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PREFACE

Dear students,

It is my great honor and pleasure to welcome you all on behalf of Rīga Stradiņš University to the International Student Conference “Health and Social Sciences”. As the hosts of this event we take great pride in the fact that the RSU Student Conference has grown to become the largest student conference in the Baltics.

“International” is by no means a coincidence, neither in the title of the conference, nor in the strategy of RSU. The universities of tomorrow need to think globally, and for that particular reason we put export of education and research high on our agenda. Only by going global we can achieve a vibrant economy, healthy society and individual welfare.

This annual conference is a significant event for each participant as it brings together students and experts from different fields. Therefore I am sure that this conference will make an important contribution towards promoting high quality science among young researchers and the importance of science in the study process.

I am delighted to see such widespread interest and meet enthusiastic participants with poster and oral presentations. I wish you a fruitful and successful conference and I hope it will open up great opportunities for all.

Professor Aigars Pētersons
Rector of Rīga Stradiņš University

Dear participants, colleagues and friends,

We are honoured to welcome you to the International Student Conference in “Health and Social Sciences” 2018 at Rīga Stradiņš University. Every year the conference grows larger thanks to the rigorous work of the Student Council and this year is no exception – we have accepted more than 300 active participants of which 30% are international students to share their scientific discoveries, not to mention the ever-growing number of passive participants. A team of local and international jury members has once again been assembled to ensure the conference is of the highest quality and to encourage the exchange of knowledge between the leading experts of Europe.

We are proud to say that this is first year that the conference will be held over the course of two days – March 16th and 17th. A two-day event will enable students not only immerse themselves in science by presenting their scientific work, but also be able to choose from a variety of other engaging opportunities such as attending the lectures of world class keynote specialists, participating in diverse workshops as well as learning more about the host country. Furthermore, by developing the social programme with the addition of international events and continuing the Homestay programme we have aimed to integrate local and international students alike to celebrate what unites us all – passion for science.

We are delighted you have decided to participate in the conference and we wish you the best of luck in presenting your scientific work. Enjoy your time in the RSU ISC 2018 and make the most of your experience by embracing all opportunities both academic and social.

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Chair of the Organising Committee
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THE RATING OF MENTAL HEALTH IN PATIENTS WITH CHRONIC CARDIAC INSUFFICIENCY

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Keywords. Chronic heart failure, cognitive impairment, MoCA test.

Introduction. Heart failure (HF) is a major health problem in developed countries. Cognitive impairment is one of the most common co-occurring chronic conditions among elderly people with HF. Presence of cognitive impairment may interfere with self-care that is the active decision-making process aimed to maintain health, deal with incident disease and operate changes in personal behaviors or specific treatment if necessitated by worsening symptoms. HF could be one of the factors that affects cognitive functions because of the reduction of cerebral blood flow. At the same time those changes could be way more multifactorial and more related to aging.

Aim. To rate the cognitive functions in patients with chronic heart failure in different stages, (no history of psychiatric diseases or structural heart defects), and to compare the results to the control group (other hospitalized patients with no history of HF, age > 50, no history of psychiatric disease or structural heart defects) to find out if HF affects cognitive functions or cognitive impairment is more age (or other factor) related condition.

Materials and methods. Each patient was evaluated by The Montreal Cognitive Assessment (MoCA) test. Forty five patients participated in this study. Twenty five (mean age 73.8) were HF patients with NYHA class II-IV and twenty patients (mean age 76.8) that were hospitalized with other problem except HF. Both groups were compared with MoCA test score (< 26 points indicated cognitive impairment).

Results. 89 % of HF NYHA class II scored < 26 points, 100 % of NYHA class III-IV scored < 26 points, 62 % of control group scored < 26 points. Mean score in NYHA class II was 19 points, NYHA class III-IV – 19 points, control group – 21 points. Mean score in each section that described different functions was higher in control group.

Conclusion. In HF patients cognitive impairment was found more frequent than in control group. It does not exclude that there are other factors that may be involved in this condition, but when HF patient is treated this should be kept in mind to reach better treatment goals.
SOME ASPECTS OF ANEMIC SYNDROME IN PATIENTS WITH CHRONIC HEART FAILURE

Authors: Meera Shanker, Nataliia Pavliukovych, Oleksandr Pavliukovych

Scientific research supervisor: Prof. Kolomoiets Myhailo Yurijovych

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Keywords. Chronic heart failure, anemia.

Introduction. It is known that decreasing of hemoglobin (Hb) level below 12 g/dL is accompanied by progression of chronic heart failure (CHF) of ischemic origin.

Aim. To find out frequency and origin of anemic syndrome (AS) in patients with CHF.

Materials and methods. We analyzed 2056 case records of hospitalized patients with CHF of ischemic origin. AS was diagnosed in case of Hb below 130 g/dL in males and below 120 g/dL in females (WHO, 2003).

Results. Among all examined patients AS was found in 69.21% (1423 cases), which corresponds to the literature data. Among male patients AS was diagnosed in 1147 cases (76.22%), in females – in 276 cases (49.19%). We found out that in patients after 45 years anemia is more frequent in males than in females. Only in rare cases anemia was documented as a separate diagnosis (2.81% in case of mild anemia, 50% in case of moderate anemia, 65.8% in case of severe AS). Hyperchromic anemia (MCH > 33 pg) was diagnosed in 23 patients (1.62%), hypochromic anemia (MCH < 27 pg) – in 128 patients (8.99%); in most cases AS was of normochromic character (1272 patients, 89.39%). Mild macrocytosis (MCV 95–108) was found occasionally (19 cases, 1.34%), microcytosis (MCV < 80) – in 163 cases (11.45%), normocytosis – in 1241 patients (87.21%).

Conclusion. AS is comorbid to CHF in 69.21% of patients, predominantly in males. In most patients with CHF concomitant anemia is normochromic and normocytic, which requires further investigation of its etiology for an adequate correction of hemoglobin level.
BLEEDING RATE DURING ANTICOAGULATION THERAPY FOR PATIENTS WHO USE EXCESSIVE P GLYCOPROTEIN INHIBITORS

Authors: Linda Kalniņa, Estere Urbančika

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Keywords. Anticoagulants, excessive P-glycoprotein inhibitors, bleeding rate.

Introduction. Nowadays more often medical professional has to deal with patient comorbidities and have to treat several diseases. Anticoagulants play important role in atrial fibrillation treatment. Additionally, more often patients use other drugs which can interfere with anticoagulant leading to increased absorption. One group of these drugs are P-glycoprotein inhibitors. They are efflux transporters and play an important role in drug transport in many organs. In the gut, P-glycoprotein pumps drugs back into the lumen, decreasing their absorption. In case of anticoagulation therapy, this can lead to increased anticoagulant level in plasma and can cause severe adverse effects such as bleeding.

Aim. The aim of the study is to compare the bleeding ratio between patients with and without adjuvant excessive P-glycoprotein inhibitor usage during anticoagulation therapy.

Methods and results. In real life prospective cohort study, we conducted surveys of 569 patients who used anticoagulants in Pauls Stradiņš Clinical University Hospital Latvian Centre of Cardiology between August 1, 2016 and January 3, 2018 and divided them into 2 groups depending if they are using excessive P-glycoprotein inhibitors (n = 324) or they are not using excessive P-glycoprotein inhibitors (n = 245) as an adjuvant therapy. Distribution between genders were similar – 278 women and 291 men. Mean CHA₂DS²-VASc score is 3.1. Using SPSS program for statistical analyse, we found that total 314 patients (55.2 %) from both groups had bleeding episodes according to the International Society on Thrombosis and Haemostasis criteria. During this anticoagulation therapy, patients in the non P-glycoprotein inhibitor group had a lower bleeding rate – 123 patients (39.2 %) with bleeding episodes and in P-glycoprotein inhibitor user group there were 191 patients (60.8 %) with bleeding episodes (p = 0.03).

Conclusion. During anticoagulation therapy, more than half patients had bleeding episodes. Additional P-glycoprotein inhibitor usage during anticoagulation therapy, significantly increase bleeding risk.
NUMBER OF EVERYDAY USED DRUGS IN PATIENTS THAT USE ANTICOAGULANTS AND DRUG-DRUG INTERACTIONS BETWEEN THOSE

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Keywords. Anticoagulants, drug-drug interaction, P-glycoprotein inhibitors.

Introduction. Cardiac patients to prevent thromboembolic events are using anticoagulants. However, these patients often have comorbidities that require daily use of additional drugs. Several medications have mechanistic interactions with anticoagulants, caused by P450 CYP3A4 inhibition or P-glycoprotein inhibition. Drug-drug interactions and different clinical factors impact anticoagulant plasma levels that can lead to either undertreatment or overtreatment.

Aim. The aim is to collect real-life study statistics about amount of everyday used drugs by cardiac profile patients, including anticoagulants and to identify within those the number of drugs that can interact with anticoagulants and recognize proportion of excessive P-glycoprotein inhibitor usage.

Material and methods. We performed analysis of 565 patients’ cases who used anticoagulants in Pauls Stradiņš Clinical University, Latvian Centre of Cardiology between August 1, 2016 till January 3, 2018. The method used was patient’s surveys. Data was analyzed with SPSS program.

Results. Of the 565 surveyed patients 276 (48.9 %) were women and 289 (51.1 %) were men. Throughout – 26 (4.6 %) patients used 2 drugs daily, 55 (9.7 %) used 3 drugs, 97 (17.0 %) patients used 4 drugs, 107 (18.8 %) used 5 drugs, 103 (18.1 %) used 6 drugs, 73 (12.8 %) used 7 drugs, 55 (9.7 %) patients used 8 drugs, 24 (4.2 %) patients used 9 drugs, 15 (2.6 %) patients used 10 drugs daily. 11 and 12 drugs were each consumed by 5 (0.9 %) patients daily. Additionally, out of 565 patients, 269 (47.6 %) patients used 2 drugs with drug interaction, from which 176 (65.4 %) used at least one excessive P-glycoprotein inhibitor (p < 0.001). 123 (21.8 %) patients used 3 drugs with drug-drug interactions, from which 109 (88.6 %) used at least one excessive P-glycoprotein inhibitor (p < 0.001). There were 33 (5.8 %) patients who used 4 drugs with drug-drug interaction, from which 31 (93.9 %) used at least on excessive P-glycoprotein inhibitor (p < 0.001). Respectively, 7 (1.2 %) and 1 (0.2 %) used 5 and 6 drugs that have drug interaction, from which all (100 %) included at least one excessive P-glycoprotein inhibitor. Overall- 433 (76.6 %) patients used 2 or more drugs with drug-drug interactions from which 324 (74.8 %) used at least 1 drug with excessive P-glycoprotein inhibitor. 164 patients used 3 or more drugs with drug-drug interaction from which 48 (29.3 %) used two medicaments with excessive P-glycoprotein inhibitor.

