed with AD and 964 individuals in the dementia diagnosis group. We performed regression analyses to explore the potential link between the AD diagnosis and the total life satisfaction of an individual, as indicated by self-reported work/job, health, friendship, and financial satisfaction

Results. As a result, we observed that the AD diagnosis was statistically significantly associated with total life satisfaction. In particular, the satisfaction related to work/job, health, and financial situation, strongly differentiated people with or without AD.

Conclusions. We conclude that total life satisfaction may be related to AD risk and that improving life satisfaction may help minimize age-related cognitive decline. However, further studies are necessary for the definitive establishment of a causal relationship.

MODELLING OF 3D PRINTER EMISSIONS DEPOSITION IN HUMAN RESPIRATORY TRACT AND POTENTIAL INFLAMMATORY PROCESSES

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Objectives. Particulate matter(PM) is one of the main elements of air pollution. PM can be divided based on its diameter size into: **coarse** ≤ 10 microns(PM_{10}), **fine** ≤ 2.5 microns($PM_{2.5}$) and **ultrafine** ≤ 0.1 microns($PM_{0.1}$), consequently, will have different deposition capacity in the human respiratory tract(HRT).

This research aims to determine the deposition fraction(DF) of PM emitted during the 3Dprinting process in different regions of the HRT based on mass concentration(MC) and geometric mean diameter(GMD). Also, do the systematic review based on deposition modeling regarding inflammatory processes and as consequence possible pathologies.

Materials and Methods. The research was carried out within a project of National Programme Grants(RSU Grants) “Occupational health and safety risks during 3D printing”6-ZD-22/22/2022. We studied PM deposition in HRT-entire, generation-specific; upper/lower, lobar and central/peripheral lung tissues using the Multiple Path Particle Dosimetry Model(MPPD-V3.04).

Results. The biggest DF in entire HRT is PM_{10} (0.9566) and the smallest $PM_{2.5}$ (0.2089). The biggest DF in lower respiratory tract(LRT) is $PM_{0.1}$ (0.4868), the smaller DF is PM_{10} (0.1853) and the smallest DF is $PM_{2.5}$ (0.1225).

$PM_{0.1}$ deposits mainly in lungs(56%), $PM_{2.5}$ mostly deposits in the upper respiratory tract(URT)(41%) and lungs(39%), but PM_{10} mostly deposits in the URT(81%).

The biggest DF in lung for all PM-lower lobes(range: $PM_{2.5}$ 60- PM_{10} 61%), smallest-right middle lobe. DF of all PM starts to progress on the level of respiratory bronchioles and reaches its maximum at alveolar sacs. All PM DF is bigger in peripheral lung region(range: PM_{10} 69- $PM_{0.1}$ 71%).

Conclusions. The biggest DF in HRT as a whole is coarse(PM_{10}), but in the LRT ultrafine($PM_{0.1}$). All of the PM are depositing mostly on the level of alveolar sacs, lower lobes and peripheral tissue of the lungs. PM decreasing in diameter, tend to deposit mostly in the deeper levels of HRT, therefore catalysing inflammatory processes, which could lead to the chronic inflammation and damage of the different organ systems.

MUSCULOSKELETAL DISORDERS AND INCONGRUOUS POSTURES IN WORKERS ON ROPES: PILOT STUDY

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Objectives. Occupational hazards believed to cause musculoskeletal disorders in rope workers are traditionally associated with maintaining incongruous postures for prolonged periods of time.

Materials and Methods. A cross-sectional survey was conducted on 132 technical operators in the wind energy and acrobatic construction sectors, who work on ropes, analysing the ergonomic characteristics of the environments, the way in which tasks are carried out, the strain perceived by individual workers, and assessing the presence of any musculoskeletal disorders (MSDs) by means of an objective examination focused on the anatomical districts that were the object of our study.

Results. Analysis of the data obtained showed that there were differences in the perception of the level of physical intensity and perceived exertion between the groups of workers. Statistical analysis also revealed a significant association between the frequency of MSDs analysed and perceived exertion.

Conclusions. The most significant finding to emerge from this study is the high prevalence of MSDs of the cervical spine (52.94%), the upper limbs (29.41%), and the dorso-lumbar spine (17.65%). These values differ from those classically found in those exposed to the risk of conventional manual handling of loads.

The high prevalence of disorders of the cervical spine, the scapulo-humeral girdle and the upper limbs, indicates the need to consider the forced position to be assumed for a large part of the work activity, staticity, and the inability to move the lower limbs for long periods as the predominant risk in rope work.

OVERWORK ASSOCIATION WITH SICKNESS ABSENCE AND SICKNESS PRESENTEEISM: RESULTS FROM POOLED DATA SURVEY ON WORKING CONDITIONS IN LATVIA

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Objectives. The costs related to sickness absence as well as sickness presence are a substantial burden to employers, governments, and sick employees themselves. Although by definition, sickness absence is an absence from work due to personal illness, it is a more complex phenomenon. Underlying factors that affect going to work despite illness or taking certified sickness absence differ. It is influenced by both – work-related factors and personal factors. The study aimed to investigate the association between individual overwork (working for more than one employer and working overtime) and sickness presenteeism and absenteeism.

Materials and Methods. The study used cross-sectional survey data representative of the working population of Latvia and pooled from four periodic surveys – Work conditions and risks in Latvia (2006–2018). The study sample ($n = 9086$) consisted of employees between 16 and 80 years old (average 42.8 ± 12.5) – 45.9% males and 54.1% females. The association between overwork and sickness presenteeism and absenteeism was analyzed by using multinomial logistic regression and calculated as odds ratios (OR) with 95% confidence intervals (CI), with adjustment for gender, age, education, and survey year.

Results. The odds of sickness absence were higher among employees working overtime often (OR = 1.58, CI 1.34–1.85, < 0.001) or sometimes (OR = 1.45, CI 1.29–1.63, < 0.001) if compared with those who do not work overtime. Overtime work has even stronger association with sickness presenteeism than absenteeism (often: OR = 3.37, CI 2.67–4.25, < 0.001 ; sometimes: OR = 1.64, CI 1.34–2.02, < 0.001), but for both associations are significant.

Working for more than one employer is significantly associated with sickness presenteeism (OR = 1.53, CI 1.15–2.03, $p < 0.01$), but not with sickness absenteeism.

Conclusions. Our findings suggest that overwork has higher odds for sickness presenteeism as well as sickness absenteeism, however, further analysis is needed to identify mediating factors explaining the underlying mechanisms for the association between presenteeism, absenteeism, and overwork.

PESTICIDE EXPOSURE OF RURAL AND SUBURBAN AREA INHABITANTS IN LATVIA

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Objectives. Humans are exposed to pesticides via several routes. National data is crucial to limit pesticide use and provide information for policy makers. This study aims to identify the most common pesticides present in Latvian inhabitant urine samples and link the findings with possible sources of exposure.

Materials and Methods. In 2020, 402 urine samples were collected, analysed. Further research was conducted for chemicals present in more than 10% of the samples. To identify potential sources of pesticide exposure, literature research was done. The use of particular pesticides was linked using the State Plant Protection Service of the Republic of Latvia database.

Results. Eight pesticides were identified in more than 10% of the tested urine samples: Acetamiprid (32.40%, n = 132), Chlorpropham (31.59%, n = 127), Boscalid (18.41%, n = 74), Triclosan (16.17%, n = 65), Fludioxonil (14.68%, n = 59), Pyrimethanil (14.43%, n = 58), Imazalil (10.70%, n = 43) and PirimiphosMethyl (10.20%, n = 41).

Acetamiprid and Chlorpropham were not allowed for use in Latvia at the time of sample collection. Boscalid and Fludioxonil are used in Latvia for the protection of various cultures against fungus. Triclosan's antibacterial and antifungal properties make it a common ingredient in personal hygiene products, while fungicides like Pyrimethanil and Imazalil, which are typically used to treat fruits, are not registered for national use. PirimiphosMethyl is allowed for treating seeds and storage spaces in Latvia.

Conclusions. Pesticide exposure of the inhabitants of Latvia is mainly linked to food intake, use of personal care products and agricultural activities close to the living area. Results on Acetamiprid and Chlorpropham reveal exposure from foods that are not locally cultivated, suggesting that a reduction in intake of such fruits and vegetables could minimize overall pesticide exposure. Public education on wiser decisions on the use of food and personal care products could also contribute to the reduction.

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TELEWORKER CHOICES OF INFORMATION SOURCES ON HOME OFFICE ERGONOMICS DURING THE COVID-19 PANDEMIC IN LATVIA

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Objectives. Although remote work in Latvia was carried out already before the COVID-19 pandemic, most companies were not ready for the rapid increase of teleworkers. This resulted in poor ergonomics of remote workplaces. To identify sources of information on possible workplace adjustments used by teleworkers, answers from surveys gathered during three waves of the COVID-19 restrictions were analyzed.

Materials and Methods. Data were collected through three web-based surveys in 2020, 2021, and 2022. Further data analysis included a total of 1,598 teleworkers (n = 483, n = 546, n = 569, for relevant years).

Results. Approximately 30% of workers who did not have a suitable remote workplace before the COVID-19 pandemic, searched for information on the proper setup of the home office (during the 1st wave 23.4%, 2nd wave 27.1%, 3rd wave 40.2%). Most often, the Internet was mentioned as the source (1st wave 44.3%, 2nd wave 52.9%, 3rd wave 41.4%), and only then – specialised websites related to the working environment, e.g., the State Labour Inspectorate or stradavesels.lv (1st wave 36.1%, 2nd wave 46.0%, 3rd 41.4%). Even less frequently, the respondents asked for assistance from their employer or the company's occupational health and safety expert (1st wave 21.3%, 2nd wave 10.3%, 3rd wave 25.0%).

Conclusions. Although the provision of healthy and safe workplaces is the responsibility of the employer, employers and the company's occupational health and safety expert were not the first choice of the teleworkers. On one hand, this raises the question of the involvement of workers in the management of the OSH system in general, on the other hand, this provides data on the need for the provision of specific information on different websites. This is essential for better preparedness for future emergencies.

PSYCHOLOGICAL CARE

ADAPTING TO CHANGE: STUDY OF PSYCHOLOGISTS' PROFESSIONAL IDENTITY IN THE FACE OF COVID-19 PANDEMIC AND DIGITALISATION

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Objectives. Professional identity is an individual's sense of self that is defined by their profession. It is both an individual and social construct, meaning that it is developed from a combination of personal and social influences. In times of change, professional identity is important as it provides individuals with a sense of stability and purpose. This helps them to adapt and find success in a new environment or situation. This study aimed to investigate how the professional identity of psychologists is affected by the current times of change, specifically the COVID-19 pandemic and the rapid entry of digitalization into professional life.

Materials and Methods. A sample of 51 psychologists aged from 28 to 64 ($M = 46.26$), 86% female, 14% male from different areas of professional activity were interviewed using semi-structured questions. The data were analysed using thematic analysis.

Results. The results showed that the professional identity of psychologists is characterized by themes of adaptability and resilience, self-awareness, flexibility and open-mindedness, professional competence, emotional intelligence, transition, and boundaries. The results can be used to promote professional development and training programmes, highlighting the need for ongoing support to help professionals maintain a strong and effective professional identity in times of change.

Conclusions. This study provides valuable insights into the professional identity of psychologists in times of change. The results suggest that in order to navigate the challenges and opportunities presented by the current environment, psychologists must be flexible, adaptive, and open to new professional opportunities, while also possessing strong emotional intelligence, self-awareness and manage personal and professional boundaries. These findings can be used in the ongoing development and support of psychologists and other psychological help providers to overcome current and future challenges.

BURNOUT AMONG HEALTHCARE PROFESSIONALS DURING COVID-19

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Objectives. COVID-19 is a global health crisis, which created an additional burden on the healthcare system, causing enormous stress and burnout among healthcare professionals. The aim of the research is to investigate the burnout and professional deformation of healthcare professionals during COVID-19.

Materials and Methods. Respondents of the research (n = 195) – doctors, residents, nurses, medical assistants. N = 164 – female, n = 31 – male. In this cross-sectional research was investigated using the MBI (Maslach burnout inventory – Human Services Survey) survey. A survey created by the author was used to determine the professional deformation, where 4 subscales were distinguished: aggression, authoritarianism, demonstrativeness, conservatism.