Conclusion. On average, cardiac profile patients used 6 drugs every day, including anticoagulant. 8 out of 10 from study included patients use 2 or more drugs with drug-drug interactions. Greater part of patients who use 2 or more drugs with drug interactions included at least one excessive P-glycoprotein inhibitor. One third of patients who use 3 or more drugs with drug-drug interaction included two excessive P-glycoprotein inhibitors.
COMPARISON BETWEEN AGE GROUPS OF DAILY USE OF ADDITIONAL DRUGS TO ANTICOAGULANT AND THEIR DRUG INTERACTIONS

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2 Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology

Keywords. Age, everyday drug amount, drug-drug interactions, anticoagulants.

Introduction. With increased age patients often have comorbidities and use additional drugs to treat them. Patients widely use anticoagulants to prevent thromboembolic events. Several medications have drug interactions with anticoagulants that can impact anticoagulant plasma levels and eventually lead to either under-treatment or overtreatment.

Aim. The aim of the study is to identify differences between age groups of total amount of drugs used by patients who use anticoagulants and to identify within those the number of drugs that can interact with anticoagulants.

Material and methods. We performed analysis of 569 patients’ cases who used anticoagulants in Pauls Stradiņš Clinical University, Latvian Center of Cardiology between August 1, 2016 till January 4, 2018. Patients were divided in 3 age groups and used patient’s surveys to collect data which was analyzed with SPSS program.

Results. Overall, we divided 569 surveyed patients into 3 age groups: 153 (26.9%) patients were in 1st age group under 60 years; 291 (51.1%) patients were in 2nd age group between 61 and 75 years; 125 (22%) patients were in 3rd age group over 75 years. In 1st age group (< 60 years) patients daily used 1–11 drugs. On average using 4.8 drugs per day. Majority of this group – 137 (89.5 %) patients – used from 2–7 drugs daily. 2nd age group (61–75 years) patients daily used from 2–11 drugs, with mean value 5.8 drugs per day. Majority of second group – 275 (94.5 %) patients used from 3 to 9 drugs daily. 3rd age group (> 75 years) patients used from 2 to 14 drugs daily, with average value 6.5 drugs per day. Majority of this group 108 (86.4 %) patients used from 4 to 10 drugs daily. (p < 0.001). Additionally, we noticed significant difference in drug amount with drug interactions between 1st age group and combined 2nd and 3rd age group. From all 569 surveyed patients 134 (23.6 %) used one medicament with drug-drug interactions. This group consisted of 48 patients – 31.4 % of 1st age group and 86 patients or 20.7 % of combined 2nd and 3rd age group. (p = 0.016) From all 569 patients 33 (5.8 %) used 4 drugs daily with drug interactions, which consisted of 1.3% or 2 patients of 1st age group and 7.5 % or 31 patients of combined 2nd and 3rd age group. (p = 0.006).

Conclusion. There is noticeable increase in daily consumed medicaments with advanced age. Patients who are younger than 60 years have bigger probability of using only one drug with potential drug interaction, but patients who are older than 60 years have significant increase in using 4 drugs with drug interaction.
DOES THE ANTICOAGULATIVE THERAPY INFLUENCE THE HEALTH-RELATED QUALITY OF LIFE FOR ATRIAL FIBRILLATION PATIENTS?

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Keywords. Anticoagulative therapy, atrial fibrillation, quality of life.

Introduction. The anticoagulative therapy for high-risk atrial fibrillation patients is recommended for lowering the stroke risk. These patients are indicated to use this medicine on daily basis, for warfarin users also including diet modification and frequent INR control, that is not needed for direct oral anticoagulants (DOACs).

Aim. Compare whether the oral anticoagulant type has an influence on health-related quality of life for high-risk non-valvular atrial fibrillation patients.

Materials and methods. This prospective research was carried out at Pauls Stradiņš Clinical University hospital from October 2016 till December 2017. After signing informed consent form patients were interviewed face-to-face including demographic questions, medical history, daily used medication and SF-36 questioner for health-related quality of life for seven health concepts – general health, physical functioning, role limitations due to physical health problems, emotional well-being, social functioning, role limitations due to personal or emotional problems and energy-fatigue level. Patients were divided into three groups – warfarin users, DOAC users and patients who did not use any kind of oral anticoagulant for stroke prophylaxis. All data were collected with Microsoft Excel and statistical analysis using descriptive analysis, one-way ANOVA and Kruskal-Wallis H test were performed.

Results. From 348 patients 43.5 % were male and 56.5 % – female with the average age of 71.3 (SD 9.8) years and mean CHA2DS-VASc score 4.4. For general health the mean satisfaction in percentage terms were 32.9 % for warfarin users, 39.7 % for DOAC users and 40.8 % for non-users; physical functioning for warfarin users – 53.2 %, DOAC users – 69.4 %, non-users – 61.8 %; role limitations due to physical health problems for warfarin users – 40 %, DOAC users – 53.8 %, non-users – 50 %; emotional well-being for warfarin users – 71.4 %, DOAC users – 76.2 %, non-users – 71.7 %; social functioning for warfarin users – 67.9 %, DOAC users – 77.5 %, non-users – 78.2 %; role limitations due to personal or emotional problems for warfarin users – 50 %, DOAC users – 60.2 %, non-users – 58.3 %, and energy-fatigue level for warfarin users – 46.8 %, DOAC users – 54.4 %, non-users – 50.0 %. There was found a statistically significant difference between the groups comparing physical functioning (p = 0.002) and energy-fatigue levels (p = 0.045), DOACs being superior to warfarin and social functioning (p = 0.018) non-users being superior to warfarin users.

Conclusion. There is a statistically significant difference among the groups in specific health-related quality of life sections – physical functioning (p = 0.002) and energy-fatigue levels (p = 0.045) DOACs being superior to warfarin and social functioning (p = 0.018) non-usage being superior to warfarin.
HOW OFTEN ATRIAL FIBRILLATION PATIENTS WHO USE ORAL ANTICOAGULANTS HAVE A POTENTIAL DRUG INTERACTION RISK?

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Keywords. Polypharmacy, oral anticoagulants, CYP-450, P-glycoprotein, atrial fibrillation.

Introduction. Polypharmacy among elderly patients is a common finding. Atrial fibrillation patients who use multiple drugs daily, mainly for heart conditions, as well as food supplements are exposed to a potential drug-drug interaction risk, that arises because of one metabolic pathway through CYP-450 and P-glycoprotein.

Aim. The purpose of this study is to detect what part of high-risk atrial fibrillation patients who use anticoagulation therapy daily are exposed to potential drug interactions, that could possibly increase the oral anticoagulant concentration in blood serum, therefore raising the bleeding risk.

Materials and methods. This prospective study was conducted in Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology over 15 month period from October 2016 till December 2017. After signing an informed consent form a face-to-face interview was held, that included demographic questions, medical history, daily and frequently used medication. Data were collected with Microsoft Excel program and descriptive statistical analysis were made with SPSS Statistics.

Results. 239 patients were included in this study, of which 43.7 % were male and 56.3 % female. The mean age – 70.5 (SD 10) years. Of all the patients 49.8 % (199) had potential drug interactions – 38.1 % (91) with medium and 21.8 % (52) with high risk. Multiple potential drug interactions were found for 17.2 % (41) patients and single potential drug-drug interactions for 32.6 % (78). For warfarin users (120) the potential drug interactions were with selective serotonin reuptake inhibitors/serotonin-norepinephrine reuptake inhibitors (SSRIs/SNRIs) 0.8 % (1), rosuvastatin – 7.5 % (9), omega-3 supplements – 22.5 % (27), proton-pump inhibitors (PPI) – 16.7 % (20), aspirin – 5.8 % (7), clopidogrel – 1.7 % (2), nonsteroidal anti-inflammatory drugs (NSAIDs) – 14.2 % (17), amiodarone – 16.7 % (20). For dabigatran users (33) with amiodarone – 12.1 % (4), omega-3 supplements – 18.1 % (6), PPI – 24.2 % (8), spironolactone – 3.0 % (1), NSAIDs – 6.0 % (2), aspirin – 3 % (1), clopidogrel – 3 % (1). For rivaroxaban users (86) with SSRIs/SNRIs – 1.2 % (1), amiodarone – 23.3 % (20), omega-3 supplements – 24.4 % (21), NSAIDs – 5.8 % (5), aspirin – 1.2 % (1), clopidogrel – 1.2 % (1), verapamil – 1.2 % (1).

Conclusion. Potential drug interactions are an existing problem among many (49.8 %) high-risk atrial fibrillation patients, who use oral anticoagulants daily. For warfarin users the most common potential interactions were with omega-3 supplements (24.4 %), PPI (16.7 %), amiodarone (16.7 %). For dabigatran – with PPI (24.2 %), omega-3 supplements (18.1 %), amiodarone (12.1 %). For rivaroxaban users – with omega-3 supplements (24.4 %), amiodarone (23.3 %).
EVALUATION OF DISEASE MANAGEMENT AND KNOWLEDGE IN LATVIAN HYPERTENSIVE PATIENTS

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Keywords. Hypertension, compliance, lifestyle.

Introduction. Hypertension is a very common condition with well-established treatment guidelines. Although highly preventable, hypertension still remains one of the leading causes of disability and death worldwide, especially affecting countries of low- and middle-income, including Latvia. Adequate treatment provides significant economic benefits. Both adherence to medication and lifestyle changes are crucial for the management to be successful.

Aim. The aim of our study was to evaluate the compliance with antihypertensive treatment and possible factors that might predict poor adherence.

Materials and methods. The cross-sectional study was conducted among 100 hypertensive patients between October and December 2017 in Pauls Stradiņš Clinical University Hospital. A questionnaire was created to assess general patient knowledge about hypertension, daily habits, complications and medications. Medical histories of 70 patients were also studied. Data were analysed by IBM SPSS. p-value less than 0.05 was considered to determine the statistical significance.

Results. Among the 100 patients interviewed, 65% were female and 79% were in the age group of 60 years and older. 41.7% and 34.4% were found to be overweight and obese, respectively. 46% (67.6% of male patients) admitted not undertaking any physical activities and 66.7% of patients reported following no instructions regarding diet. 52.1% stated always taking their hypertension medication as instructed while 37.5% admitted not taking their medication 1–3 times a month. 10.4% reported not following the instructions repeatedly. Forgetfulness was the cause of non-adherence in 61.7%, while 10.6% of patients were found to be non-adherent due to a perception that hypertension doesn’t require treatment. A statistically significant (p = 0.029) correlation was found between engaging in physical activities and compliance with treatment. Patient histories showed 45.1% of patients to have a level of creatinine higher than normal. 63% were found to have LVH by assessing ECG or Echo. 36.4% of patients reported hospitalization due to hypertension at least once a year.

Conclusion. The results show that compliance with medication is higher than engaging in a healthy lifestyle. Patients may feel that medication alone is enough to manage their disease. The results also present that there’s still a group of hypertensive patients that do not believe the condition demands treatment. This could be explained by the vastly asymptomatic nature of this disease. Thus, broader patient education about the mechanisms of hypertension and its treatment is vital.
BLOOD PRESSURE RESPONSE DURING EXERCISE IN HYPERTENSIVE PATIENTS

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Keywords. Hypertension, bicycle ergometry.

Introduction. Hypertension has been shown to be a risk factor for a wide variety of diseases, affecting virtually every organ system. Antihypertensive treatment has been crucial in preventing adverse outcomes and reducing the disease burden of this ubiquitous disease. The role of bicycle ergometry in assessing the response to antihypertensive treatment has yet to be clearly elucidated. In this study, we investigated whether hypertension during bicycle ergometry was correlated with known cardiac risk factors.

Aim. The aim of the study was to investigate correlations between known cardiac risk factors and hypertension during exercise in patients receiving antihypertensive medication.

Materials and methods. The study examined data from 106 subjects (n = 51 [48 %] females and n = 55 [52 %] males, average age 55.1 years), collected from Riga 1st Hospital’s Department of Neurology. The parameters investigated included BMI, smoking, blood lipid profile (including total cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL) and triglycerides (TG)) and blood glucose level. Estimated glomerular filtration rate (eGFR) was calculated using the Cockroft-Gault formula. Exercise hypertension was defined based on formulas acquired from a study of normotensive subjects by Wielemborek-Musial et al.

Results. A higher percentage (80 %) of women were found to have a hypertensive response to exercise than men (49 %). No statistically significant difference was found between smokers and non-smokers and their blood pressure response to exercise. Using multiple regression analysis (adjusted R squared = 0.24), correlations were found between eGFR (p < 0.001), total cholesterol (p = 0.015), and the number of anti-hypertensive drugs used on the day of the test (p = 0.002). Total cholesterol had the strongest impact on the regression model. No statistically significant correlation was found between blood pressure during exercise and BMI, blood glucose, LDL, HDL, TG or number of anti-hypertensive drugs used on a regular basis.

Conclusion. Excessive blood pressure response to exercise was found to be correlated with several cardiac risk factors in 106 patients with diagnosed hypertension. Further studies are needed to assess the value of bicycle ergometry as a diagnostic tool for assessment of effectiveness of pharmacological treatment in patients using antihypertensive medications.
ASSOCIATION BETWEEN BLOOD PRESSURE AND UNHEALTHY BEHAVIOR IN MID-ADULTHOOD

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Keywords. Arterial blood pressure, body mass index (BMI), waist circumference.

Introduction. Overweight and obesity in children and adolescents is becoming a serious problem worldwide due to inadequate physical activity and unhealthy dietary habits which results in an increased risk of heart disease, high blood pressure, diabetes and many other chronic conditions. Evidence supports that unhealthy behaviour in mid-adulthood including smoking and consuming caffeinated beverages affect blood pressure (BP).

Aim. The purpose of this study was to determine the association between blood pressure with body mass index, waist circumference and the use of caffeine and nicotine independently or in combination in youth.

Materials and methods. Prospective observational cross-sectional study enrolled students from 8 High Schools in Vilnius. A total of 228 healthy school children aged from 13 to 18 years (mean age: 16.09 ± 0.96) were analyzed. BMI, waist circumference, systolic and diastolic blood pressure were measured and the survey, which contained questions on smoking and the consumption of caffeinated drinks, was conducted. According to the BMI, the population was divided into 4 groups: I < 18.5, II 18.5 – 25, III 25–30, IV > 30. Based on European Cardiology Society guidelines, population was divided into 5 groups and compared with each other according to their BP: normal, prehypertension, first, second and third stage of hypertension. Statistical analysis was performed with SPSS Version 11.0 statistic software package.

Results. The study population consisted of 228 adolescents (56.8 female and 43.2 male). Distribution of the analyzed students by the BMI: 1st group 33 (14.47 %), 2nd group 176 (77.19 %), 3rd group 16 (7.02 %), 4th group 3 (1.32 %) students. Girls had higher BMI more often than boys (p < 0.001). A normal BP was found in 190 students (83.3 %). Children with normal BMI had normal or lower BP than those who were overweight or obese (p < 0.05). From all research participants 175 (76.76 %) students do not smoke, 53 (23.24 %) do smoke. 39 (17.10 %) children deny coffee consumption, 83 (36.40 %) consume coffee rarely, 53 (23.25 %) – several times a week and 53 (23.25 %) – every day.

Conclusion. Higher BMI correlates with higher BP. Students who smoke and consume caffeinated drinks tend to have higher BP than those who do not smoke or consume no or small amounts of caffeinated drinks. However, there is no difference between participants who do not consume caffeinated drinks and those who consume it rarely.
PREVALENCE AND RISK FACTORS OF PREHYPERTENSION AMONG ADULTS AGED 18–35 YEARS

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Keywords. Prehypertension, risk factors, prevalence.

Aim. To estimate the prevalence and to identify risk factors of prehypertension among adults aged 18–35 years.

Methods. Prospective observational cross-sectional study enrolled healthy volunteers aged 18–35 years. Exclusion criteria: diagnosis of hypertension or other cardiovascular disease. Data was collected using a questionnaire about behavioural risk factors (smoking, alcohol, physical activity, dietary habits) and a 24-hour blood pressure (BP) monitoring. The population consisted of 218 volunteers (47.2 % women and 52.8 % men). Mean age was 26.21 ± 4.46 years. The population was divided into 3 groups according 24-h blood pressure measurements: normotension (BP < 120/80 mmHg), prehypertension (BP 120–139/80–89 mmHg) and hypertension (BP ≥ 140/90 mmHg). Data were analyzed using SPSS v23 statistical package.

Results. Of 218 examined volunteers, 117 (53.7 %) subjects were normotensive, 91 (41.7 %) were prehypertensive and 10 (4.6 %) were hypertensive. Blood pressure was significantly higher (p < 0.001) among men: prehypertensive level in 79.1% of group and hypertensive level in 80 % of group. Normotensive volunteers (25.11 ± 3.88 years) were younger than prehypertensive (27.09 ± 4.54 years) and hypertensive (31 ± 5.44 years). Means of age significantly differ between all groups: normotension and prehypertension (p = 0.003), normotension and hypertension (p < 0.001), prehypertension and hypertension (p = 0.018). 41.2 % of prehypertensive volunteers were smokers and 35.4 % of them were surrounded by smokers. Participants with prehypertension had the highest coffee consumption – 43.3 % of them were daily coffee drinkers. Body mass index (BMI) was significantly higher as the blood pressure increases: BMI 25–30 kg/m² was found in 68.4 %, BMI > 30 kg/m² – in 80 % of prehypertension and hypertension groups (p < 0.001). Statistically significant difference between normotensive (mean of waist circumference 73.88 ± 10.21 cm) and prehypertensive (89.79 ± 13.84 cm) groups in means of waist circumference (p < 0.001) was found. Family history of hypertension was also a risk factor for prehypertension (p = 0.026).

Conclusion. The prevalence of prehypertension was found to be high, especially in men, and increases with age. Risk factors such as overweight or obesity, higher waist circumference, family history of hypertension were associated with prehypertension.
EFFECTS OF REVASCULARIZATION ON MYOCARDIAL STRAIN IN STABLE CORONARY ARTERY DISEASE PATIENTS

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Keywords. Myocardial strain, percutaneous coronary intervention (PCI), left ventricular (LV) systolic function, stable coronary artery disease (SCAD).

Introduction. Myocardial strain detected by transthoracic echocardiography is a more sensitive method for systolic function evaluation than ejection fraction. Impact of coronary revascularization on systolic function in SCAD patients remains an object of research.

Aims. Determine myocardial strain values before and after PCI. Determine how stenosis localization and diastolic function impact myocardial strain changes.

Materials and methods. 36 SCAD patients with single lesion in left anterior descending artery (LAD) undergoing PCI were included in a single center prospective cohort study from December 2015 to December 2017. Patients with previous myocardial infarction, coronary vessel occlusions, stents in LAD or left main artery, PCI in previous 3 months time in left circumflex or right coronary artery, atrial fibrillation at the time of study were excluded. In study group there were no patients with medium or pronounced left ventricular hypertrophy, II–III degree valvular regurgitation, any valve stenosis, hypo- or akinetic segments visually, or decreased ejection fraction. Transthoracic echocardiography at rest was performed the day before PCI and 3 months after. Acquired images were measured by TOMTEC ARENA, using 16-segment model, and results analysed using SPSS 22.

Results. Mean age in the study group was 67 years. Out of 36 patients, 22 (61 %) were men. 16 (44 %) patients had proximal 1/3 LAD stenosis, 16 (44 %) had diastolic dysfunction. Mean GLS before and after the revascularisation was 16.22 ± 1.14 % and 19.43 ± 1.35 respectively (Δ = 3.21; p < 0.001) and improvement remained statistically significant in each of 16 segments, too.

When comparing results in subgroups, delta (change) after revascularisation in proximal LAD group was 3.61 % ± 1.79 (p < 0.001) and in middle 1/3 LAD group 2.9 % ± 1.33 (p < 0.001). Difference between subgroup results was statistically significant (p = 0.02).

Delta in normal diastolic function group and diastolic dysfunction group was 3.18 ± 1.89 (p < 0.001) and 3.26 ± 1.09 (p < 0.001) respectively, and difference between subgroups was not statistically significant.

Conclusion. In this small prospective cohort study PCI in SCAD patients was associated with statistically significant LV myocardial strain improvement. Stenosis localization but not diastolic function had statistically significant impact on LV myocardial strain.
ESTIMATION OF CARDIOVASCULAR RISK LEVEL IN PRIMARY HEALTH CARE PATIENTS USING THE SCORE CHART AND ASSESSMENT OF ITS REALIZATION FOR 10 YEARS

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Keywords. SCORE, cardiovascular, risk.

Introduction. SCORE – Systematic Coronary Risk Evaluation – a cardiovascular disease risk assessment system initiated by the European Society of Cardiology, covering a wide geographic spread of countries at various levels of cardiovascular risks. The SCORE risk estimation is based on the following risk factors: gender, age, smoking, systolic blood pressure, total cholesterol, and estimates fatal cardiovascular disease events over a ten-year period.

Aim. To estimate the cardiovascular risk level in primary healthcare patients using the SCORE chart and assess its realization in the period of 10 years.

Materials and methods. The retrospective study was conducted at the certificated family doctor’s practice in Riga examining all the last 10 years records of patients in age of 40–65 years excepting those who didn’t correspond to the SCORE chart criteria. In this study, patients individual cardiovascular risk was evaluated as it was before 10 years and then compared with the risk realization until now. A total of 480 patient records were collected: 150 men and 330 women. The mean age – 52.8 years (SD 6.4). Data was processed by Microsoft Excel and SPSS programs. Statistical analysis was performed using Spearman’s correlation coefficient, epidemiological data analysis was performed for detection of parameters frequency.