Results. The results showed a high level of emotional exhaustion, a medium level of depersonalization, and a low level of personal achievement reduction. The Professional Deformation Survey provided good reliability for the total sample: aggression ($\alpha = 0.62$), authoritarianism ($\alpha = 0.63$), demonstrativeness ($\alpha = 0.60$), conservatism ($\alpha = 0.79$). The results of the professional deformation – 24% of the respondents display aggression in their professional activities. Authoritarianism can be observed in 16% of the respondents, demonstrativeness in – 28%, and professional deformation manifests itself as conservatism in 17% of medical personnel. A positive correlation was seen in the following scales: aggression – emotional exhaustion $r = 0.320$, $p < 0.000$, aggression and depersonalization $r = 0.417$, $p < 0.000$, demonstrativeness and reduction of personal achievements $r = 0.293$, $p < 0.000$, conservatism and emotional exhaustion $r = 0.246$, $p < 0.001$, conservatism and depersonalization $r = 0.297$, $p < 0.000$. Significant negative correlation was observed for demonstrativeness and emotional exhaustion: $r = -0.141$, $p < 0.050$.

Conclusions. The results highlight the increased emotional burnout and evident professional deformation of medical professionals during the COVID-19 pandemic. A set of preventive measures should be seriously considered in order to reduce the emotional burnout tendencies of medical personnel, as well as to promote the efficiency of the health system.

CONVERGENT VALIDITY OF THE LATVIAN CLINICAL PERSONALITY INVENTORY (LCPI) COMPULSIVITY FACTOR AND PERFECTIONISM PERSONALITY TRAITS

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Objectives. Latvian Clinical Personality Inventory provides a significant contribution to personality research in clinical field (Kolesnikova et al., 2020). However, revisions of LCPI factors are valuable. Study compared the convergent validity of LCPI Compulsivity factor and Perfectionism personality traits. According to previous studies significant correlations should be expected between Compulsivity factor and Perfectionism personality traits (Frost et al., 1990; Taranis & Meyer, 2010; Smith et al., 2022). The aim of the study was to examine the convergent validity of LCPI Compulsivity factor and Perfectionism personality traits.

Materials and Methods. The data of 189 participants (69%female; aged 16–65; M = 35.67; SD = 13.06) were analyzed. Participants filled socio-demographic questionnaire, The Latvian Clinical Personality Inventory (LCPI); The Big Three Perfectionism Scale (BTPS); Multidimensional Perfectionism Scale (HFMDPS); Frost Multidimensional Perfectionism Scale (FMPS).

Results. The results show significant correlations between LCTP Compulsivity scale and different perfectionism factors: BIG3 ($r = 0.265^{**}$ – 0.422^{**}), strongest for Rigid perfectionism ($r = 0.384^{**}$), Self critical perfectionism ($r = 0.410^{**}$) and Self criticism ($r = 0.422^{**}$); HFMDPS ($r = 0.403^{**}$ – 0.239^{**}), strongest for Self oriented perfectionism; FMPS ($r = 0.161^{*}$ – 0.476^{**}) strongest for total Perfectionism ($r = 0.431^{**}$) and Doubts about actions ($r = 0.476^{**}$).

LCTP's Compulsivity subscale Perfectionism shows significant correlations between BIG3 ($r = 0.221^{**}$ – 0.455^{**}), strongest for Self critical perfectionism ($r = 0.455^{**}$) and Self criticism ($r = 0.389^{**}$); HFMDPS ($r = 0.147^{*}$ – 0.271^{**}) none is particularly strong; FMPS ($r = 0.196^{**}$ – 0.594^{**}), strongest for Doubts about actions ($r = 0.594^{**}$) and rather strong for total Perfectionism ($r = 0.406^{**}$).

LCTP's Compulsivity subscale Pedantry shows significant correlation between FMPS's subscale Organization ($r = 0.669^{**}$).

Conclusions. The results show rather strong evidence for convergent validity of LCPI's Pedantry and FMPS's Organization, as measuring the same concept.

LCPI's Perfectionism is best explained by Doubts about actions and Self criticism, which are significant Perfectionistic traits that are in the line with previous findings, supporting the evidence of convergent validity.

Obtained results add deeper insight into understanding the relationship between Compulsivity factor and Perfectionism personality traits. It is of importance to continue to study the validity of other factors of LCPI.

DEVELOPMENT OF MUSIC- AND WEB-BASED INTERVENTION CONTENT TARGETING SELF-CARE BEHAVIOUR CHANGES

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Objectives. Self-care is an accessible resource to maintain one's health and well-being in the face of an individual or societal crisis. However, recent research reveals the necessity to encourage changes in self-care behaviour to meet individuals' needs and preferences. In response to the trend towards digital transformation in psychological counselling and healthcare, transdisciplinary solutions are promising for the development of behaviour change interventions. The study aimed to develop the content of a music- and web-based intervention targeting self-care behaviour changes in general adult population.

Materials and Methods. The study was based on the conceptualization of self-care proposed in the Self-Care Strategies Questionnaire (Mārtinsone et al., 2022) that identified 14 self-care strategies applied to personal and/or professional life. The music- and web-based content addressing every strategy was developed. Intervention Mapping was used as a methodological framework. The intervention design team (n = 5) and external experts (n = 7) were involved in all phases of the development. The experts were selected based on their experience in health psychology or music therapy. The data provided by team members and experts was collected using the content assessment questionnaire. 14 criteria were assessed in a 3-point Likert scale. To process the data the content validity index was calculated.

Results. According to the steps of Intervention Mapping, the behaviour change outcomes, determinants and change objectives were developed. Additionally, therapeutic factors were developed to address the specifics of a music-based intervention. Behaviour change methods were selected and their practical applications designed. Although the preliminary version of the content demonstrated acceptable validity for most of criteria (CVI \geq 0.70), except practical applications, many items were revised or withdrawn by the intervention design team after analyzing the experts' suggestions.

Conclusions. A systematic process based on Intervention Mapping methodology resulted in development of a theory-informed intervention content. Engagement of external experts contributed to reliability of the results.

DIFFERENCES BETWEEN VACCINATED AND UNVACCINATED PEOPLE IN FEAR OF COVID-19, FEAR OF COVID-19 VACCINE AND FEAR OF COVID-19 VACCINE SIDE EFFECTS

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Objectives. The aim of this study is to investigate the differences in fear of COVID-19, fear of COVID-19 vaccine and fear of COVID-19 vaccine side effects between vaccinated and unvaccinated people in Latvia.

Materials and Methods. Data were collected from a representative sample of Latvian residents (N = 644, aged from 18–75, men 46.5%, women 53.5%). Direct interviews were performed at respondent's homes. Carried out in the frame of the National research program Challenges and Solutions of Latvian State and Society in an International Framework (INTERFRAME-LV). The data was collected by the research center, which is a private and independent research company. From the full survey, this study examines psychological factors, such as fear of COVID-19 (1 item), fear of COVID-19 vaccine (1 item), fear of negative effects of the COVID-19 vaccine (5 items) and risk appraisal (1 item), of people who have been vaccinated and those who refuse to get a vaccine.

Results. The results showed that there are statistically significant differences between people who are vaccinated and those who refuse to get a vaccine. People who have not been vaccinated believe that they are not afraid of COVID-19 but are afraid of the COVID-19 vaccine and its possible side effects.

Conclusions. To raise vaccination rates and reach adequate levels of immunization, health authorities should take these findings into account and develop focused public health programs aimed at vulnerable populations during the present and upcoming pandemics.

EMORI MOBILE APP FOR EMOTION REGULATION – PROTOTYPE APPROBATION

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Objectives. The use of mobile apps interventions is rapidly growing in psychological care, including for various topics related to emotions. EMORI is a Latvian mobile app prototype aiming to assess emotion regulation skills (providing feedback to the user) and offer art therapy-based and psychological exercises for improving those skills. EMORI was created as a research project by a team of researchers from three Latvian Universities (Rīga Stradiņš University, Latvian Academy of Arts, Ventspils University). The aim of the project was to create a digital psychological intervention in the Latvian language. The objective of this study was 1) before programming the app, to check whether the intervention improves the participants' emotion regulation (ER) skills, 2) to collect opinions and impressions of experts and users of this app.

Materials and Methods. In a pilot study, 34 participants received an intervention protocol via e-mail and independently completed three weeks of mood monitoring, art-based exercises using Infinite Painter and PicJointer apps. Participants also wrote a diary. Differences in ER skills before and after the intervention were determined using the Emotion Regulation Skills Questionnaire (ERSQ, Berking & Znoj, 2008). In the second stage of the research, six experts and six users evaluated the EMORI prototype, semi-structured interviews were conducted.

Results. The Wilcoxon signed-rank test was used to evaluate the differences in ER skills before and after the intervention. The results indicate that there are a statistically significant differences in several ERSQ scales: acceptance ($W = 311.5$, $p = 0.003$), understanding ($W = 302$, $p = 0.001$), modification ($W = 202$, $p = 0.045$), total ER skills ($W = 500.5$, $p = 0.001$). The app's content received positive evaluations from experts, and overall feedback from app users was also positive.

Conclusions. Approbation of the EMORI prototype is only in its early stages, but results show improvement in some ER skills. EMORI can serve as a support tool for emotion regulation, and its development should continue.

PSYCHOMETRIC PROPERTIES OF MONTREAL COGNITIVE ASSESSMENT V8.2 TEST: PILOT STUDY

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Objectives. The world is rapidly ageing and, with increasing age, there is also a potential increase in patients with Alzheimer's disease and dementia. This calls for a reliable screening tool that could easily and rapidly identify the symptoms of pathological cognitive decline. As currently such tools are not available in Latvia, the objective of this study was to examine the psychometric properties of the newly translated Montreal Cognitive Assessment test.

Materials and Methods. 65 Latvian native speakers aged 55–90 ($M = 49.93$, $SD = 19.22$) participated in the study and were divided into three groups – with diagnosis of dementia ($n = 21$), mild cognitive impairment ($n = 18$) and control group ($n = 26$). All participants were assessed using the Montreal Cognitive Assessment test (Nasreddine et al., 2005), and a test-retest was conducted after 2 weeks ($n = 37$).

Results. Almost all reaction indices and inter-item correlation coefficients were acceptable (0.2–0.8), apart from indices in the Naming task and Verbal fluency task. The test showed very high reliability scores ($\alpha = 0.949$), that were also satisfactory to high in the subscales of the test (ranging from .74–.92) apart from the Naming ($\alpha = 0.65$) and Verbal fluency ($\alpha = 0.50$) scales. The test-retest reliability showed consistent results ($r = 0.975$).

Conclusions. Overall, the results from the pilot study show acceptable psychometric properties; however, two of the subscales should be revised. The pilot study should be continued and criterion validity tested.

RELATIONSHIPS BETWEEN UNUSUAL PERCEPTIONS, UNUSUAL BELIEFS AND SPIRITUAL EXPERIENCE

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Objectives. Having unusual beliefs and unusual perceptions, like magical thinking, ideas of reference, and hallucination-like experiences have long been considered symptoms of mental illness, schizophrenia, schizotypal personality disorder and schizotypy as a pathological personality trait complex, to mention a few. Although psychotic symptoms are considered highly pathological, studies show that they are not always necessarily associated with mental illness (Yaden & Newberg, 2022). The difficulty to recognize spiritual phenomena from pathology is one of the complications that professionals face when working with clients who experience altered states of consciousness (Schapiro, 2018).

Materials and Methods. This study aimed to investigate the relationship between spiritual experience and schizotypal personality traits in a sample of 299 non-clinical Latvian women. Data were collected using three self-assessment scales – Mysticism Scale (Hood, 1975; Hood et al., 2001) adapted into Latvian (Bitēna & Mārtinsone, 2020), Latvian Clinical Personality inventory (Perepjolkina et al., 2020) and sociodemographic data survey.

Results. The results show no significant correlation between a spiritual experience (mystical experience) and the overall indicator of schizotypy ($r_s = 0.17$, $p = 0.003$). Results showed that only two of the nine schizotypy traits were significantly positively related to spiritual experience – unusual beliefs ($r_s = 0.41$, $p < .001$), and unusual perceptions ($r_s = 0.37$, $p < 0.001$).

Conclusions. The results can be interpreted as supportive to the view that unusual beliefs and unusual perceptions are not always symptoms of mental illness. The results offer a topic for the discussion of why spiritual experience and schizotypal personality traits overlap. This research also adds evidence for further debate, on why spiritual phenomena are often considered pathological. These findings are helpful for further research that aim to distinguish the symptoms of mental illness from the signs of spiritual experience.

RESILIENCE IN PEOPLE WITH CHRONIC MUSCULOSKELETAL PAIN – PRELIMINARY RESULTS OF THEMATIC ANALYSIS

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Objectives. Qualitative studies can provide a deeper understanding of reasons, why some individuals are more resilient and have a better quality of life and health behaviour despite chronic pain. The purpose of this presentation is to provide the preliminary results of the thematic analysis on how people with chronic musculoskeletal pain (HMP) describe their experience regarding the maintenance of resilience in long term.

Keywords: chronic musculoskeletal pain, qualitative research, resilience, thematic analysis

Materials and Methods. Within a framework of the qualitative research strategy, semi-structured interviews with 17 research participants between the ages of 29–64 were conducted. People with HMP were purposefully selected for this study. The interview transcripts were analysed using a reflexive thematic analysis by Braun and Clark (2006).

Results. Three main themes with indicative subthemes were extracted from the interviews. People with HMP, prone to maintain their resilience in long term, 1) use cognitive emotion regulation strategies (cooperating with the disease rather than trying to defeat it, letting go of unrealistic expectations, setting positive reappraisal, seeing the meaning of life despite limitations caused by pain) 2) take responsibility for lifestyle (including regular physical activity or rehabilitation in daily routine, planning time for hobbies or activities that give pleasure and allow not to focus on the pain, reduce stress-causing factors), 3) seek informative, emotional, and practical support from family, friends, patient organizations, and health professionals, but at the same time not remain dependent on external support.

Conclusions. The ability to maintain resilience in the long term depends on the individual's self-discipline and daily habits, readiness to change mindset as well as willingness to accept support when needed.

STUDY OF TEACHER WELLBEING IN POST-PRIMARY SCHOOLS IN IRELAND, 2022

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Objectives. Studies linking teacher stress to the growing attrition of teachers from the workforce dominate the literature, yet there is a dearth of research on how to foster teacher wellbeing despite evidence of its impact on teacher retention, effectiveness and on student wellbeing (McCallum, 2021).

The objective of this study was to explore teachers lived experience of wellbeing in order to inform the discourse on enhancing wellbeing.

Materials and Methods. A qualitative case study, through semi-structured interviews with twenty-six newly qualified and experienced teachers in two schools, a disadvantaged (DEIS) and non-DEIS school.

Results. Taking an ecological, relational-cultural perspective, (Bronfenbrenner, 1979; Jordan 2006, 2017) this study reveals that at the micro level of professional wellbeing, the teacher-student relationship is at the core of being a teacher and is buttressed by a number of wellbeing constructs including; identity, self-efficacy and a range of emotional and social competencies. Furthermore, spanning the micro, meso and exo ecologies of context, mutually empowering relationships with colleagues, parents, leaders and peers underpinned by a culture of collaboration and a connection to place was found to buffer the impact of macro level external and cultural demands. This suggests that enhancing teacher wellbeing is not solely dependent on the individual's capacity to access resources to 'bounce back' in the face of challenge. Rather enhancing teacher wellbeing appears to reside in exploring the lived reality unique to each school context and culture and in the collective capacity of nurturing mutual relationships to navigate this complex ecological terrain.

Conclusions. The implications of the study suggest that employing an integrated ecological, relational-cultural lens at whole-school level to commence an open and active discourse on the meaning of wellbeing is critical. The voice of the teacher is pivotal and must be foregrounded in the process.

THE RELATIONSHIP OF RELIGIOUS/SPIRITUAL STRUGGLE AND RELIGIOSITY TO PSYCHOLOGICAL WELL-BEING UNDER UNCERTAINTY IN A SAMPLE OF LATVIAN CHRISTIANS

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Keywords. Religiosity Struggle; Religiosity; Psychological well-being

Objectives. Recent research has suggested that religion might be a source of comfort and strength in times of crisis brought about by uncertainty, but it may also be a form of stress if religious/spiritual struggles (RS) are experienced. Religiosity is linked to a psychological well-being (PWB) and according to research, religious centrality (RC) is negatively correlated with religious struggle. R/S comprises Divine, demonic, interpersonal, moral, ultimate meaning, doubt dimensions. RC comprises intellectual, ideology, public practice, private practice, religious experience dimensions. Each of these dimensions has its own impact and has its own weight to PWB. The aim of this study is to explore the relation between PWB with religiosity, and RS, and to find out which aspects of religiosity and RS most accurately predict PWB in conditions of uncertainty in a sample of Latvian Christians.

Materials and Methods. The study involved 452 participants aged between 18 and 85 ($M = 47.92$; $SD = 13.21$; 27.4% male). The indicators for religiosity were assessed by Centrality of Religiosity Scale CRS-5 (Huber, 2012), dimensions for RS were assessed by the Religious and Spiritual Struggle (RSS) Scale (Exline, 2014), while PWB was evaluated by Scale of Psychological Well-Being (PWB) (Ryff, 1989), and survey was disseminated using a convenience sampling.

Results. The results indicate statistically significant and very weak negative correlation between RC and RS ($R_s = -0.10$, $p < 0.05$), statistically significant and moderate negative correlation between RS and PWB ($R_s = -0.45$, $p < 0.01$), and significant and weak positive correlation between RC and PWB ($R_s = 0.22$, $p < 0.01$). Results of multiple regression analyses (step wise) model explains 34% PWB ($R^2 = 0.34$, $F(3.448) = 77.66$, $p < 0.005$), where 3 independent variables were meaning struggle ($\beta = 0.42$), moral struggle ($\beta = 0.17$), and religious experience dimension ($\beta = 0.15$).

Conclusions. It can be concluded that in a context of uncertainty PWB might be facilitated by religious support, strengthening religious experience, and preventing religious struggle.

PREVALENCE OF CHILDHOOD SEXUAL ABUSE AND ITS IMPACT ON MENTAL HEALTH AMONG INTERNATIONAL FEMALE UNIVERSITY STUDENTS IN LATVIA

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Keywords. Childhood sexual abuse; Sexual health; Mental health; Women; Trauma; Depression; Anxiety; University students; Latvia

Objectives. Childhood sexual abuse (CSA) can have a significant impact on the sexual health of adult women, causing both physical and psychological harm like trauma, depression, and anxiety. This study aimed to find the prevalence of CSA and its correlation with mental health disorders among international female university students in Latvia.

Materials and Methods. A cross-sectional study from September to November 2022 was carried out using an online survey. Modified versions of validated questionnaires, including questions about the specific types of abuse experienced, the frequency and duration of the abuse, and any physical or emotional consequences that have persisted into adulthood, were used.

Results. The study included 137 female participants with a mean age of 22 years, predominantly ethnically white, studying at Rīga Stradiņš University in Latvia. Among those, 24% had experienced childhood sexual abuse. The majority reported that the perpetrator was someone they knew (61%) and that the abuse started during adolescence (69%). Anxiety was found to be the most frequent mental health issue in both the CSA and non-CSA groups, with 42% and 52% prevalence, respectively. With 30% in the CSA group and 29% in the non-CSA group, depression was similarly frequent in both groups. The only disorder that was exclusively greater in the CSA group was post-traumatic stress disorder (PTSD), which impacted 24% of the CSA group and only 11% of the non-CSA group. No mental health implications were reported by 18% and 40% in the CSA and non-CSA groups, respectively.

Conclusions. A significant share of female international university students in Latvia have experienced childhood sexual abuse. It is associated with greater overall mental health disorder prevalence and PTSD prevalence. It is important for survivors to seek support and treatment to address these issues and improve their mental health.

LONELINESS PREDICTS DEPRESSION SCORES IN ADULTS AGED 20–44

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Keywords. Loneliness; Depression scores; PHQ-9; UCLA; Adults

Objectives. Loneliness is a risk factor for depression and is often associated with early mortality. In Latvia, the highest rate of depression is among adults and citizens report to feel lonelier than on average in Europe. The aim of the pilot study was to investigate whether there is a relationship between loneliness and depression indicators in Latvian adults aged 20 to 44 years.

Materials and Methods. The pilot study used convenience sampling and data were obtained with a digital survey publicly accessible on Facebook. The sample size was 130 respondents aged 20 to 44 ($M = 28$, $SD = 6.157$), of whom 32.3% ($N = 42$) were men. The survey consisted of sociodemographic questions and two tests: the Patient Health Questionnaire – 9 to measure participants' depression scores and the 'UCLA Loneliness Scale Version 3' to measure feelings of loneliness.

Results. There was a moderately strong relationship between depression scores and loneliness ($r_s = 0.495$, $p < 0.01$). Simple regression was used to determine whether loneliness scores would predict depression scores. The resulting regression model is statistically significant $F(38.221) = 0.224$, $p < 0.01$. Spearman's rank correlation coefficient was used to examine whether there was a relationship between loneliness scores and any of the depression scale items individually. A statistically significant close correlation was found between the loss of interest and joy in life and the feeling of loneliness ($r_s = 0.501$, $p < 0.01$).

Conclusions. The results of the pilot study show that those adults who feel lonelier are prone to a high loss of interest and joy in life, as well as the risk of depression. Public psychoeducation would be valuable to prevent the increase in loneliness and depression rates.

ADAPTATION OF THE COGNITIVE REFLECTION TEST 7-ITEM VERSION IN LATVIAN

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Keywords. Cognitive reflection; Cognitive Reflection test; Rational thinking; Cognitive ability; Thinking dispositions; Adaptation

Objectives. The Cognitive Reflection test is designed to measure the tendency to override an incorrect intuitive response and instead use reflection that results in a correct response. It is a prime measure of the limited information processing suggested by most dual process theories. While there are several versions of this test available in English, there is a lack of tests in Latvian. The aim of the study was to adapt the Latvian version of the Cognitive Reflection test 7-item version and test the convergent validity and reliability indicators of this version.

Materials and Methods. Data were collected from 107 respondents aged 18–50 years ($M = 24.37$; $SD = 6.24$; 29% male). The test for adaptation was *Cognitive Reflection test 7-item version* (CRT7; Toplak et al., 2014), which includes the three original *Cognitive Reflection test* (Frederick, 2005) items. *Belief bias in syllogistic reasoning* (Markovits & Nantel, 1989) was used to test criterion validity. Both tests were disseminated using a convenience sampling.

Results. The results indicated a substantial reliability (.81) for the Latvian version. The reaction and discrimination indices were all in the acceptable range. The seven items showed a significant very strong correlation with the three-item version ($r = 0.87$, $p < 0.01$), while the relationship with rational thinking task was significant and weak ($r = 0.38$, $p < 0.01$).

Conclusions. The reliability and convergent validity results of the test were good and consistent with those of the original version. Further studies should be conducted to test for test-retest reliability and factorial validity.

ADAPTATION OF THE LATVIAN VERSION OF THE BIG THREE PERFECTIONISM SCALE

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Keywords. Big3; Rigid perfectionism; Self-critical perfectionism; Narcissistic perfectionism; Reliability; Validity

Objectives. Recently several studies have reported on increasing perfectionism among young adults (Stornae, et al. 2019; Flett & Hewitt, 2020). Perfectionism is associated with various mental health issues and personality disorders (Ayearst et al, 2012). In order to carry out accurate research in the field, several measurements of perfectionism have been developed. One of them is the BIG3 Perfectionism scale (Smith, 2016). The aim of the study was to adapt the “Big Three Perfectionism Scale” to Latvian culture.

Materials and Methods. 173 participants aged 18–73 (M = 35; SD = 13.7) took part in the study, 118 women (68%). The BIG3 Perfectionism scale Latvian version was used in the study.

Results. The results show that the response indices of all items fall within the optimal range (1.80 to 4.20) showing indices from 1.90 to 3.54. Discrimination indices ranged from 0.20 to 0.80. The obtained Cronbach’s alpha coefficients for all scales indicate high internal consistency: For three major factors: rigid perfectionism $\alpha = 0.83$, self-critical perfectionism $\alpha = 0.79$, narcissistic perfectionism $\alpha = 0.73$. For subscales, it ranges from $\alpha = 0.71$ to $\alpha = 0.87$.