Results. Proceeding of data revealed 14.1% of patients having a high the SCORE chart risk index. Elevated risk (≥ 5%) was detected in 5.8% of women but cardiovascular disease (CVD) events in the period of the next 10 years presented only in 5.3% of this risk group. The third part of men (33.3%) were evaluated as having high individual risk and 20% of them had CVD for 10 years. CVD was registered in 7% of the respondents (5.8% of the low-risk and 16% of the high-risk patients). There was detected significant differences in the risk level and CVD correlation between men (rs = 0.21; p < 0.005) and women (rs = 0.14; p < 0.005), with men having higher one. Total risk/CVD correlation was evaluated as weak (rs = 0.24; p < 0.005). Atorvastatin was used by 45% of the high-risk patients and 24% of the low-risk patients.

Conclusion. According to the study, sensitiveness of this test presented to be higher in men. Total CVD risk level and the CVD events correlation is weak. Possibly it is due to Atorvastatin which was used by almost a half of the high-risk group. This aspect needs to be researched in the future study.
ADHERENCE TO EVIDENCE-BASED THERAPIES
6 MONTHS AFTER ACUTE CORONARY SYNDROME

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Keywords. Acute coronary syndrome, adherence to evidence-based therapies.

Introduction. Pharmacological secondary prevention in patients after an acute coronary syndrome (ACS) has contributed substantially to reductions in cardiovascular morbidity and mortality, however, there is still a considerable adherence gap and opportunity for improvement.

Aim. To assess adherence to secondary prevention medications 6 months after acute coronary syndrome and analyse reasons for patient non-compliance.

Materials and methods. A prospective study includes patients with ACS, hospitalized in Pauls Stradiņš Clinical University hospital. During the period from September 2016 until March 2017 78 patients were interviewed. Data from medical records were collected. 6-month follow-ups were conducted by telephone interview. The obtained data were analysed by IBM SPSS.

Results. 6 months after discharge follow-up was conducted from 67 patients. Dual antiplatelet therapy (DAPT) was recommended to 94 % of those patients. At follow-up 67.2 % use DAPT. Lipid lowering therapy was recommended to 65 patients (97 %). At follow-up 86.6 % use statins. Atorvastatin 80mg was recommended to 54 patients (80.6 %), after 6 months 64.2 % take the same dose.

Beta blockers were recommended to 58 patients (86.6 %). At follow-up 71.6 % use beta blockers. Angiotensin-converting enzyme inhibitors (ACEI) were recommended to 55 patients (82.1 %). After 6 months 58.2 % use ACEI.

Main reason for non-adherence to DAPT was the price of medication (13.4 %).

19 % of patients lack motivation to take statins at the recommended dose. In majority of patients general practitioner (GP) or cardiologist changed the regimen of pharmacotherapy.

At follow-up 17 patients (25.4 %) had experienced adverse drug effects. 35.3 % of those patients were smokers (p < 0.05; OR 4.9).

Conclusion. Adherence to recommended pharmacotherapy at 6-month follow-up was suboptimal. Patients often lack motivation or financial resources to follow the recommendations of the pharmacotherapy. In majority of cases changes in pharmacotherapy were attributed to decision of consulting cardiologist or GP.

25 % of patients had experienced some kind of adverse effect. There was a significant association between observed adverse effects and smoking status.
PREDICTORS OF IN-HOSPITAL MORTALITY IN PATIENTS WITH INFERIOR MYOCARDIAL INFARCTION COMPLICATED WITH CARDIOGENIC SHOCK

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Keywords. Inferior, myocardial, infarction, cardiogenic shock.

Introduction. Right ventricular myocardial infarction (RVMI) is usually associated with inferior myocardial infarction, isolated RVMI is extremely rare because of its smaller muscle mass, which requires less oxygen. Inferior myocardial infarction with RVMI involvement is considered to have a more negative impact on patient status, outcomes when compared with inferior myocardial infarction with no RVMI involvement. However, there is only few data how right ventricle involvement in inferior myocardial infarction affects prognosis on cardiogenic shock.

Aim. To investigate predictors of in-hospital mortality after acute inferior myocardial infarction.

Materials and methods. A retrospective study was conducted in Vilnius University Hospital Santaros Clinics. We examined 894 patients who were hospitalized with inferior myocardial infarction diagnosis between October 2013 and December 2015. We separated patients in two groups: with RVMI involvement and no RVMI involvement. Epidemiological and clinical data was collected: gender, age, Killip class, in-hospital mortality. All data were analyzed with SPSS 23.00, using Mann-Whitney, Student t-test and chi square test.

Results. Total number of patients involved in the study were 894 (men 621 (69.5 %); women 273 (30.5 %)), the mean age of patients were 66.15 ± 12.24. There were 818 (91.6 %) patients with ST segment elevation and 75 (8.4 %) without ST elevation, Killip I was assigned to 628 (70.2 %) patients, II–III – 168 (18.8 %), IV–98 (11 %). Out of 894 patients 612 (68.4 %) had inferior myocardial infarction without RV involvement and 282 (31.5 %) with RV involvement. Comparing these groups we found that there is significantly higher rate of IV Killip class patients with RV involvement vs. no RV involvement (17.7 % vs. 7.8 %, p < 0.001), in cases with I and II–III Killip class-no difference was found. In-hospital mortality rate was not significant between groups, however, in-hospital mortality rate in IV Killip cases was significantly lower within patients with RV involvement vs. with no RV involvement (30 % vs. 50 %, p = 0.043), in other Killip cases in-hospital mortality rate difference was not significant.

Conclusion. Cardiogenic shock is responsible for higher in-hospital mortality but its role in inferior myocardial infarction differs depending on RVMI involvement. Right ventricular myocardial infarction is involved in more IV Killip cases, although is not responsible for higher in-hospital mortality rate for patients with cardiogenic shock.
HEART CONDUCTION AND RHYTHM DISORDER RATE, PROLONGED PROGNOSIS AFTER INFERIOR MYOCARDIAL INFARCTION

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Keywords. Inferior myocardial infarction, conduction, rhythm disorders.

Introduction. Inferior myocardial infarction can be with or without right myocardial infarction (RVMI). There are some studies that suggest RVMI involvement might be linked with higher rate of heart conduction and rhythm disorders. This might lead to poorer prolonged prognosis.

Aim. To investigate heart conduction and rhythm disorders in inferior myocardial infarction with or without RVMI involvement, influence on in-hospital, 2 year life prognosis.

Materials and methods. A retrospective study was conducted in Vilnius University Hospital Santaros Clinics. We examined 290 patients who were hospitalized with inferior myocardial infarction diagnosis between July 2014 and December 2015. We separated patients in two groups: with RVMI involvement and no RVMI involvement. Epidemiological and clinical data was collected. All data were analyzed with SPSS 23.00, using Mann-Whitney, Student t-test and chi square test.

Results. Out of 290 patients 91 (31.4%) were women, 199 (68.6%) were men. There were 268 (92.4%) patients with ST segment elevation and 22 (7.6%) without ST elevation, Killip I was assigned to 193 (68.9%) patients, II–III – 52 (18.6%), IV – 35 (12.5%). Out of 290 patients 62.7% had inferior myocardial infarction without RV involvement and 37.3% with RV involvement. Comparing these groups, we found that there is significantly higher rate of rhythm disorders in patients with RVMI vs. no RVMI (40% vs. 26.3%, p = 0.02). Atrial fibrillation rate was significantly higher (17.7% vs. 7.8%, p < 0.001). Heart conduction disorders was also more common in patient with RVMI involvement (38% vs. 20.5%, p = 0.002). Especially high difference was found with AV block rate, higher rates were found in group with RVMI involvement (28% vs. 8.2%, p = 0.001). In-hospital mortality rate was not significant between groups, 2 year mortality rate was higher in patient with RVMI (4.5% vs. 3%, p = 0.03).

Conclusion. RVMI involvement in inferior myocardial infarction has shown to have influence on heart conditions and survival rates. It is responsible for higher heart rhythm and conduction disorder rate. In-hospital mortality does not differ, although 2 year mortality rate appears to be higher when RVMI is involved.
CLINICAL OUTCOMES OF ATRIAL FIBRILLATION
PATIENTS 6 MONTHS AFTER DIRECT
CURRENT CARDIOVERSION

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Keywords. Direct current cardioversion, atrial fibrillation, clinical outcomes.

Introduction. For some patients with atrial fibrillation, direct current cardioversion (DCCV) is one strategy that can be used to establish sinus rhythm. However, the long term clinical event and sinus rhythm maintenance rates following direct current cardioversion are variable among studies.

Aim. The aim of this study was to investigate the outcomes 6 months after direct current cardioversion.

Materials and methods. A prospective study includes patients with electrocardiographically confirmed atrial fibrillation who underwent direct current cardioversion, hospitalized in Pauls Stradiņš Clinical University hospital. During the period from January 2017 until April 2017 84 patients were interviewed. All participants provided written informed consent. Data from medical records were collected. 6-month follow-ups were conducted by telephone interview. The obtained data were analysed by IBM SPSS.

Results. Mean age of patients was 64.6 years (SD = 10.4), 50 % were men. 19 % of patients had diabetes mellitus, PAH were in 48 % patients, 15 % had stroke, and 8 % myocardial infarction.

5 patient atrial fibrillation paroxysm was till 48 hours, 37 (44 %) was more than 7 days, but 36 (42 %) didn’t know when arrhythmia appeared. 67 % of patients had before episodes of atrial fibrillation and 39 % had DCCV. Amiodarone pretreatment had 40 (47 %). 22 (26.4 %) patients were anticagulated with warfarin and 57 (63.6 %) with one of NOACs; 32 (38.1 %) with rivaroxaban and 21 (25 %) with dabigatran.

Sinus rhythm was restored immediately in 92 % patients.

6 months after discharge 3 patients died from stroke. 1 patients didn’t use anticoagulants, but 2 of 3 patients use oral anticoagulants (Warfarin and Xarelto). 32 (39 %) of patients within 6 months had atrial fibrillation one episode, and 10 (12 %) at least 2 episodes. Overall during 6 months 51 % had suffered at least one atrial fibrillation paroxysm. (28.6 %) patients were hospitalised due arrhythmia and 8 (9 %) due other reasons. 20 (23.6 %) patients had repeat direct current cardioversion. Heart failure and history of myocardial infarction, showed statistical significant tendency to increase the risk of hospitalization.

Conclusion. Two patients died of stroke, although they used anticoagulants. This raises the question of possible causes – warfarin may be associated with poorly controlled INR and Xarelto inaccurate use. Though electrical cardioversion for AF has a high initial success rate only a half of patients remained in sinus rhythm after 6 months.
ATRIAL FIBRILLATION AND METABOLIC STATUS – PATIENT CHARACTERISTICS

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Keywords. Metabolic syndrome, atrial fibrillation, diabetes mellitus, obesity.

Introduction. 4 out of 5 criteria for metabolic syndrome are known risk factors for atrial fibrillation, thus a link between them is likely. However, existing data on the association between the two is lacking and often contradictory. This connection should be further investigated, especially with the growing prevalence of metabolic syndrome – estimated around 35% in EU according to CHRIS study.