Conclusions. The performed analysis shows that the psychometric indicators meet the psychometric criteria of a good questionnaire (Raščevska, 2005). It indicates an adequate translation of the original questionnaire scales into Latvian, thus eliminating threats to the validity of the questionnaire scales on the item level (Smith, 2016). Although, Cronbach’s alpha scores indicate the high internal consistency of all questionnaire scales and sub-scales. It can be concluded that the Latvian version of the BIG3 may be considered a reliable and valid tool for measuring perfectionism, which is suitable for the cultural environment of Latvia.

ADAPTATION OF THE REVISED VERSION OF THE KENNY MUSIC PERFORMANCE ANXIETY INVENTORY (K-MPAI-R) INTO LATVIAN LANGUAGE

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Keywords. Music performance anxiety; Kenny music performance anxiety inventory; MPA; K-MPAI-R; Test adaptation

Objectives. Music performance anxiety among musicians is one of the most common and frequently described disorders (Dias et al., 2022). The aim of this study was to adapt the revised version of the Kenny music performance anxiety inventory into Latvian, including examining its psychometric properties and gender differences.

Materials and Methods. A sample of 568 Latvian musicians in the age range 18 to 68 years ($M = 29.5$; $SD = 10.91$), 80% females. Participants filled demographic questionnaire (gender, age, musical education, etc.), and revised Kenny's music performance anxiety inventory, translated into Latvian. The scale consisted of 40 items, each rated using 7 point Likert scale from 0 to 6, with higher total scores reflecting greater music performance anxiety.

Results. The internal consistency of the revised Kenny music performance anxiety inventory into Latvian was high and within the suggested norms ($\alpha = 0.92$). The results show that all of the response indexes are within the optimal limits, varying from 1.45 to 4.45. Overall in the inventory, all of the items except items 2, 9, 33, and 35 reached the item-discrimination index range of 0.2 to 0.8, however, when calculating within each subscale, all of the items were in the required range. The results showed that between the females ($M = 116.13$; $SD = 39.06$) and males ($M = 101.1$; $SD = 35.90$), there was a statistically significant difference in music performance anxiety scores, $M = 15.03$, 95% CI [7.09, 22.97], $t(566) = 3.71$, $p < 0.001$, with females showing higher music performance anxiety.

Conclusions. The results of this study indicate that the Latvian version of the revised Kenny music performance anxiety inventory has high internal consistency and the response indexes are within optimal limits. Additionally, the results show that females have higher music performance anxiety, which is in line with previous findings.

THE EFFECT OF HIPPOCAMPAL SUBSTRUCTURES- CA1, CA3, CA4 ON WORKING MEMORY IN PEOPLE AGED 65-85 YEARS

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Keywords. Hippocampus; Substructures of the hippocampus; Working memory; Aging

Objectives. With aging neurobiological changes in hippocampus are often present, e.g. they can be found in gene expression, synaptic plasticity, neurogenesis, hippocampal volume reduction, intracellular transport disorders etc. This study aims to investigate the relationship between hippocampal substructures volume reduction and working memory impairment in elderly people.

Materials and Methods. 58 participants without diagnosis of dementia were included in the study (Mean = 72.19, SD = 5.02, 20.7% male). Structural measures of hippocampus were obtained using Siemens 1.5 Tesla Avanto MRI scanner and volumetric data were extracted using Freesurfer 7.2. software. Working memory was assessed using Numbers Reversed test (Woodcock et al., 2001).

Results. Statistically significant positive correlations were found between working memory and the volume of the right hemisphere hippocampal CA3 head ($r_s = 0.56$, $p < 0.05$) and the left hemisphere hippocampal CA1 body ($r_s = 0.341$, $p < 0.05$). When controlling for the estimated intracranial volume, the CA4 head volume explained 43% of the working memory performance.

Conclusions. The results indicate that specific hippocampal segments could be associated with working memory performance. Further studies in larger samples should be conducted and special attention should be paid to CA3 and CA4 regions.

DEVELOPMENT OF THE MODIFIED STERNBERG TASK – A DIGITAL TOOL FOR WORKING MEMORY ASSESSMENT: A PILOT STUDY

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Keywords. Sternberg's task; Working memory; Reaction time; Digital tool; Test adaptation

Objectives. Latvia's scientific field lacks digital psychology tests to measure working memory. The aim of the study was to adapt and develop a modified digital version of the "Sternberg's Task" and to test its psychometric properties.

Materials and Methods. The test is a modified version of one of the most widely used working memory tests in neuropsychology – The Sternberg Task. The test measures working memory based on reaction times. The study sample consisted of 80 respondents, aged 21–61 ($M = 37.44$, women 51%). The test consisted of 6 test trials and 60 trials. In addition, sociodemographic data (age, gender, education) were obtained.

Results. The internal consistency, using reaction time results, was high and within the suggested norms ($\alpha = 0.975$). The discrimination indices (CITC) based on reaction time results ranged from 0.25 to 0.77, with an average value of 0.61. 1 test trial had a discrimination index below 0.3. The difficulty indices of the proportion of correct responses for the trials ranged from 0.01 to 1, with an average value of 0.93.

Conclusions. The modified Sternberg Task shows good internal consistency, but some of the trials may not be effective in discriminating between high and low performers. Therefore, it would be recommended to review and modify those trials that were identified as having low discrimination indices, in order to improve the overall performance of the test.

THE PSYCHOLOGICAL BENEFITS OF MULTIPLE LANGUAGE USE: EXPLORING THE DIFFERENCES BETWEEN MONOLINGUALS, BILINGUALS, AND MULTILINGUALS

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Keywords. Bilingualism; Multilingualism; Cognition; Emotional attentional control; Cognitive fusion; Subjective happiness, Trait anxiety

Objectives. Practicing competing language systems has been found to have a positive influence on psychological flexibility and cognitive control mechanisms. This study examined how cognitive advantages associated with language learning interact with bilinguals and multilinguals perception of happiness, trait anxiety, cognitive fusion, and emotional attentional control compared to monolinguals.

Materials and Methods. The participants completed a demographic questionnaire, a 14-item Emotional Attentional Control Scale (Barry et al., 2013), a 7-item Cognitive Fusion Questionnaire (Gillanders et al., 2014), 4-item Subjective Happiness Scale (Lyubomirsky, & Lepper, 1997), and a 20-item Trait Anxiety Inventory (Spielberger et al., 1977). The data were analyzed in SPSS.

Results. Independent-samples t-test did not reveal significant results; however, some trends aligned with the hypotheses. Results revealed that bilinguals reported better emotional attentional control ($M = 25.83$, $SD = 9.56$) than monolinguals ($M = 27.67$, $SD = 5.86$), $t(89.83) = -1.15$, $p = 0.255$. The number of years spoken in the third language positively correlated with emotional attentional control ($r(44) = 0.31$, $p = 0.039$), however negatively correlated with cognitive fusion $r(44) = -0.30$, $p = 0.045$, and trait anxiety, $r(44) = -0.37$, $p = 0.013$. The frequency of use of the third language positively correlated with subjective happiness, $r(45) = 0.44$, $p = 0.002$.

Conclusions. The present study revealed that when multilingual individuals use a third language more often, they perceive themselves as happier. In addition, individuals with a longer duration of multilingual experience may have better emotional attentional control and experience less trait anxiety, accompanied with lower levels of cognitive fusion. Results suggest that learning languages in early childhood has more pronounced influence on cognitive development. Besides, multilinguals may have a greater advantage at psychological flexibility and cognitive control.

SOCIAL WELFARE

CHANGES IN THE APPROACH OF SOCIAL WORK WITH YOUNG PEOPLE IN OUT-OF-FAMILY CARE IN RIGA

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Objectives. In November 2019, changes took place in social work with the young people in the transition from out-of-home care to independent living in Riga – a centralized work organization; the social workers make early contact with the young person before the end of out-of-home care; group work e.o. The Youth Support Center (YSC), a unit of the Children and Youth Center of Riga Municipality (CYCRM), was established. The aim of the study: to find out the impact of YSC activity on changes in the social functioning of young people. Study time: May, 2022 till November, 2022.

Materials and Methods. Mixed research methodology: statistical data analysis to analyze the social functioning of the target group youth (frequency, Spearman correlation and multi-factorial regression analysis); in-depth interviews with the social workers and administration; a survey of the clients as well as life story interviews and focus group discussion to assess the needs of the target group.

Results. YSC is the place where young people get the individual attention and support they need, especially in critical moments. By providing support only in relation to residence/welfare, the young person is also provided with security, not least the psychological and practical support. Social workers of the YSC are able to act in extraordinary situations, be flexible and empathetic.

Conclusions. The YSC is an essential and important resource providing support for all young people after out-of-home care, regardless of the form of care. The YSC increases the social functioning of young people, has a positive influence upon their values, their life in general, and the opportunity to become active members of the community and society. Positive change dynamics in the behavior of the target group youth prove that initiated changes in the approach of social work with young people in out-of-family care in Riga have produced positive results.

CHILDREN PARTICIPATION IN CASE MANAGEMENT PROCESS

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Objectives. Convention on the Rights of the Child defines the right of children to participate – to express their views and to take part in the decisions that concern and affect them. In Lithuania numerous legal acts enforce the right of participation, but in practice the implementation of child's right to participate is not sufficiently ensured (Report of Ombudsperson of Child's Rights, 2019, 2020). It is especially observed during case management process which is the main method of assistance to the children and their families since 2018.

The aim of the presentation is to analyse practitioners' experience in ensuring child's participation during case management process.

Materials and Methods. Qualitative research using semi structured interview method as data collection technique was implemented. The study involved 15 case managers and social workers, who were selected by non-probability purposive sampling. The data was analysed using qualitative content analysis by applying theoretical coding, constructing categories and sub-categories. The study followed basic ethical principles of the research.

Results. The analysis of the data showed that professionals' decision to involve a child in case management process depends on individual family's situation. Children are poorly involved due to preconceptions and lack of tools and knowledge on how to build relations with a child. Practitioners tend to pass on the responsibility of involving a child to each other, not taking personal professional responsibility.

Conclusions. Research participants consider the involvement of child to be an important and integral factor in the process of helping family, but in practice they give priority to involvement of parents but not children.

CURRENT LIMITS OF ROBOTICS AND ARTIFICIAL INTELLIGENCE IN SOCIAL WORK

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Objectives. In 2017, Oxford researchers Frey and Osborne published their well-known study, which predicts how susceptible jobs are to being replaced by computers. For social work, the prognosis looked optimistic: medical social workers and mental health and substance abuse social workers had only a 0.3% probability of being replaced by machines, and child, family, and school social workers had a 3% probability. At the end of that decade, it was accepted that mainly blue-collar and routine jobs would be replaced by machines, while professionals in human well-being and creativity would be needed in greater numbers. The penetration of technologies used by social workers, which began with the invention of the telephone, accelerated during the COVID-19 pandemic. Service users are served by chatbots and social robots. These tools aid in social work but reduce the need for a qualified social worker's presence. New tools like ChatGPT or Midjourney, which are at the beginning of an exponential trajectory of their development, have changed the way digitization is viewed; programmers of simple codes, people working with foreign languages, or copywriters are likely to lose their jobs. Will technologies be aids and supplements to services, or can they replace the social worker? The aim of the paper is to analyze whether robotics and artificial intelligence will reduce the number of social workers on the labor market. The methods used are the analysis of literature and statistics, forecasts, and predictions.

DIGITAL PERSPECTIVES OF ROAD SAFETY IN EUROPE AND UKRAINE IN PARTICULAR

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Objectives. The **objective** of the research is to consider the prospects of digitization of road safety, in particular, increasing its level through the construction of smart roads, of both some European countries and Ukraine.

Materials and Methods. The theoretical basis of the research is specialized literature on the traffic safe. The methodological basis for the research conducting on the empirical level is statistical analysis of the official statistic data of WHO and the Prosecutor General's Office of Ukraine.

Results. The key technologies behind smart cities are connectivity, cloud computing, data analytics, sensors, Internet of Things and artificial intelligence. The three commonly used cases highlighted by many countries are: (1) transport, (2) health, and (3) living (Chai K. Toh et al., 2020).

The causes of accidents can be grouped by the source of danger in the triangle «person – mechanism – road». Innovations are the driving force of development aimed at achieving acceptable (preferably zero) rates of death and serious injuries from road accidents.

According to the WHO's data Ukraine ranks 3rd after Bosnia and Herzegovina and the Republic of Albania in the rate «Road Traffic Accidents». According to Prosecutor General's Office of Ukraine during 2022, 6.366 criminal offenses were registered under Art. 286 of the Criminal code of Ukraine («Violation of rules of safety of traffic or operation of transport by persons driving vehicles»), which is 20% less than in 2021.

One of the solutions for improving road safety is the digitalization of road infrastructure. The main means of such digitization are: 1) use of sensor platforms that measure types of activity on the streets; 2) video analysis of traffic safety in automatic mode.

Conclusions. Increasing road safety in Europe and Ukraine is possible by strengthening such an element of the “person- mechanism-road” triangle as the road through digitalization of the road infrastructure.

DIGITALISATION IN PROVISION OF SOCIAL SERVICES – RURAL COUNTIES PERSPECTIVE

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Objectives. Digitisation is a reorganisation of various areas of social life using the infrastructure of digital communication and media technologies. *European Interoperability Framework – Implementation Strategy* (EIF) provides 12 principles, including a user-centred principle and the principle of inclusion and accessibility. They are also included in the Digital Transformation Guidelines of Latvia for 2021–2027. User-centricity means putting users' needs at the centre. Users of social work are both clients of social workers and service providers themselves.

Aim: to find out the readiness, understanding and attitude of social service providers towards digitalisation in the social field and the functioning of a user-oriented principle in municipal social services.

Materials and Methods. Partly structured interviews, survey of social workers.

Results. After the administrative-territorial reform, digital solutions to access social services are particularly increasing in rural regions. E-signature cases are introduced: e-decisions, e-contracts, e-addresses, and other e-services, as well as unified customer service centres for all types of services are created. However, a multi-numerical target group is clients 60 + and persons with mental disabilities who are not skilled users of technological tools.

Conclusions.

1. There are differences between regions in the digitisation of social services.
2. For persons aged 60+ and those with mental disorders, social workers are and will be required as face- to-face advisors in the future.
3. The role of the educator in day-to-day work of social and Library staff is increasing, supporting integration of vulnerable people into the digital system.
4. So far, social services providers have not systematically collected and evaluated the feedback from recipients of services – customers on the introduction of remote communication in the provision of social services.
5. Social workers are concerned about how not to lose the values of their professional social work in the remote communication system created by digitisation.

DOMESTIC VIOLENCE AND SOCIAL SERVICES IN LATVIA, LITHUANIA, SLOVAKIA AND NIGERIA: COMPARATIVE STUDY

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Objectives. With regard to neglect, deprivation, false allegations, exposure to traumatic experiences, and other factors, it is reasonable to claim that domestic violence is a major contributor to child abuse in families. Domestic violence also affects the national economy and the probability of poverty. The legal definition of violence and cultural traditions play a significant role in how it is perceived. This study focuses on exploring domestic violence and social services to respond to domestic violence in families with children and examines multidisciplinary approach to domestic violence in families across Latvia, Lithuania, Slovakia and Nigeria.

Materials and Methods. Based on purposive sampling, 16 in-depth interviews were conducted with professionals from Lithuania, Latvia, Slovakia, and Nigeria who work with families and individuals who have experienced domestic violence. The data were analysed using ATLAS.ti 5.0 to generate themes and finalised by employing qualitative comparative analysis (QCA) with the software fsQCA 4.0.

Results. Data show that several conditions impact the effective intervention and prevention of domestic violence: tradition for tolerance of violence, lack of or fuzzy national definition of domestic violence, cultural traditions, level of support for women's empowerment, government policies addressing family violence, and multidisciplinary efforts of social intervention professionals. Four of these conditions were sufficient causal pathways for domestic violence.

Conclusions.

1. The observed level of violence tolerance provides some explanation for the low rate of self-reported domestic violence and rationale for a greater emphasis on human rights and dignity awareness.
2. The multidisciplinary efforts of social intervention are evident in the services provided in Lithuania, Latvia, Slovakia, and Nigeria; there are professional referrals to little multidisciplinary collaboration in Nigeria.
3. The example of Nigeria demonstrates that regulations exist to prevent domestic violence, but cultural traditions make it difficult for women to disclose abuse, resulting in many women suffering in silence.

FINANCIAL AND NON-FINANCIAL INTRA-FAMILY SUPPORT FOR OLD-AGE PENSIONERS IN THE BALTIC STATES

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Objectives. The objective of the study was to examine the patterns of intra-family support for old-age pensioners in Latvia, Estonia and Lithuania, and their socio-demographic determinants.

Materials and Methods. The study is based on the SHARE Wave 8 survey data. Only the retired respondents of three Baltic States have been selected for the analysis (n = 3394). Questions examined whether older people received and/or gave financial gifts and provided (or were provided with) help from people outside their household. Crude and multivariable binary logistic regression models were used to test for the contribution of different socio-economic factors (gender, age, parenthood status, living single or in couple, and financial situation of respondents) to the probability of giving/receiving support, as well as reciprocity in providing such support. Data were analysed using SPSS v. 27 software package.

Results. The respondents more often receive help (27.7%) than they give it to others (12.5%), however, they more often give financial gifts (16.2%) than receive them (10.5%). The overwhelming majority of pensioners can cope on their own without any significant support from their separate living relatives. Respondents in Latvia are considerably less active in participation in the support transactions (both receiving and giving, both financial and non-financial) compared to Lithuania and, especially, to Estonia. While reciprocity is the most important factor in financial support transactions, and age in non-financial transactions.

Conclusions. The so-called “fourth pension pillar” (income sources in old age other than formal pension systems) functions differently in different countries, even in countries as close economically and culturally as the three Baltic States. This study contributes to a better understanding of its regularities which is needed to better organise the social assistance and social work system.

INDEPENDENT LIFE SKILLS OF YOUTH AFTER INSTITUTIONAL CARE: COMPARATIVE STUDY

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Objectives. The objective of the research is to research the problems young people face after leaving institutional care and starting independent life and find out whether improvement of youth independent life skills is observed.

Materials and Methods. Survey methodology and expert interviews method are employed to reach the research objective. The data were compared to the expert interview results ten years ago (2011–12).

Pilot survey (n = 60) investigated the understanding of independent life, and the main problems young people face after leaving institutional care, and what independent life skills youth need to develop.

Expert interviews (n = 6) with social workers helped to better understanding of organisation of youth support organisation in order to improve independent life skills and quality of life of youth, types of assistance to young people after institutional care, and ways, how the independent life skills could be improved.

Results. The survey data demonstrate different understanding of independent life – starting from independence from adults to independent decision making and financial independence from anybody. Around 60% of respondents think that they have enough skills to independent life, 20% have limited skills of independent life. 10% do not know how to live independently.

In accordance to the pilot survey data, young people lack the following life skills – cooking, laundering, paying bills, shopping.

Data from the expert interviews show that readiness to independent life is closely related to the training that was provided at the institution and the support system young people receive after institutional care.

Conclusions. Both survey data and expert interviews demonstrate the progress of independent life skills among young people leaving institutional care. Training independent life skills during institutional care, the work by the youth support centres, and other policy measures introduced in Latvia have helped youth to obtain independent life skills. However, training of some practical life skills needs to be improved.

INDIVIDUAL BUDGET MODEL FOR COMMUNITY BASED SOCIAL SERVICES FOR ADULTS WITH MENTAL DISABILITIES IN LATVIA: PILOT PROJECT RESULTS.

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Objectives. To test appropriateness of the IBM model as a new model of financing CBS for persons with mental disabilities and to estimate effectiveness of the model in addressing individual social and health care needs of persons with mental disabilities.

Materials and Methods. A total of 103 persons with mental disabilities participated in the IBM pilot project for 19 months period. Individual needs of each participant were identified by social care professionals, using needs assessment standard tool and applying person-centered techniques in close cooperation with person's natural support circle. Effectiveness was estimated for outcomes. Subjective life quality assessment tool, (*Gigantesco* and *Giuliani*, 2011) was used to assess improvement in outcomes

Results. Based on the results of individual needs assessment 306 goals were indicated: 137 goals in the field of personal care and specialist support, 108 goals in support for employment and 61 goals for leisure time activities. In total 109 (36%) goals were achieved fully, 180 (59%) were achieved partly and 17 (5%) were not achieved. Participants reported positive changes in 9 of 13 dimensions of QOL measures, whereas 85% of participants reported positive changes in the dimension "Change of overall quality of life", 71% of participants reported positive changes in the dimension "Overall psychological health" and 63% of participants recognized positive changes in the dimension "Ability to cope with work and educational tasks".

Conclusions. The results of the pilot project demonstrate IBM as effective tool for providing individual person-centered support to persons with mental disabilities ensuring achievement of the personal development goals leading to positive change in self-determination and quality of life.

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INTERGENERATIONAL SOLIDARITY IN FAMILY: INFLUENCE OF THE EDUCATION LEVEL ON FREQUENCY OF CONTACTS

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Objectives. The aim of this study was to examine relation of the education level of an adult child and education level of a parent with the frequency of contacts between the child and the parent. A factor of time spent travelling to a parent's home was also examined as a way of promoting frequency of contacts.

Materials and Methods. The sampling consists of 332 Latvian citizens aged from 18 to 62 who met the research selection criterion: Inhabitants of Latvia with at least one living parent and who do not live in the same household with their parent. Data were collected by using a web survey method from June 2019 until January 2020. Results were analysed by using a non-parametric analysis method, descriptive statistics, and Spearman's correlation test.

Results. 1. Results showed that there is a correlation, though weakly expressed ($r_s = -0.174$, $p < 0.001$), between the frequency of personal meetings between an adult child and the education level of their parent; personal meetings are more frequent with a parent who has acquired a higher education. 2. A correlation has been determined between the use of information technologies and the education level of a parent ($r_s = -0.228$, $p < 0.001$); adult children more often use information technologies to contact their parents who have obtained higher education. 3. Contacts between adult children and parents by phone are related to the distance from the child to the parent's home.

Conclusions.

1. Frequency of the use of information technologies for communication is related to the education level of the child and their parent; the higher education of the parent, the more often children use information technologies for communication.
2. Frequency of personal contacts and use of phone between is related to the time spent to travel to the parent's home; children who live closer meet parents more often and call them more often.

MEDIATION AS A SOCIAL WORK METHOD IN FAMILY CONFLICT RESOLUTION

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Objectives. The objectives of the research is to study the understanding of mediation as a method of social work, its practical application in resolving family conflicts in social work with families and children

Materials and Methods. Summarizing the experience of other countries, the author has created a questionnaire. In order to find out the most frequently used skills and attitudes used by social work specialists in working with families and children to resolve conflict situations, 70 social workers working with families and children were interviewed. In order to explore deeper the understanding of mediation as a method of social work, the practical application and limitations of its principles and steps, using mediation as a method of social work or elements of mediation in work with families and children, six semi-structured interviews were conducted with social workers

Results. The obtained results show that the application of mediation skills and attitudes is part of the daily work practice of social work in resolving conflict situations. Most often, social workers use general psychosocial counseling skills in solving conflict situations, which are aimed at building successful communication and relationships, as well as providing support. On the other hand, skills that are specifically used in the mediation process in recognizing and managing complex conflict situations are used less often. However, it is difficult for social workers to find a way to help families in cases of heightened emotional tension and high levels of conflict.

Conclusions. The results shows that it is necessary to continue further research and professional discussions on the application and integration of mediation as a social work method in social work and the development of education and training to increase the competence of social workers to support and promote more effective practice and provide preventive and timely assistance to conflicting families.

OLDER ADULTS DIGITAL INCLUSION – NEW CHALLENGES FOR LITHUANIAN SOCIAL POLICY

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Objectives. The European Commission has shown significant leadership in encouraging all countries to plan for the changing age demographics throughout the EU, by sharing good practices, developing related policies and legislation and encouraging members to address basic human rights requirements by providing adequate access to affordable quality care (Long term care in Europe, 2017). Lithuania as most of EU countries has an aging population. At the beginning of 2019, there were 552.4 thousand elderly people (aged 65 and older), or 19.8 per cent of the total resident population. Each seventh man and each fourth woman were aged 65 and older (Official statistics portal, 2019).

Materials and Methods. The aim of the paper is to investigate possibilities of Lithuanian social policy to meet older adults' digital needs for better inclusion and active ageing. Paper is based on secondary data analysis including legal documents (EU and National Programmes, Strategies, Orders), scientific research (on national and international levels), statistical (of older adults' population) and other data (results of national research).