Aim. To compare the life quality, disease burden and effectiveness of medical therapy between 3 groups of patients – metabolically healthy (MH), with metabolic syndrome (MS) and with diabetes mellitus (DM).

Materials and methods. A cross-sectional study of Latvian Center of Cardiology Arrhythmology Department patients with atrial fibrillation. Patients were asked to fill in a questionnaire regarding their life quality, disease burden, lifestyle and medication adherence. Data on medication, polymorbidity and blood analysis was collected from medical histories. Patients were sorted into 3 categories according to the National Institutes for Health guidelines criteria for MS and data analysed using SPSS 22.

Results. From 133 patients, 51 were in MH group, 58 in MS group and 24 had DM. Average age was 62.59 in MH, 67.59 in MS and 66.25 in DM group (p = 0.045). Most common form of atrial fibrillation was persistent – MH 49%, MS 65.5%, DM 75%, with MH having the highest incidence of permanent AF (7.8%) (p = 0.221). There was a similar number of smokers and patients with self-reported low medication adherence in all groups. High life quality was reported 5.9% in MH, 15.5% in MS, 29.2% in DM group (p = 0.19). Best EHRA median value was observed in DM group (29.2% reporting mild symptoms), worse in MS group (41.4% reporting severe symptoms with affected daily life) and the worst in MH group (47.1% reporting severe symptoms) (p = 0.46). Majority of patients had 1–2 polymorbidities in MH and MS group and 3–5 in the DM group (p = 0.003), with most of the patients in all groups using 4–9 drugs daily. Mean low density lipocholesterol (LDLH) was 2.81 mmol/L in MH, 2.36 mmol/L in MS and 2.03 mmol/L in DM group (p = 0.001). Mean body mass index (BMI) was 26 in MH, 32 in MS and 37 in DM group (p = 0.001).

Conclusion. Overall patients with MS fared worse than MH group, but better than patients with DM, showing a correlation between MS and a more complicated course of AF similar to that associated with DM. As expected DM patients had highest number of polymorbidities and BMI, but surprisingly lowest LDLH and best self reported quality of life.
THE IMPACT OF DIABETES AND OBESITY ON THE SEVERITY AND LONG-TERM MORTALITY AFTER PULMONARY EMBOLISM

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Keywords. Pulmonary embolism, diabetes, obesity.

Introduction. Venous thromboembolism (VTE) encompasses deep vein thrombosis (DVT) and pulmonary embolism (PE) (Konstantinides et al., 2014). Diabetes mellitus (DM) and obesity are known as risk factors for VTE (Piazza et al., 2010), and a notable impact of DM and obesity on the severity of PE has been observed (Poowanawittayakom et al., 2014). However, the magnitude of this impact has not been fully elucidated (Scherz et al., 2011).

Aim. To evaluate the significance of DM and obesity on the severity and long-term mortality after pulmonary embolism.

Materials and methods. The prospective cohort study population included 270 consecutive patients with symptomatic acute PE in a single university hospital from 2014 till 2017. PE was confirmed by CT pulmonary angiography. All patients were followed up at 90 days and 1 year after PE. Body Mass Index (BMI) and Pulmonary Embolism Severity Index (PESI) were calculated for all patients. All data were analyzed by IBM SPSS 23.0.

Results. The age of patients ranged between 19 and 93 years with the mean age of 67 (standard deviation (SD): 16; 95% confidence interval (CI) = 65–69) years. The study population was predominantly females ~ 63% (n = 170). DM was present in 16.3% (n = 44) of patients (females 72.7% (n = 32), p = 0.174). Statistically significant difference was observed in PESI values between patients with DM (median 94 (IQR 84–108)) and without DM (median 86 (IQR 69–99)), p = 0.006. The value of BMI ranged between 14.20 and 58.83 kg/m² with mean value of 29.22 ± 6.22 kg/m². No statistically significant difference between PESI values and BMI classes was observed, p > 0.05. At 90-day follow-up, patient mortality was 12.3% (n = 30; mean BMI in non-survivors was 27.25 ± 6.69 kg/m² vs. 29.54 ± 6.17 kg/m² in survivors, p = 0.146); DM was present in 31.0% (n = 9) of non-survivors vs. 15.3% (n = 33) in survivors, p = 0.02. At 1-year follow-up, patient mortality was 16.0% (n = 39; mean BMI in non-survivors was 26.61 ± 6.23 kg/m² vs. 29.77 ± 6.15 kg/m² in survivors, p = 0.86); DM was present in 27.5% (n = 11) of non-survivors vs. 12.71% (n = 31) in survivors, p = 0.001. No statistically significant difference was found between BMI class, DM and length of inpatient stay, p > 0.05.

Conclusion. The study showed statistically significantly higher PESI values in patients with DM compared to individuals without DM. Both 90-day and 1-year mortality was significantly higher in patients with DM. BMI did not demonstrate any significant impact on PE severity and long-term mortality.
EVALUATION OF ANNUAL INCIDENCE OF CHRONIC THROMBEMBOLIC PULMONARY HYPERTENSION (CTEPH) IN LATVIA

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Keywords. Pulmonary hypertension, chronic thrombembolic pulmonary hypertension.

Introduction. Chronic Thrombembolic Pulmonary Hypertension (CTEPH) is a distinct form of pulmonary hypertension (PH), classified as group 4 in the ESC/ERS 2015 PH guidelines (Gall et al., 2017). It’s characterised by mechanical obstruction of the pulmonary arteries due to presence of organised fibrotic thrombi tightly attached to the tunica media of pulmonary arteries. The thrombi may completely or partially occlude the arteries, resulting in increase of pulmonary vascular resistance (PVR) and pulmonary artery pressure (PAP), leading to PH. This can cause right heart failure and can be fatal. (Lang, 2015) Epidemiological data for CTEPH are limited and available data suggests that CTEPH is underdiagnosed and undertreated, and there is an urgent need to increase awareness of CTEPH.

Aim. The aim of this study was to evaluate the annual diagnosed incidence of CTEPH patients in Latvia and to compare the results with data from USA, Japan and other European countries.

Materials and methods. During a period from January 1st – December 31st 2017, all patients with confirmed CTEPH after RHC were interviewed at Pauls Stradiņš Clinical University Hospital and their anamnesis was gathered. On the patients capable, a 6 minute walking test was done to evaluate their functional class according to the NYHA classification. Annual diagnosed incidence of CTEPH was calculated and compared with data from USA, Japan and Europe. Considering that all patients with suspected CTEPH are sent for a consultation and subsequent right-heart catheterisation to PH center in Pauls Stradiņš Clinical University Hospital, the amount of CTEPH patients diagnosed there depicts the annual diagnosed incidence of CTEPH in Latvia.

Results. Altogether 21 patients were diagnosed with CTEPH based on the diagnosis criteria during the year 2017. 76 % were female (N = 16), 24 % male (N = 5). The calculated annual diagnosed incidence in the Latvian population (1,96 million people) amounted to 10.7 cases per million population. For the year 2015, the full annual incidence (diagnosed and undiagnosed) of CTEPH in France, Germany, Italy, Spain, the UK, the USA and Japan was estimated to be 32’636 cases or 43 cases per million population. But only 16 % of these cases would be diagnosed, making the mean annual diagnosed incidence of CTEPH 7.0 cases per million population (Gall et al., 2017). Of the patients able to perform the 6 minute walking test (N = 15), 20 % were NYHA FC II (N = 3), 40 % NYHA FC III (N = 6), 40 % NYHA FC IV (N = 6).

Conclusion. The annual diagnosed incidence of CTEPH in Latvia is higher than the mean diagnosed incidence in USA, Japan, UK, France, Germany, Italy and Spain – 10.7 cases and 7 cases per million population respectively. 80 % of patients able to perform the 6 minute walking test classify as NYHA FC III or IV, indicating the late diagnosis of the disease. Many patients go undiagnosed and untreated, considering that the estimated full incidence (diagnosed and undiagnosed) of CTEPH in USA, Japan and Europe is about 30–50 cases per million population (Gall et al., 2017).
AMBULATORY VS. OFFICE BLOOD PRESSURE MONITORING IN RENAL TRANSPLANT RECIPIENTS

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Keywords. Hypertension, renal transplantation, blood pressure monitoring.

Introduction. Hypertension is common after renal transplantation and contributes to shortened patient and allograft survival and increased fatal and nonfatal cardiovascular events. Ambulatory blood pressure monitoring (ABPM) is better at overall blood pressure (BP) assessment and it is necessary to diagnose nocturnal hypertension, which is also implicated in poor outcomes.

Aim. The aim of the study was to investigate the potential differences between ambulatory blood pressure monitoring and office hypertension in renal transplant patient in Santaros Clinics, Lithuania.

Materials and methods. We conducted a retrospective study in the Nephrology Center of Santaros Clinics in Vilnius, Lithuania. Demographic, clinical and biochemical data (glucose, estimated glomerular filtration ratio, proteinuria, urea, serum lipids, hemoglobin, albumin, potassium, calcium and ionized calcium, creatinine) of patients included in this study were extracted from the electronic patient database at our institution. An office average systolic blood pressure (sBP) and diastolic blood pressure (dBP) were assessed on the same day as the ambulatory blood pressure. We have defined these hypertension thresholds – 24-hour average ABPM (130/80 mmHg or greater); daytime ABPM (135/85 mmHg or greater), nighttime ABPM (120/70 mmHg or greater). Furthermore, data of heart echocardiography – PWTd, left ventricle hypertrophy (E/A ratio) and ejection fraction (EF) were collected.

Results. We studied 31 patients, out of which 15 patients were women and 16 patients were men. Average body mass index was 25.19 and mean serum creatinine at ABPM day was 308.22. The main cause for end stage renal disease in kidney transplant patient was chronic glomerulonephritis (26%). Our study revealed that 81% of patients had hypertension, 13% of patients had masked hypertension, 6% of patients had “white-coat” hypertension. In addition, patients were separated into 2 groups: first group had nocturnal hypertension and second group nocturnal BP was normal. Serum urea concentration were significantly higher in nocturnal hypertension group (p = 0.006). Low-density lipoprotein concentration in nocturnal hypertension group were significantly lower than in other group (p = 0.036). In addition, our study results showed positive correlation between urea and higher blood pressure at night (+ 0.571). Low-density lipoprotein and higher blood pressure at night had a negative correlation (- 0.307).

Conclusion. We observed a large prevalence of hypertension in kidney Tx patients, also important existence of masked hypertension and a small but important incident of “white-coat” hypertension. Although office BP tends to overestimate BP burden, both office BP and 24 hours ABPM are useful tools for the management of hypertension in renal transplant recipients.
RENAL TRANSPLANTATION RESULTS OF PATIENTS DIAGNOSED WITH PRIMARY GLOMERULONEPHRITIS

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Keywords. Kidney allotransplantation, primary glomerulonephritis.