Results. A significant proportion of older adults lacks the skills to use digital technology, which are essential for successful functioning in society. The rapid development of technology and the recent COVID-19 pandemic have accelerated the transference of many services on the Internet. The importance of the use of technology for older adults was particularly evident during the COVID-19 pandemic. Various research revealed that the telephone, and less often the computer, had become the main working tool for a significant proportion of close care workers.

Conclusions. This situation points to a new need for the development of digitised social services and a new approach to social policy. Social policy should refocus, adopt new approaches and develop a new service model that is more effective for all groups in society, including older adults, especially in complex situations such as pandemics.

PECULIARITY OF SOCIAL WORK WITH YOUNG PEOPLE EXPERIENCING HOMELESSNESS

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Objectives. Homelessness is a concern for policymakers and society as a whole. However, youth homelessness is a more significant concern for individuals experiencing it. Social work with young homeless people requires understanding the concept, causes and consequences of homelessness, adequate skills, and the ability to use a holistic approach to tackle the problems. The purpose of this thesis was to highlight the experiences of social workers working with young homeless people, analyse the cause concept and consequences of youth homelessness, and identify ways to provide social assistance to young homeless people.

Materials and Methods. A qualitative research method was used in this thesis to examine the phenomenon of youth homelessness. Five social workers working with young homeless people from a city in Finland participated in this research. Data were collected with semi-structured interview questions. The semi-structured interview data were analysed manually in categories and subcategories using the content analysis method.

Results. The findings indicated that social work with young homeless people is complex and extensive. Becoming homeless at a young age may be a chaotic situation; many are in denial of the reality of the problem. Homelessness is understood differently from different countries. There is a shortage of affordable personalized housing for young homeless people. Social workers lack sufficient tools to provide adequate services to young homeless people; early identification is vital. Hidden homelessness is a challenge; there is the need to low threshold services to young people who are at risk to become homeless. Health and mental health undiagnosed is a problem; collaboration with other services is also a problem.

Conclusions. It will be beneficial to enhance services provided to young people experiencing homelessness to reduce homelessness among young people and facilitate the activities of social workers. It is recommended to give more tools to social workers working with homeless young people.

PREVALENCE OF SEXTING IN CHILDREN AND ADOLESCENTS IN SLOVAKIA IN THE PANDEMIC AND POST-PANDEMIC PERIOD (IN THE CONTEXT OF DEMOGRAPHIC CHARACTERISTICS)

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Objectives. The aim of the study is to identify the prevalence of sexting among children and adolescents in Slovakia in 2021 and 2022. The study population consisted of 1423 children and adolescents in 2021 and 1194 children and adolescents in 2022.

Materials and Methods. Sexting was measured with questions focusing on sending and receiving sexts, the items were taken from the EU Kids online study.

Results. The primary results of the analysis include the finding that there was a decrease in sexting in the post-pandemic year (2022) compared to the pandemic year (2021) at both the level of receiving and sending sexts. Compared to foreign countries, Slovak children and adolescents do not differ significantly in receiving sexts, but they do differ in sending sexts, which they do less. We also observed some differences with respect to gender, age, and family type.

Conclusions. The results showing the status of sexting among children and adolescents can serve as a basis for the development of prevention programmes at different levels of social prevention.

REALISATION OF CHILDREN'S RIGHT OF PARTICIPATION IN THE COMMUNITY CHILDREN'S CARE HOME: ANALYSIS OF CHILDREN'S EXPERIENCES

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Objectives. The objective of the study is to reveal the realities of the realisation of the children's right of participation in the community children's care home based on children's experience.

Materials and Methods. For the study, qualitative study was chosen while using a semi-structured interview method. 8 children living in the community children's care homes (henceforth referred as CCCH), which are located in different locations in Lithuania, participated in the study.

Results. The respect of employees for the right of the child of participation which is expressed through the openness of employees to the opinion of the child, the giving of an opportunity for the child to speak out his opinion, the listening to the opinion of the child, the discussion of the child with the adult and the adhering of the adult to the opinion of the child when taking decisions and the encouragement and support for the autonomy of children in everyday situations. The dominating position of the employee is expressed through the non-listening to the opinion of children, disagreement with the child, the devaluation of the opinion of the child, The lack of adhering to the opinion of the child and the overriding of the opinion of the child and the child's lack of trust towards himself and his own opinion.

Conclusions. The study revealed the realization expression of the child's right of participation and difficulties in realising it at CCCH. The realization expression of the children's right of participation at CCCH should be attributed to the respect of employees for the right of the child of participation and possibilities to realise child's right of participation in everyday situations. The study identified that the realisation difficulties of the children's right of participation at CCCH are attributable to the dominating position of the employee and the child's lack of trust towards himself and his own opinion.

REFLECTING ON BIOGRAPHY AS A FACTOR IN TEACHERS' SELF-DEVELOPMENT TOWARDS A WELFARE STATE

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Objectives. It is now widely recognised that the creation of a welfare state requires a sustained focus on one of the key drivers of educational change, schooling and, by extension, societal improvement: educators, who are expected to produce young people capable of participating actively and productively in change. The accessibility and quality of education services is one of the priorities highlighted in the Law on Education of the Republic of Lithuania (2022), its implementing acts, the State Education Strategy (2013–2022) and other legal acts. It is often not sufficiently clear why and which education systems are effective and therefore qualitatively better. Researchers note that the professional development of teachers should be seen as a lifelong process, which should be considered in its organisation. For without a well-developed education system that is accessible to all, there can be no welfare state.

Materials and Methods. The aim of article is to reveal the role of reflection on biography in the recognition of a person's lived vocation to become a teacher, in the development of competences and participating in the process of educational change.

Results. Research methodology. Qualitative research using narrative interviews. 14 participants took part in the study. The research instrument chosen was the biographical narrative interview.

Conclusions. The research revealed that the choice of the teaching profession and the perception of vocation are triggered by biographical circumstances. The pedagogical potency and childhood interests in certain activities, as well as the awareness of one's own needs, become the basis for the further development of abilities, skills. When an individual chooses a profession as a result of a vocation, it is as if there is a need for constant self-reflection on the part of the educator, which leads to the need for continuous development. By improving himself, the educator also actively contributes to the change of the education system.

REPRESENTATIVE RESEARCH ON SOURCES OF SAFETY IN SLOVAK CHILDREN

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Objectives. Various myths are presented about the modern family and family relationships. We have obtained an up-to-date picture of the state of the Slovak family in relation to children. The basic goal of the research was to find overview information about the sources of safety, fear and insecurity among the current Slovak population of children.

Materials and Methods. We carried out quantitative representative research. We collected research data from 13.10. until 28.11.2022. The research representative sample consisted of 1,296 7th-grade students (out of a total of 51,743 registered students as of September 15) obtained through quota selection: region, size of the village, type of school and gender. They represented shares in the entire population. We collected data through an electronic questionnaire in 65 primary schools in Slovakia directly in the classrooms with the participation of trained interviewers. The questionnaire contained 18 questions and recorded a total of 163 variables.

Results. It turned out that experiencing a sense of security and trust in the family has a significant relationship with overall satisfaction with life and experiencing positive emotions in children. These children live significantly less in the feeling of fear, threat and the need for significant changes in life. From the results of the research, it can be concluded that girls perceive threats more sensitively, which has been shown in several areas that threaten children: hunger, violence and bullying; drugs and alcohol; bad relations in the family.

Conclusions. It turned out that the more time children spend with their parents, the more positive their feelings, the more satisfied they are overall, and the more they trust their loved ones. The subject of the research was not a detailed assessment of the quality of the family environment, which leaves room for further investigation.

ROLE OF SOCIAL WORKERS IN THE PROVISION OF SERVICES FOR FAMILIES WITH CHILDREN AND YOUTH WITH DISABILITY IN LATVIA, SLOVAKIA AND PORTUGAL

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Objectives. There are many services available for families with children and youth with disability in Latvia and Slovakia. the interviews aimed at finding out the interdisciplinary collaboration in the provision of services for families with children and youth with disability.

-To find out services for families with children and youth with disability in Latvia, Slovakia, and Portugal

-To find out about interdisciplinary collaboration in the provision of services for families with children and youth with disability.

Materials and Methods. All European countries are well structured with social services with the development of the social professions. Different names have been used for the social work profession across Europe, such as “social pedagogue” in Spain and “animators” in France with the mutual aim of helping the clients and user groups (Lawrence 2013). Childcare services have been emphasized in Europe, with the engagement of different professions to work for the benefit of child welfare. “Preventative services” are also available in form of emotional, financial, and social, but lacking due to a shortage of finances when policies are under pressure as well as a lack of training in professionals (Webb, 2006).

10 Semi-structured interviews have been conducted with services providers which include social workers, special educators, counselors, physiotherapists, etc. all interviews have been done face-to-face with the consent to record for transcriptions purposes.

Results. Social workers perform many functions and play a vital role in the provision of services for families with children and youth with disability. their roles include accessing information about services, counseling, and motivating the families as their core values in the social work profession.

There is a lack of services such as rehabilitation, different therapies, kindergartens, and few options for inclusive education both in Latvia as well as in Slovakia due to mainly finance.

Conclusions. services have improved for families with children and youth with disability.

SKILLS CATALOGUE FOR JOINT INTERNATIONAL EDUCATION PROGRAMMES IN THE EUROPEAN EDUCATION AREA

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Objectives. EU and national policy planning documents encourage the development of international cooperation in the field of higher education, including the creation of joint study programmes or courses. Often, differences in the structure and content planning of study programmes are a significant limitation to achieving such results. Based on the skills monitoring system developed by RSU, the objective of the study is to analyse the potential use of an international skills catalogue in a common European Education Area.

Materials and Methods. To achieve the objective, the project “SkillTrack” was created with partners from Baskent University (Turkey), Arcada University of Applied Sciences (Finland), Protestant University of Applied Sciences Ludwigsburg (Germany), (01.2022-01.2024, Erasmus+funding No.2021-1-LV01-KA220-HED-000023077). As part of the project task, mapping of practical skills of the study programmes implemented by the partners (“Social work”, “Nursing”, “Occupational Therapy”, “Physiotherapy”) was carried out, and an electronic unified skills catalogue was created, as well as descriptions of the identified skills.

Results. For mapping process 517 social work, 740 nursing, 378 occupational therapy, and 298 physiotherapy skills were submitted. After mapping and two workshops, different and common skills were identified and 240 skills were included in the skills catalogue to develop a unified teaching and assessment methodology. The interim results of the project show that an unified electronic platform for skills descriptions provides a convenient and transparent skills registration for multiple partners.

Conclusions. The skills catalogue gives the opportunity to create a unified teaching and assessment methodology and provides support in planning the sequential acquisition of skills in joint programmes. At the same time, it was concluded that universities should look for individual technical solutions to connect the skills catalogue with local IT systems. The existing catalogue should be supplemented with descriptions of new skills, adding other study programmes and expanding the range of partners, promoting opportunities for cooperation in a common European Education Area.

SOCIAL WORK PERSPECTIVE IN LONG-TERM INTEGRATED CARE FOR ELDERLY PERSONS WITH CHRONIC DISEASES

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Objectives. The trends of population aging and the growth of chronic diseases among the elderly in European countries provoke health care and social sector providers to develop effective models of integrated care. Integrating health care and social services aims to move from hospital-based health care to more community-based long-term complex care for people with chronic diseases. Better coordination and integration of health care and social services is critical to improving the effectiveness and accessibility of these services for elderly people. However, implementing integrated care in practice can be difficult due to bureaucracy and unclear funding and legal regulation, different approaches that prevent health care professionals and social workers from finding common value positions, practice models that would connect their activities.

The objective of the article is to highlight the perspective of social work in integrated care

Materials and Methods. This paper is based on a combination of literature review and document analysis on field integrated care in the past 5 years.

Results. This literature review revealed relevant topics related to the roles of the social worker (client representation, mediation, advocacy, case management); crisis prevention and assistance to the elderly in a crisis; the benefits and challenges of the integration of social and health care services.

Conclusions. Representation and mediation of elderly people with chronic diseases is a perspective of social work practice that encompasses a wide range of activities and processes in contexts of integrated care. The relevance of social workers as advocates of the elderly arises when seriously ill, lonely people cannot independently make decisions about health care, financial situation, and family involvement. Case management includes individual and community dimensions of work with the client (family), client needs and manager's capabilities and competences, connection with social networks, as well as intersectoral and interprofessional cooperation, service planning and coordination.

SOCIAL WORKERS' EXPERIENCE WORKING WITH REFUGEES DURING COVID-19: CASE OF AUSTRIA

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Objectives. In this time of the global pandemic, emerged need for paying great attention to Refugees who were already ignored in a direct and indirect ways. On the other hand, professional activities of social workers were significantly influenced during COVID – 19 and made their job harder and more challenging than before. Research goal – To disclose Austrian social workers 'experience working with refugees during COVID-19.

Materials and Methods. Research strategy – qualitative research. Data collection method – Semi-structured interview (non-probability sampling, 8 social workers). Data analysis method – content analysis method. The study was conducted in the November – December of 2021 among social workers in Austria. Interviews have been done both face to face and online (due to the massive lock down in the country). The informants were chosen according to the following criteria: social workers with University degree; must have been working since the beginning of COVID-19; having professional experience of working in Austria with refugees more than 2 years.

Results. Research results – Impact of COVID-19 on refugees (social workers' perspective) were confusion, isolation, excessive vulnerability. Challenges of social workers during COVID-19 pandemics: significant alterations in routine social work and struggling to preserve clients. The restrictions imposed by the COVID-19 pandemic have made some of the activities of social workers with refugees remote. Social workers identified both negative and positive aspects of working remotely with refugees. Impact of COVID-19 on Refugees Children and Youth in an Educational Way – less opportunities due to lack of digital devices; the obligation to contribute to the family's financial support; drop-out from education system.

Conclusions. In times of crisis, socially vulnerable groups are most affected. Dealing with these groups requires special sensitivity and professionalism.

TRANSNATIONAL FAMILIES IN LATVIA

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Objectives. The objective of the study is to deepen knowledge and understanding about phenomenon and dynamics of transnational families in Latvia.

Materials and Methods. The main methods: desk research (28 sources from EU countries) and qualitative methods (pilot interviews with members of transnational families), n = 9. three groups of respondents were interviewed: migrant family members, left behind members and social services.

Results. Transnational families are different types of families who live apart in different countries, and who retain "a 'sense of collective welfare and unity,.. "familyhood,".. across national borders" (Bryceson and Vuorela 2002). The most prevalent transnational family types in Latvia are: families separated due to economic migration, forced migration, family member works abroad continuously, families dispersed after marriage or separation/divorce, families in which a young person lives abroad for studies. However, precise data are not available Transnational families generate large personal remittances. Statistics demonstrate that Latvia is highly dependent from inflows of personal remittances (214 m. Eur in 2019, 154 m. Eur in 2020).

In transnational families some family members are left behind: child/children, or/and spouse/partner, or/and grandparent/-s.

Interview data demonstrate that economic migration is not always related to better economic situation of left behind family members (in particular children, grandparents). About half of interviewed left behind family members report lack of social support, lack of emotional support for children and parents, missing close relationships between children and main caregivers, increasing problems at school and with remaining family members.

Conclusions. The desk research and interview analyses show new insights into transnational family perspective. The role of grandparents demands greater recognition in the areas of transnational care arrangements.

Data demonstrate the consequences of separation of children from parents, high burden of care taking for grandchildren needs to be taken into the work programme of social pedagogues and social workers.

VISUALISATION OF THE LIVED EXPERIENCES OF SOCIAL ORPHANS (LATVIAN EXPERIENCE)

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Objectives. Use and validation of a new method in the research of orphans.

Over the past twenty years some research on children in social care perpetuated negative stereotypes, stigmatization and marginalization of children who need to use social services. This contributes to negative outcomes of care graduates as they seek to create lives for themselves. Thus, they experience more difficulty gaining employment, housing, further education and acceptance in social clubs and other organizations. The overarching picture of the care leaver in Eastern Europe is often unreliable, a drain on the social welfare system and at times a criminal. They are seen as replicating the social cycles of their parents and grandparents.

Materials and Methods. A method of “photo voice” is used.

Constructing a study that offers young people an opportunity to be empowered to express their lived experiences and show who they truly are through a strengths-based modality (Wang & Burris, 1997) is the motivating force behind this research.

Results. Since some researchers have often used methods of research that make marginalized groups passive participants as opposed to active participants this research has sought to use the Photo Voice method which creates an environment where Participants are co-researchers because they take the photographs and interpret their meaning for the researchers. This differs fundamentally from traditional research where the power often lies solely with the researcher.

Conclusions. The knowledge from this research will contribute to a new understanding of care leavers in Latvia and Eastern Europe.

YOUNG PEOPLE GROWING UP IN SOCIAL CARE IN LATVIA

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Objectives. The overarching objective of this research was to explore the meaning of social orphanhood in Latvia. Additionally, to better understand the lived experiences of young people in both orphanages and foster care and to listen to the voices of young people who grew up in care.

Materials and Methods. The methods used for this investigation were qualitative using both face to face interviews and creative expression. Art materials were available as an option alongside interviews to express emotions and experiences through drawing and poetry. Reflexivity through member checking was completed. Ethics review was completed through the University of Dundee in Scotland and the study met all criteria for ethical and professional research.

Results. The results supported the need for deconstructing stereotypes and dominant assumptions about people growing up in care. Thus providing alternative narratives of self-reliance and resistance to adversity. Challenges and successes of both foster and orphanage care as well as the transition to independent living at 18 years of age was informed on. All participants had the capability to reflect and speak about their histories and current status as well as resilience factors.

Conclusions. A surprising preference for orphanage care over foster care offered insight into recommendations for practice and policy that may have the possibility of addressing challenges in foster care. This rich knowledge base can be used to support and inform the practice of children in the care system in Latvia and internationally.

NURSING AND MIDWIFERY

ATTITUDES AND MOTIVES FOR CONTINUING EDUCATION OF GRADUATE NURSES

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Objectives. The constantly growing needs for high quality health care, as well as the development of modern medical science and practice, put at the forefront the need for excellently trained nurses who continuously maintain, develop and improve their professional competence.

The purpose of this study was to explore the attitudes and motives for continuing education of graduate nurses.

Materials and Methods. In our report, we applied literature analysis, documentary method, sociological method and statistical method. The opinion of 65 nursing students graduating from Medical University of Varna was studied by means of a semi-structured interview. The study was conducted in November 2022. Graphical analysis was used to visualize the observed processes and phenomena. Microsoft Office was used to create the graphs.

Results. The majority of graduating nurses confirmed their positive attitudes towards continuing education. The majority of our survey participants said that they would like to increase their professional competence through specialization, as well as attending courses, seminars, participating in research-practice conferences, and conducting nursing research. A significant proportion of respondents expressed attitudes to furthering their education by completing a master's degree. The main motives for continuing nursing education of graduating nurses are the aspiration for continuous professional development and improvement, the desire to increase knowledge and skills, for career development and personal fulfilment.

Conclusions. The results prove that graduating nurses participating in our study are willing to continuously learn, motivated by the need to develop and improve professionally, to upgrade their professional competence, to grow in their career and to realize themselves as individuals. The data show that respondents are aware of the need and importance of continuous learning for nurses to develop as individuals and professionals and to provide quality health care.

EMOTIONAL INTELLIGENCE AND SELF-ESTEEM IN NURSING STUDENTS

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Objectives. The main objective of the conducted survey was to assess the relationship between emotional intelligence and self-esteem among nursing students at the Catholic University in Ružomberok, Slovakia.

Materials and Methods. A quantitative research method was used to collect data for the research part of the work, a self-constructed questionnaire, compiled with the inspiration of the determinants of emotional intelligence determined according to D. Goleman together with the Rosenberg scale.

Results. One of the ways in which emotions influence behavior is through motivation, which largely conditions it. We noted the confirmation of this theory, as more than 70% of respondents feel ambitious, persistent, proactive and optimistic. An important factor influencing the score of emotional intelligence and self-esteem of nursing students is previous education, which is represented by secondary health school / care assistant field in 79% of respondents. These students were measured to have higher emotional intelligence and self-esteem scores than 19% of high school graduates. The average value of emotional intelligence for all students reaches a score of 118 points, of which 57% of students achieve an average score and 41% of respondents passed with an above-average score. Out of a sample of 100 respondents, second to third year students performed best with an average score of 125 to 122 points.

Conclusions. The scope of knowledge about the correct interpretation of feelings and adequate feedback without succumbing to emotions discusses the basic attributes that define the emotional intelligence of a nurse. For this reason, it is necessary to draw attention to the careful consideration not only of the choice of studying a health field, such as nursing, but also of the subsequent choice of employment. It is necessary to purposefully apply the elements of emotional intelligence in practice.

NURSING WORKFORCE TURNOVER

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Objectives. The concept of employee turnover is an important indicator that is often central to workforce planning and strategies in organizations. The reasons why employees leave their current jobs, and not just the fact that they leave, has a major impact on future employee retention rates, employee job satisfaction and engagement, and an organization's ability to attract talented people to fill vacancies. The shortage of nurses is reported to be a growing problem worldwide, including in Europe. In Slovakia, according to data from the Slovak Chamber of Nurses and Midwives, 11,181 nurses have left the healthcare system over the past 10 years. During the same period, 3,882 graduates of the nursing study program entered the system. The Chamber has identified the shortage of nursing staff as the most serious problem facing nurses in their workplaces. The aim of the contribution is to point out the causes of fluctuation and the aspects of the labor market that can have a positive effect in addition to negative impacts. A worldwide problem in the field of health care is currently a shortage of nurses. Nursing turnover leads to increased recruitment and training costs, which is a waste of educational resources. Meanwhile, the workload, stress and burnout of the remaining nurses may indirectly increase, creating a vicious cycle.. Organizational measures need to be put in place to ensure and support the retention of nurses in healthcare. This is necessary to ensure continuity of quality patient care and services, organizational efficiency, performance and productivity.

RATES OF MORAL DISTRESS OF ANAESTHESIA AND INTENSIVE CARE NURSES IN DIFFERENT REGIONS OF LATVIA

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Objectives. Moral distress is a kind of pain or anger that affects the body, mind, and communication capacity and it is generated in reaction to situations, where an individual is aware of the existence of a moral problem. In health care, moral distress is defined as a phenomenon in which a nurse knows how to act ethically correctly in a certain situation, but feels powerless to perform this action ethically correctly.

The aim of the study was to investigate the indicators of moral distress in practising anesthesia and intensive care nurses working in different regions of Latvia.

Materials and Methods. The quantitative research method was used – questionnaire, research design – quantitative cross-sectional descriptive and correlation study. Measure of Moral Distress for Healthcare Professionals was used.

Results. The final sample of the study consisted of 184 respondents. The cohort consists of people between 20 and 69 years of age ($M = 42.99$; $SD = 12.24$), 97.8% were females. Distribution of respondents by region: Kurzeme – 14.7%, Latgale 7.1%, Riga region 54.9%, Vidzeme 13.6%, Zemgale 9.8%.

In the situation "Continue to provide aggressive treatment for a person who is most likely to die regardless of this treatment when no one will make a decision to withdraw it" the nurses of Kurzeme ($M = 1.93$) and Vidzeme ($M = 1.87$) region have been detected to have high moral distress indicators.

In the situation "Experience lack of administrative action or support for a problem that is compromising patient care.", it was concluded that the distress rates are higher in Vidzeme ($M = 2.14$), while they are lower in the Riga ($M = 0.98$) region.

In the situation "Work with team members who do not treat vulnerable or stigmatized patients with dignity and respect.", the indicators are high for the nurses working in the Riga region ($M = 1.72$).

Conclusions. Vidzeme region has the highest levels ($M = 2.17$) of distress compared to other regions.

OTHER MEDICAL TOPICS: ADDITIONAL

SIGHT THREATENING ACUTE ANGLE – CLOSURE GLAUCOMA

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Keywords. Acute angle closure glaucoma; Visual loss; Painful eye; Ophthalmic emergency

Introduction. Acute angle-closure glaucoma is an ophthalmic emergency that occurs due to sudden closure of the angle of the anterior chamber of the eye, causing an abrupt intraocular pressure (IOP) increase that can lead to blindness, if untreated. Treatment of acute angle closure is very important as long standing angle closure attack impairs visual function and further surgical treatment is necessary to manage the case.