Introduction. Over 40 years in Latvian Centre of Transplantation 1919 kidney transplantations were performed. According to the literature in 30–50% of kidney transplant recipients the underlying cause of end-stage renal disease (ESRD) is glomerulonephritis (GN). After renal transplantation patients risk of recurrence of the disease varies and may reach 50%. The main reasons for allograft loss are acute rejection, chronic rejection and death with a functioning graft, recurrent glomerulonephritis is the fourth most common cause.

Aim. The aim of the study is to describe kidney allotransplantation results of patients diagnosed with primary glomerulonephritis and the potential risk factors of the allograft function loss.

Materials and methods. 181 patients (males 99/181, median age – 42 years (IQR 35–51)) in Pauls Stradiņš Clinical University Hospital, Centre of Transplantation primarily diagnosed with glomerulonephritis who had their last kidney allotransplantation held during 2003–2014 were involved in study and their case files were observed till 31.12.2017. Data was analyzed using SPSS software (descriptive statistics, binary logistic regression analysis).

Results. During observation period 49/181 patients had their allograft function lost and were initiated another renal replacement therapy modality. 5/49 patients lost their transplant due to progressive transplant nephropathy. 11/49 – recurrent GN. 6/49 – rejection. 2/49 – patients death. 1/49 – primary transplant dysfunction and 2/49 – unknown reasons. First year transplant survival rate was 95% (n = 172), three-year survival rate – 87% (n = 158). Median graft survival, among patients who lost its function, was 4 years (IQR 1.0–6.5). Better graft survival was significantly associated with absence of active viral hepatitis (OR = 3.7, p = 0.003), absence of congestive heart failure (OR = 12.7, p = 0.002) and the primary graft function (OR = 2.7, p = 0.016), but not with patient gender, age, body mass index, blood group, duration of renal replacement therapy prior transplantation, number of transplantations, type of GN and other comorbidities (diabetes, oncology and autoimmune disease).

Conclusion. Current study demonstrates that the first year kidney transplant survival rate among patients with primary GN in Latvia is similar comparing to the studies from other countries. Better graft survival was significantly associated with absence of active viral hepatitis, absence of congestive heart failure and the primary graft function. No association was found with the other factors.
INFLUENCE OF PRE-TRANSPLANT DIALYSIS MODALITY ON REPEATED KIDNEY TRANSPLANTATION OUTCOMES

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Keywords. Kidney transplantation, patient and graft survival, dialysis.

Introduction. It has been established that transplantation is the treatment of choice for eligible patients with end-stage renal disease. Unfortunately, for most of the patients’ dialysis should be initiated while awaiting a donor kidney. There has been a debate on whether the choice of dialysis modality may affect results of transplantation. Studies comparing transplantation outcomes between haemodialysis (HD) and peritoneal dialysis (PD) show conflicting results, furthermore, it has not been studied in the settings of repeated transplantation.

Aim. To evaluate the influence of pre-transplant dialysis modality before the last transplantation on graft function and patient and graft survival in the case of repeated transplantation.

Materials and methods. Single centre, retrospective study was conducted. There were included patients who underwent repeated kidney transplantation between 2005. and 2013. Patients were divided in groups based on the dialysis modality (PD vs. HD) before the last transplantation. Graft function was evaluated by eGFR, assessed by MDRD formula. Oneand three-years graft and patient survivals were assessed by Kaplan–Meier analysis. For statistical analysis IBM SPSS Statistics 21.0 was used.

Results. Study population comprised 64 adult repeated kidney transplantation recipients, 54.7 % of them were female. Mean age at the time of transplantation was 41.89 ± 12.89 years. The majority of patients underwent a second transplantation (n = 55; 85.9 %), while 12.5 % (n = 8) underwent a third and only 1.6 % (n = 1) a fourth kidney transplantation. 21 of patients received PD before their repeated kidney transplantation and 43 patients – HD. There was statistically significant difference in graft function at the time of hospital discharge with better graft function observed in the PD group (p = 0.03) after one year this parameter revealed trend towards significance (p = 0.06), but after three years graft function had become similar. One-year graft survival was 90.5 % in PD group and 86 % in HD group. Three-years graft survival was 81 % in PD group and 76.7 % in HD group. Only two patients were lost during three-years follow-up. Therefore, there was no statistically significant difference in patient survival rates during three-years follow-up. One patient in HD group was lost due to severe cardiovascular complications, other, in PD group, due to infectious complications – Pneumocystis jirovecii pneumonia with sepsis.

Conclusion. Our findings report that pre-transplant dialysis modality does not influences results of repeated transplantation.
ACUTE KIDNEY INJURY AFTER ORTHOTOPIC LIVER TRANSPLANTATION: RISK FACTORS

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Keywords. Kidney, injury, liver, transplantation.

Introduction. Acute kidney injury (AKI) is one of the most common complications after liver transplantation. AKI extends the duration of hospitalization and is associated with increased mortality and additional hospital costs.

Aim. To determine risk factors of acute kidney injury after orthotopic liver transplantation in the case of preoperative, intraoperative and postoperative factors.

Materials and methods. A retrospective study of 59 patients who underwent orthotopic liver transplantation between 2005 and 2015 at Vilnius University Hospital Santaros Clinics. Patients were divided into two different groups: patients with AKI that developed within seven days after surgery and patients with no AKI. Kidney function were estimated according to KDIGO recommendation (kidney injury consider when creatinine concentration increases by 1.5 times). Preoperative, intraoperative and postoperative factors were evaluated. Univariate logistic regression models were used to evaluate the probable risk factors. Data were analyzed using SPSS V. 21 and considered statistically significant with p < 0.05.

Results. Renal injury was developed in 31 patients (52.5 %), mean age 46.3 ± 10.1, 24 males. On the first postoperative day 17 patients evolved AKI. Logistic regression analysis revealed reliable determinants of development of AKI after surgery: intraoperative blood lactate concentration (OR 1.459, 95 % CI 1.043–2.040, p = 0.027), intraoperative blood loss (ml) (OR 1.001, 95 % CI 1.000–1.002, p = 0.047), intraoperative arterial blood pH levels (OR < 0.001, 95 % CI 0.000–0.032, p = 0.015); first postoperative day SOFA score (OR 1.842, 95 % CI 1.204–2.819, p = 0.005), APACHE score (OR 1.416, 95 % CI 1.083–1.850, p = 0.011), blood lactate concentration (OR 2.161, 95 % CI 1.135–4.113, p = 0.019) and creatinine concentration (OR 1.040, 95 % CI 1.016–1.064, p = 0.001). Patients age, diabetes, arterial hypertension, preoperative pH, creatinine, albumin, bilirubin, sodium, urea concentrations in the blood did not affect an onset of kidney injury.

Conclusion. According to our study significant risk factors of AKI after liver transplantation are intraoperative lactate concentration, blood loss during surgery, intraoperative pH level, first postoperative day SOFA and APACHE II scores, concentrations of lactate and creatinine.
LIVER TRANSPLANTATION: A DECADE REVIEW OF 64 PATIENTS IN LITHUANIA

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Keywords. Liver, transplantation, review.

Introduction. Each year more than 4000 orthotopic liver transplantation (LT) are performed in the United States. Cirrhosis is the 12th leading cause of death for adults and it is the main indication for this operation. In Lithuania every year more than 60 people are waiting for a liver transplant though only 12 to 15 recipients are undergoing surgery. Only a few scientific publications on liver transplantation in Lithuania were carried out.

Aim. To review the most common indications for LT, LT rate, tests data and complications.

Materials and methods. A retrospective study, which included 64 liver-transplant patients during 2005–2015 in Vilnius University Hospital Santaros Clinics. Statistical analysis was performed using Microsoft Excel, SPSS V.20 software, the data is considered to be statistically significant if p < 0.05.

Results. 24 (38 %) out of 64 participants were females and 40 (62 %) – males. The mean of age was 46.52 ± 9.9 years. The most common indications for LT were cirrhosis induced hepatitis C virus (26 cases (43.8 %)), cirrhosis induced hepatitis B virus (10 cases (15.6 %), micronodular cirrhosis (8 cases (12.5 %)). Average MELD score was 18.13 ± 5.48. Average creatinine concentration before LT was 86.95± 66.54 mmol/l. 31 (48.4 %) recipients developed acute renal failure after LT. 12 (18.8 %) patients were diagnosed with sepsis. Laparotomy was performed on 34 (53.1%) patients. Average surgery duration was 7.3 ± 1.4, time in intensive care unit after LT – 12.9 ± 10.8. 14 patients (21.9 %) died after LT. There was no significant difference between MELD score, liver disease etiology and mortality.

Conclusion. The main indication for LT was hepatitis C virus induced cirrhosis. Half of the patients developed renal insufficiency. Mortality rate was 22 %. There was no significant difference between liver disease etiology and mortality.
INCIDENCE OF NEPHROPATHY IN TYPE 2 DIABETES MELLITUS PATIENTS TREATED WITH METFORMIN CORRELATES WITH RS11212617

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Keywords. Type 2 diabetes mellitus, nephropathy, rs11212617 genotype.

Introduction. Metformin is peroral antidiabetic drug widely used as the first line agent in treatment of type 2 diabetes mellitus (T2D). It improves insulin sensitivity in muscles and liver, and increases utilisation of glucose. Diabetic nephropathy is one of the late complications of T2D. Prevalence of nephropathy in T2D patients is estimated 30–50%. Risk of development of nephropathy increases with patient's age (Gheith et al., 2016) and correlates with hyperglycemia, hypertension and hyperlipidemia, as well as genetic factors (Jayakumar, 2012). Good control of glucose level is thought to reduce the risk of developing this and other complications. Genetic variant rs11212617 was identified in first genome-wide association study (GWAs) of metformin efficacy as predictor of glycemic response to metformin.

Aim. To investigate probable correlation between incidence of nephropathy in T2D patients treated with metformin in respect to genetic biomarker of metformin efficacy.

Materials and methods. In the frame of the prospective T2D study OPTIMED the history of medication use and data on complications was collected by endocrinologist from n = 304 T2D patients. A standard venous blood sample was collected from each participant to extract DNA and genotype was obtained by using Illumina Veracode GoldenGate assay. Statistical analysis were performed by using MS 2010 and IBM SPSS 18.0.

Results. Participants using metformin as monotherapy or in combination with other antidiabetic peroral drugs and/or insulin were divided into two groups according to rs11212617 polymorphism resulting in 153 (AA + AC) and 46 (CC) patients. Mean age of patients in the group with AA + AC genotype was 61.9 ± 9.4 years and n = 98 (64%) of group were women, and BMI mean value was 32.91 ± 6.39 kg/m². Mean age of patients in the second group was 64.8 ± 9.9 years and n = 30 (68 %) were women, and BMI mean value was 35.04 ± 8.44 kg/m². In AA + AC group mean dose of metformin per day was 1747.4 ± 583.4 mg and mean Hb1Ac was 6.96 ± 1.06 %. In CC group these values were 1786.36 ± 597.6 mg and 7.56 ± 1.4 %, respectively. In AA + AC group 54.7 % of cases were prescribed combined peroral antidiabetic therapy and 14.0 % were using insulin in comparison to CC group with numbers – 60.9 % and 17.4 %, respectively. There were statistically significant difference between groups (p < 0.05). The association of CC genotype with incidence of nephropathy cases (n = 12) was statistically significant (p = 0.007) and remained on the borderline of statistical significance after correction with covariates (HbA1c, cholesterol, antihypertensive therapy, duration of metformin therapy, duration of diabetes, use of other drugs and insulin).

Conclusion. This study for the first time analysed and identified possible correlation between rs11212617 genetic variant with incidence of nephropathy in patients with T2D using metformin therapy. Further research in larger sample is needed to validate obtained results.
A SENSITIVITY OF BACTERIAL WOUND CULTURES FOR EMPIRIC ANTIMICROBIAL THERAPY IN PATIENTS WITH DIABETIC FOOT INFECTION

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Keywords. Antibacterial treatment, diabetic foot infection.

Introduction. Diabetes mellitus (DM) and its late complications are global challenges today. Diabetic foot infection (DPI) is one of the most common cause of hospitalization, lower limb amputation and disability in patients with DM. DPI requires appropriate antibacterial therapy. Correct use of antimicrobials is necessary to achieve better clinical outcome of DFI treatment and minimize antimicrobial resistance. Proper wound culture test should be performed before starting empiric antibacterial therapy for assessment antibiotic sensitivities of wound cultures. In case of a failure of empiric antibacterial therapy of DPI wound cultures antibiotic sensitivity test is helpful for a choice of etiotropic antibacterials.

Aim. The aim of the study is to analyze a frequency of bacterial wound cultures antibiotic sensitivities for empiric antimicrobial therapy in patients with diabetic foot infection.

Material and methods. In this retrospective study we analysed a records of history disease of patients with DPI who were treated at the Clinic of Surgical infection of the Riga East Clinical University Hospital “Biķernieki” in 2014, 2015 and 2016. We analysed a frequency of wound culture testing performance, infectious agents and their sensitivities to antimicrobial agent after sowing from wound and used empirical antimicrobials.

Results. The study included 158 patients; 69.62 % were males, mean patient’s age 64.68 (min 42, max 93) years. Wound culture test was performed in 81 patients from 158, but before starting empirical antibacterial therapy – only in 48 patients (59.23 % of all wound culture tests). In 61.73 % of wound culture tests polymicrobial infection was detected; in 33.33 % – monomicrobial with Gram-positive bacteria in 70.37 % of them and one test showed MRSA; in 4 cases (4.94 %) bacteria haven’t grown. The first of choice empirical antimicrobial agent in 106 of 158 patients was Cefazoline; in 32 – Ceftriaxone; in 5 cases – Ampicillin or Clindamycin; Amoxicillin/Clavulanic acid, Penicillin, Vancomycin, Ciprofloxacin and Imipenem were reported in 4 or fewer cases. Bacteria revealed in the wound culture test was susceptible to empirical therapy in only 18.52 % of all tests; in 27.16 % – was not susceptible; in 54.32 % the sensitivity to used empiric antimicrobial was not tested.

Conclusion. In the study population sensitivity of bacterial wound cultures for empiric antimicrobial therapy infection was low. This findings emphasizes a need of appropriate culture acquisition before starting empirical antibacterial therapy in patients with diabetic foot.
POPOPULATION KNOWLEDGE ABOUT PEPTIC ULCER
DISEASE AND OUTCOMES

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Keywords. Peptic ulcer, community knowledge, gastrointestinal bleeding, perforation.

Introduction. Incidence of peptic ulcer disease (PUD) remains common condition. The frequency of stomach and duodenal ulcer in Lithuania in 2015 was 8.1 per 1000 inhabitants. There are a lot of accessible information about risk factors, clinical manifestation and complications of this disease. To develop prophylaxis and improve the outcome of stomach and duodenal ulcers, it is important to evaluate community knowledge about these conditions.

Aim. To evaluate community knowledge about risk factor, clinical manifestation and possible complications of PUD.

Materials and methods. Over a period of two month (April till May, 2017) 186 respondents were questioned using the original questionnaire made by the authors. In the questionnaire respondents were asked about the risk factors, clinical manifestation and complications of PUD. The correct answers were scored on 1 point and wrong with 0 point. Respondents were able to get maximum 26 points. The statistical data analysis was performed using the IBM SPSS 23.0 program package.

Results. 59.1% of subjects were related with medicine and 40.9% were non-related. The answer to the question “Do you think Helicobacter pylori (HP) bacterium can cause PUD?” 81.7% of the respondents answered correctly. Also, 97.8% of our survey participants believe that stress could be a trigger for PUD. More than 95% of the respondents knew that PUD is related with bleeding (97.8%) and perforation (95.7%). The median of total correct scores was 20 (females median was 20, males 19, there was no statistically significant difference). There was statistically significant difference between medicine related and unrelated persons knowledge, median of medicine related subjects was 20, median of medicine unrelated subjects was 19. There was no difference of knowledge between volunteers diagnosed with PUD (median 19) and other respondents (median 20).

Conclusion. Subjects had best knowledge about PUD complications and them treatments methods. Unfortunately, two in ten people did not know about the main risk factor (HP) of this disease. As we expected, medical stuff had better knowledge than other respondents. There were no statistically significance different of knowledge between participants sex or ulcer anamneseis so all persons in the community should be more informed about PUD.
COMPARISON OF ENZYME LINKED IMMUNOSORBENT ASSAY AND RAPID TEST USED IN FECAL CALPROTECTIN DETECTION

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Keywords. Calprotectin, ELISA, Rapid test.

Introduction. As there are growing numbers of inflammatory bowel diseases (IBD) in Latvia, as well in the world, it is very important to early and effectively recognize these patients and treat them. One of possible ways to do this is to detect fecal calprotectin which is non-invasive and objective marker to detect organic diseases in the gastrointestinal tract. It can also help doctors to evaluate disease activity and monitor the response to treatment in patients with IBD. There are several methods how to detect fecal calprotectin but there is discussion whether they are equally precise.

Aim. Evaluate and compare two fecal calprotectin detection methods – Enzyme Linked Immunosorbent Assay (ELISA) (Alegria) and rapid test (CalFast) used in Pauls Stradiņš Clinical University hospital (PSCUH).

Materials and methods. This retrospective study was performed from March till July 2017. For this period of time 18 patients had positive results by CalFast test. For the same 18 fecal samples included, additionally ELISA test was performed. Cut off point for positive result in ELISA is > 50 µg/g and in rapid tests > 70 mg/kg. Further medical history of these patients was studied by reviewing medical records in PSCUH. Results of ELISA and rapid test were compared using SPSS and MS Excel. For evaluation of results, factors influencing fecal calprotectin levels were taken into account, such as nonsteroidal anti-inflammatory drugs and proton pump inhibitor use, acute gastrointestinal and respiratory tract infections, bronchial asthma, gastrointestinal malignancy.

Results. 18 patients who had positive results in both tests were enrolled in this study. 66.7% (n = 12) of patients had endoscopically and histologically confirmed IBD (n = 9 ulcerative colitis, n = 3 Crohn’s disease). 33% (n = 6) of patients had no history of IBD. Spearman’s correlation coefficient (SPCC) for both methods were 0.58 (p < 0.05). SPCC in non-IBD patients was 0.51 but in IBD group 0.55, showing no significant difference in both groups. In 10 patients, result influencing factors were detected. 6 patients who were from IBD group, showed high calprotectin level in both tests, which correlated with their disease activity. In IBD patients who didn’t have influencing factors also showed correlation with their disease activity. Discordant results were observed in non-IBD group regardless of influencing factors.

Conclusion. Both tests are equally precise to detect disease activity in inflammatory bowel disease patients regardless of influencing factors, giving preference to rapid test as it is more cost-effective.
COMPARISON OF CAUSES OF NON-VARICEAL UPPER GASTROINTESTINAL BLEEDING AND INR IN PATIENTS WITH ATRIAL FIBRILLATION TAKING WARFARIN VS. OTHER TYPES OF ORAL ANTICOAGULANTS

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Keywords. Warfarin, anticoagulants, gastrointestinal, bleeding.

Introduction. Anticoagulants are type of medicine that lowers the risk of problems caused by blood clots. These drugs are often prescribed to patients with cardiovascular pathology such as atrial fibrillation. Upper gastrointestinal bleeding is the most common complication in patients receiving long-term oral anticoagulant therapy.

Aim. To investigate causes and of upper gastrointestinal bleeding and international normalized ratio in patients with atrial fibrillation taking warfarin versus patients taking other types of oral anticoagulants.

Materials and methods. 711 patients with atrial fibrillation receiving anticoagulant therapy who were seen at the Vilnius University Hospital Santaros Clinics, during four-year period were enrolled in a retrospective study. 79 out of 711 patients, diagnosed with upper-gastrointestinal bleeding were divided into two groups A and B. Patients in group A received warfarin and B group patients other types of oral anticoagulants. The causes of bleeding between these two groups were evaluated and compared using IBM SPSS Statistics 24 program.

Results. 33 patients were assigned to group A and 46 patients to group B. Mean age in group A was 72.27 (min – 46; max – 87) and in group B 70.78 (min – 44; max – 90). The most common bleeding cause in both groups was stomach ulcer – 15 (46 %) patients from group A and 21 (46 %) patients in group B. Other upper gastrointestinal bleeding causes in group A were: duodenal ulcer (30 %), Mallory-Weiss syndrome (9 %), esophageal ulcer (6 %), erosive gastritis (3 %), erosive esophagitis (3 %) and Cameron lesion (3 %) while in group B – duodenal ulcer (17 %), Mallory-Weiss syndrome (16 %), gastrointestinal angioectasia (7 %) esophageal ulcer (4 %), erosive gastritis (4 %), erosive esophagitis (2 %), stomach polyp (2 %), marginal zone ulcer (2 %). Mean INR in group A was 3.24 and in group B – 1.37 (p < 0.05).

Conclusion. The most common cause of upper gastrointestinal bleeding in patients with atrial fibrillation taking warfarin and other types of anticoagulants is the same – stomach ulcer. Following causes of bleeding reasons in group A were duodenal ulcer, Mallory-Weiss syndrome, esophageal ulcer, erosive gastritis, erosive esophagitis, Cameron lesion. In group B – duodenal ulcer, Mallory-Weiss syndrome, gastrointestinal angioectasia, esophageal ulcer, erosive gastritis, erosive esophagitis, stomach polyp and marginal zone ulcer. INR is above average in both groups but in group A INR is 2.3 times higher than in group B.
CAUSATIVE AGENTS OF PNEUMONIA IN RĪGA STRADINŠ UNIVERSITY HOSPITAL

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**Keywords.** Pneumonia; respiratory tract culture tests.