Case Description. 72 year-old female presented to the Department of Ophthalmology with painful left eye and decreased vision for 1 month. 1 month ago she was presented to the Emergency Room (ER) with acute glaucoma attack of the left eye and IOP of 40.6. In the ER intravenous osmotic diuretic was administered (Manitol), IOP decreased to 22.4 mmHg and patient was discharged with topical Brinzolamide and Timolol twice a day. She suffered from mild ocular pain and decreased vision for 1 month. After 1 month during examination visual acuity was 0.1, IOP 50.6, red eye, hazy cornea, shallow anterior chamber, mid-dilated pupil, cataract (glaucomflecken), pale optic disk. With intravenous osmotic diuretics (Manitol) and topical antihypertensive treatment IOP remained high (> 40 mmHg). Lens extraction with IOL implantation and pars plana vitrectomy (PPV) was performed, after the surgery during the follow up visual acuity was 0.4 and IOP decreased to 9 mmHg. Prophylactic peripheral iridectomy (PI) of the right eye was performed.

Summary. This clinical case presents the importance of adequate treatment of acute angle closure attack with decreasing IOP and performing PI as if not sufficiently treated the case later requires surgical treatment with lens extraction and PPV and standing high IOP leads to loss of visual function.

Conclusions. Adequate and timely treatment of angle-closure glaucoma is very important in preserving patients visual function.

A CASE REPORT OF RETINAL ANGIOMATOUS PROLIFERATION

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Keywords. Retinal angiomatous proliferation; Age-related macular degeneration; Choroidal neovascularization; Intravitreal injection

Introduction. In clinical practice, there are 2 main types of exudative age-related macular degeneration (AMD): classic and occult. Meanwhile the scientific literature describes a total of 3, including retinal angiomatous proliferation (RAP). This neovascularization specifically starts at the retina and progresses posteriorly into sub retinal space. RAP is difficult to diagnose because it is a rare pathology (about 20% cases of AMD).

Case Description. A 64-year-old white man presented to the Ophthalmology Outpatient Department with decreased vision in his left eye. Clinical examination revealed visual acuity (VA) (Snellen chart) VOD = 1.0, VOS = 0.8, normal intraocular pressure. Routine and instrumental examinations were performed: OCT, OCT-A, FA. The findings included choroidal neovascularization (CNV), intraretinal fluid, subretinal fluid, hemorrhage, drusen, paracentral areas of retinal pigment epithelium atrophy, and swollen retina in the left eye. After long discussions about the results of the examinations the final diagnosis was made of exudative AMD - RAP. After 3 weeks the treatment was started with ranibizumab, an anti-VEGF intravitreal injection (IVT). The efficacy of the treatment was monitored by VA testing and OCT examination. After the first dose of IVT, VA improved to VOS = 0.7, after the second, third and fourth doses improved to VOS = 1.0. After the 4th IVT, the OCT examination showed changes: OS macular parafoveal CNV with mild scarring and reduced retinal swelling. 4 months after the start of the treatment the patient's condition has improved, and further follow-up is prescribed.

Summary. A 64-year-old patient experienced a decreased vision in the left eye, after a rare diagnosis of RAP IVT were performed and his condition successfully improved.

Conclusions. While it is challenging to diagnose RAP, this case report represents the importance of applying appropriate evaluations and interventions to diagnose and treat this rare pathology.

SEVERE VISION IMPAIRMENT IN A PATIENT DIAGNOSED WITH LEBER HEREDITARY OPTIC NEUROPATHY

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Keywords. Leber hereditary optic neuropathy; Pathogenic mitochondrial DNA

Introduction. Leber hereditary optic neuropathy (LHON) is one of the most common hereditary optic neuropathies. The three most common mtDNA point mutations are: m.3460G > A MT-ND1, m.11778G > A MT-ND4 and m.14484T > C. The disease causes painless, extreme visual impairment and commonly affects young adult males. Idebenone is the only approved drug for the treatment of LHON.

Case Description. A 38-year-old male patient presented with severe visual impairment in both eyes. The time between onset of symptoms and genetic confirmation of the disease was 9 years. Visual acuity (Snellen chart, Landolt C optotype) was 0.04 in the right eye and 0.02 in the left eye. Impairment of color vision was also noted. The patient saw 38 and 41 of 135 points in the right and left eyes, respectively, on full-field vision testing. On slit lamp examination, anterior pole findings were within normal limits. Ophthalmoscopy revealed discolored optic nerve disks (OND). Optical coherence tomography of the retinal nerve fiber layer showed severe atrophy. Visual evoked potential testing registered P1 and P2 waves, although a low-amplitude response to stimuli was observed at 10 Hz. Magnetic resonance imaging of the brain was performed but was inconclusive and showed no other causes of OND atrophy. The patient was genetically tested for suspected LHON, and a MT-ND4 gene variant m.11778G > A was found. Idebenone was prescribed, but the treatment showed no effect.

Summary. LHON is a maternally inherited genetic disorder associated with mtDNA point mutations. This case report demonstrates the importance of genetic testing in patients with severe vision loss.

Conclusions. A homoplasmic pathogenic MT-ND4 gene variant m.11778G > A (p.Arg340His) associated with poor visual outcomes was discovered. The case of our patient confirms this, as treatment with idebenone showed no effect.

A CASE REPORT OF OCULAR TOXOCARIASIS

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Keywords. Ocular toxocariasis; Anti-Toxocara IgG; COVID-19 infection

Introduction. We present a case report of an 18-year-old male who was first diagnosed with ocular toxocariasis (OT) in 2010 and experienced two recurrences of the disease since 2019.

Case Description. An 18-year-old male presented with complaints of decreased vision in his right eye. His medical history revealed that he had been diagnosed with OT 9 years ago, and at that time, a blood test had shown a positive result for serum anti-Toxocara IgG. After treatment, the patient's symptoms had improved, and a focal, raised whitish retinal lesion in the right eye had disappeared. However, in 2019, examination revealed a decrease in visual acuity (VA) (Snellen chart) to 0.3 in the right eye. Slit lamp examination revealed cells in the anterior chamber and vitreous. Fundus examination revealed a swollen optic disc and a whitish, focally raised lesion with a swollen inferotemporal arcade. A blood test revealed eosinophilia, negative anti-Toxocara IgG (tested 6 days after recurrence), and anti-Toxocara IgM was not determined. The diagnosis OT was made based on the patient's history and clinical presentation. The patient was treated with albendazole 400 mg twice daily and topical eye drops for 5 days. All of the above findings improved significantly, and best corrected visual acuity (BCVA) increased to 0.8 within 3 months. Two years later, the patient's vision in the right eye deteriorated after infection COVID -19. Clinical examination revealed a VA of 0.4, and fundus examination revealed an active focal lesion, and systemic treatment was not prescribed at this time. Improvement in the condition was observed, and within 2 months, the BCVA improved to 1.0.

Summary. An 18-year-old patient had two recurrences of OT in two years, but his VA fully recovered.

Conclusions. Monitor patients closely after treatment as parasites can remain in the body for years and cause recurrences.

CASE REPORT: 52-YEAR-OLD WOMAN WITH RARE FORM OF MACULAR SERPIGINOUS CHOROIDITIS

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Keywords. Serpiginous choroiditis (SC); Uveitis; Autoimmune

Introduction. Serpiginous choroidopathy (choroiditis) is chronic usually bilateral inflammation of outer retina and choriocapillaris. Disease typically starts peripapillary and then spreads gradually, in rare cases macula is involved. Main problem of this autoimmune disease is usual recurrence and formation of new foci, which leads to retinal scarring and macular atrophy.

Case Description. years old female consulted in Solomatin eye center with complains about vision loss and grey-white visual fields defects of one month duration in the left eye. Initial vision examination produced best corrected visual acuity (BCVA) of 1,0 in in both eyes, with intraocular pressure and anterior segment normal. Fundoscopic eye examination showed multiple yellow-grey geographic plaques in the left eye, with localization around the optic nerve disc and parafoveal plaque with chorio-retinal scar. In the right eye also were found multiple plaques peripapillary, macula was not involved. Complete systemic study was performed, tests results were normal. Used treatment was oral corticosteroids, methotrexate, mycophenolate mofetil.

Summary. Despite four-year treatment with oral steroids and immunosuppressants remission is not achieved and new lesions can occur. We are going to add biological drugs, such as Adalimumabum to stop SC progression. However, experience with biological drugs treatment is limited.

Conclusions. Serpiginous choroiditis is a rare autoimmune disease and is recurrent over years. Available evidence suggests that SC is an autoimmune process. Treatment of serpiginous choroiditis is still unclear, oral steroids and immunosuppressants have been used, leading to reduction of disease activity, but remission is not achieved.

RARE CASE REPORT: A 26-YEAR-OLD MAN WITH EALES DISEASE

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Keywords. Eales disease (Idiopathic peripheral vascular occlusive disease); Vasculitis; Inflammation; Secondary glaucoma; Anterior chamber paracentesis (ACP)

Introduction. Eales disease is an idiopathic inflammation of the peripheral retinal vasculature, which leads to non-perfusion and ischemia which can be complicated with neovascularization and vitreous body hemorrhage.

Case Description. 26-year-old man consulted in Solomatin eye center with complains about decreased vision and recurrent black floaters. The onset of symptoms was in 2019. On examination, his best corrected visual acuity (BCVA) at the initial presentation was 0.1 in both eyes. The intraocular pressure was 19 mmHg in the right eye and 27 mmHg in the left eye. Slit-lamp and fundoscopic examination of right eye was completely normal. The left eye examination showed pale optic disc nerve, occlusion of small retinal arteries, multiple hemorrhages in different size and shape. He had no accompanying systemic sign and symptoms. Systemic examination was completely normal. The eye condition was managed with focal laser treatment and anterior chamber paracentesis (ACP). Used local treatment was nonsteroid eye dops, prostaglandin analogs, beta blockers and carbonic anhydrase inhibitors. Systemic treatment was intravenous methylprednisolone course, oral corticosteroids, azathioprine, mycophenolate mofetil, Adalimumab and 15 Anti-VEGF injections.

Summary. Despite aggressive treatment with oral steroids, immunosuppressants and biological drugs there were many exacerbations, and remission is not achieved. As result developed secondary glaucoma, which led to total blindness.

Conclusions. Eales disease is often bilateral condition and a diagnosis of exclusion. This case is rare and remarkable in its speed of progression and severity.

ORBITAL DECOMPRESSION SURGERY AS A TREATMENT OF SEVERE GRAVES' OPHTHALMOPATHY: A CASE REPORT

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Keywords. Graves' disease; Ophthalmopathy; Decompression

Introduction. Graves' disease is a common autoimmune inflammatory condition of the thyroid. About one in four of affected patients also develop orbital symptoms like proptosis and diplopia – called Graves' Ophthalmopathy (GO). Orbital decompression surgery is a therapeutic option for these patients with varying success.

Case Description. year old male known to have Graves' disease diagnosed at the age of 52 years and has been on thiamazoli since diagnosis. He presented to the hospital complaining for double vision, eye tearing, eyelid oedema, redness, impaired vision for the last few months. Patient was a smoker for 35 years, continued to smoke during therapy as well. Ultrasonography of the thyroid showed enlarged both lobes of the thyroid, there was multiple, different sized nodes classified as TIRADS2 and TIRADS3 on the chronic thyroiditis structure. Thyroid was with a non-homogeneous structure, highly enhanced vascularization as in chronic autoimmune thyroiditis. Radiological examination showed bilaterally hypertrophied and enlarged extraocular muscles, compressed extraconal and intraconal fat tissue which led to compression on the optic nerves bilaterally at the tip level. Also severe proptosis bilaterally was spotted on the CT scan. Since systemic glucocorticoid therapy didn't help to stop the progress of the disease, a decision was made in favour of orbital decompression surgery as a therapeutic option. Surgery of both eyes was performed within two weeks.

Summary. CT is the most commonly utilized imaging technique for evaluating GO. Objective measures of appearance change include proptosis and fat prolapse. Imaging studies may be particularly helpful when decompressive surgery is planned. Awareness of this clinical presentation is important, as early detection and treatment can prevent visual complications.

Conclusions. Graves' Ophthalmopathy is a variant and therapeutically challenging disease. Orbital decompression surgery proved to be effective in saving the patients eyesight and improving quality of life.