**Introduction.** Pneumonia is actual problem in all ages over the world. After United Kingdom data every year 0.5–1 % of adults get ill with community – acquired pneumonia. 1.2–10 % of those patients are treated in intensive care unit. From this statistics hospital mortality rate is 5–14 %.

**Aim.** To identified more frequent isolated bacteria from pneumonia patient’s respiratory tract.

**Materials and methods.** From medical documentation find patients with pneumonia diagnosis and positive microbiological answers from sputum, bronchial washing or tracheal aspirate culture tests. After patient identification analyzing data in Microsoft Office Excel 2016 program. This research is made as retrospective study.

**Results.** In year 2017 first 10 months, in Rīga Stradiņš University Hospital’s lung diseases and thoracic surgery centre, 311 times was admitted patients with diagnosis pneumonia. From those times, in 95 (31 %) cases culture tests from respiratory tract were collected. 53 (56 %) patient culture tests came back positive. In one case there were acid resistant bacteria; in 12 (23 %) cases only answer was *Candida species*. In 40 (76 %) patient respiratory tract culture was positive with bacteria stains. The most frequently isolated bacteria were *Klebsiella pneumonia* – 16 % and then *Acinetobacter species* – 14 %. Over 50 % of cases culture were isolated from sputum, but only in 3 % both cultures were positive, which were taken from 2 different sites of respiratory tract.

**Conclusion.** From literature data the most frequently isolated bacteria for patients with community – acquired pneumonia is *Streptococcus pneumonia*, but in our clinic more often isolated is *Klebsiella pneumonia*, *Streptococcus pneumonia* take only 4th place in our research. In most cases culture is isolated from sputum, but in results 20 % of collected cultures came back positive with only *Candida species*. These results do not confirm pulmonary candidiasis and does not exclude it. It makes diagnostic difficulties, because massive *Candida* growth can make negative answer for other probable pneumonia causative agents and in the most cases it means that sample contains mouth flora, where Candida is part of normal microflora.
SURVIVAL DATA OF SEPSIS PATIENTS TREATED WITH EXTRACORPORAL DETOXIFICATION METHODS

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Keywords. Sepsis, sequential organ failure assessment score, continuous renal replacement therapy.

Introduction. Sepsis incidence is rising worldwide and sepsis often results in patients’ death. Usually patients with sepsis are treated in the intensive care units (ICU) and organ support therapy is often essential – continuous renal replacement therapy (CRRT), mechanical lung ventilation (MLV). Sepsis prognosis is often done using sequential organ failure assessment score. CRRT is often used for extracorporeal detoxification, but the data regarding sepsis outcomes in patients is controversial.

Aim. To describe outcomes of sepsis patients who received CRRT and risk factors that may be associated with the worst outcomes in Latvia.

Materials and methods. 52 patients (males 27/52, median age – 68 years (IQR 60–75)) in Riga East Clinical University Hospital who were treated in Toxicology and Sepsis clinic with diagnosis “sepsis” and who received CRRT during 2015–2017 were involved in study and their case files were analyzed. Data was analyzed using SPSS software (descriptive statistics, Cox regression analysis).

Results. During hospitalization period 34/52 of patients have died. Overall median of ICU stay was 7 days (IQR 2.3–11.0), median of hospital stay was 11 days (IQR 3.3–20). Median of time on MLV was 3 days (IQR 1.3–6.8), but on CRRT – 2 days (IQR 1–3). In multivariate model worst survival prognosis was associated with sepsis due to lung infection (HR = 19.3, p = 0.034), female gender (HR = 6.7, p = 0.041) and congestive heart failure in anamnesis (HR = 11.2, p = 0.038), but not other sepsis origins, patient age, diabetes in anamnesis, lung ventilation. SOFA score association with survival was not significant (HR = 1.19, p = 0.164).

Conclusion. Current study demonstrates that survival rate of patients with sepsis in ICU in Latvia is similar comparing to the studies from other countries. Worst survival prognosis is associated with sepsis due to lung infection, female gender and congestive heart failure in anamnesis. No association was found with the other factors. Surprisingly, but patient survival was not associated with the SOFA score.
POLYMORBIDITY EPIDEMIOLOGY IN A REGIONAL PRACTICING FAMILY DOCTOR PRACTICE IN LATVIA

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Keywords. Polymorbidity, family medicine.

Introduction. Polymorbidity, which is two or more chronic diseases in one individual, is a major problem in the ageing population. The severity and variety of the diseases is different from patient to patient which requires an individual management for each visitor in family doctors practice. It results as a decrease of the quality of life and involves regular doctor’s appointments which is a burden to the patient’s daily life and also to the healthcare system.

Aim. Our main goal is to clarify the count of patients with polymorbidity in average regional practicing family doctor’s practice and if there are any combinations of chronic diseases that stand out the most.

Materials and methods. A cross-sectional outpatient cards study. Materials: an overview of the available information on polymorbidity, X family doctors practice outpatient cards. Quantitative methods: instrumentation for data extraction – valid information record in Microsoft Excel from outpatient cards that includes patient’s age, sex, body mass index, waist circumference, congenital and lifetime acquired diseases. Data collection about practice patient count from medical program MEDIUS Qualitative methods: data analysis in SPSS, Microsoft Excel.

Results. From 1359 of X family doctor’s practice patients 599 are determined as legitimate polymorbid patients – 44% of patients. We found individuals who have 2 to 13 different chronic diseases. From 599 chronically ill patients: 22% have 3 chronic diseases, 19% have 4 diseases, 14% have 5 diseases.

For these patients the most common combinations of chronic diseases with two variables are:
1. Hypertension and dyslipidemia (53%);
2. Hypertension and spondylosis (34%);
3. Hypertension and chronic heart failure (26%).

Most common combinations of chronic diseases with three variables are:
1. Hypertension with dyslipidemia and spondylosis (24%);
2. Hypertension with dyslipidemia and diabetes (18%);
3. Hypertension with dyslipidemia and chronic heart failure (16%).

Conclusion. Scientific research concludes that 44% of the people in an average regional practicing family doctor’s practice are polymorbid and it is a large number that should not be ignored. Furthermore, we also note that there are patients who not only correspond to the polymorbidity criteria but also that there are patients who have up to 13 chronic diseases. Therefore, we advise that physicians should draw more attention to the polymorbid patients in order to decrease the risk of health complications and improve their quality of life while further studies are recommended.
ESTIMATION OF THE RISK OF ADVERSE DRUG REACTIONS AMONG GERIATRIC PATIENTS AT A FAMILY DOCTOR’S PRACTICE USING THE GERONTONET ADR RISK SCORE

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Keywords. Polypharmacy, geriatric, adverse, drug, reaction, Gerontonet.

Introduction. Adverse drug reactions (ADR) present a challenging and expensive public health problem resulting in 3–5% of all hospital admissions. Geriatric patients are more prone to adverse reactions due to comorbid conditions, longer lists of medications and sensitivity to drug effects. The GerontoNet ADR risk score is a practical and simple method of identifying patients who are at an increased risk of an ADR. It may help in reducing drug-related illness.

Aim. To evaluate ADR risk due to polypharmacy among geriatric patients in a certificated family doctor’s practice.

Materials and methods. The retrospective cohort study was conducted at a certificated family doctor’s practice in Riga examining all the records of the geriatric patients (≥ 65 years). The ADR risk was calculated using the GerontoNet ADR risk score which includes following criteria: the number of drugs, a history of a ADR, heart failure, liver disease, presence of 4 and more conditions, renal failure (GFR < 60 mL/min). Data was processed by Microsoft Excel and SPSS programs. Statistical analysis was performed using Spearman’s correlation coefficient, epidemiological data analysis for detection of incidence was also used in the study.

Results. It was calculated that almost 70% of 444 geriatric outpatients (the mean age 74 (SD 7.5) years) are at risk of the ADR: definite (9–12 points) – 0%, probable (5–8 points) – 3%, possible (14 points) – 66.4%, doubtful (0 point) – 30.6%. The mean number of conditions – 4.5 (SD 2.1). Men have less conditions (mean 3.4, SD 1.9) than women (mean 4.7, SD 2.1), they use less number of medications (mean 2.9, SD 2.2) than women (mean 3.4, SD 1.9). Despite this fact, both genders have similar mean ADR risk: men – 1.3 points (SD 1.3) and women 1.4 points (SD 1.3) – as well as the other factors of the GerontoNet ADR risk score. The only factor that correlates with gender is liver diseases (rs = −0.29; p < 0.05) which determines the fact that men don’t have less ADR risk despite having less conditions and using less number of medications.

Conclusion. According to the study, a great part of geriatric patients at the primary health care practise are at risk of the ADR, however most of them have only possible risk due to using not so extensive list of medication despite their polymorbidity. This family doctor’s practice is a good example for managing of pharmacological treatment of geriatric patients with polymorbidity. Finding the balance between ADR risk and positive effect of pharmacological treatment – is the key of successful health care practice.
II INFECTIOUS DISEASES, DERMATOVENEROLOGY, MICROBIOLOGY, IMMUNOLOGY, ALLERGOLOGY

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STREPTOCOCCUS PNEUMONIAE INVASIVE INFECTIONS’ TRENDS IN LATVIA

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Keywords. Invasive pneumococcus, infectology, vaccination.

Introduction. Invasive pneumococcal disease (IPD) is defined as an infection confirmed by the isolation of Streptococcus pneumoniae from a normally sterile site (e.g., blood or cerebrospinal fluid). Although vaccination against pneumococcus become more available, invasive IPD is still one of the biggest healthcare challenges. European data shows that the most common isolated serotypes are 3, 8, 22F, 19A and 7F. National immunization in children against pneumococcus was started in 2010. 7-valent pneumococcal conjugate vaccine (PCV) was used for 2 years, when PCV10 was introduced. Most European countries use PCV13. Children vaccination provides herd immunity—a form of immunity that occurs when the vaccination of a significant portion of population gives protection to vulnerable people.

Aim. To analyze IPD serotype distribution, the most common clinical manifestations, risk factors and outcomes in adults (age ≥ 18) at the clinical university hospital (UH), representing a half of the IPD cases in Latvia and to compare isolated serotype coverage by PCV10 and PCV13.

Materials and methods. Retrospective study included 130 patients with IPD hospitalized at UH from 2013 to 2016. Demographic data, clinical manifestations, risk factors, outcomes were analyzed. PCV10 and PCV13 serotype coverage were analyzed according to isolated serotypes. MS Excel and IBM SPSS software were used for data processing.

Results. Totally 43 (33.1 %) females and 87 (66.9 %) males with mean age of 57.3 years were included. There were 38 cases in 2013, 27 – in 2014, 28 – in 2015, 37 – in 2016. 33 different serotypes were isolated, most frequently 3 (n = 28; 22.8 %), 4 (n = 23; 18.7 %), 19F (n = 11; 8.9 %), 19A (n = 8; 6.5 %), 7F (n = 7; 5.7 %). The most frequent clinical manifestations were pneumonia (70; 53.8 %), pneumonia with parapneumonic effusion and empyema (n = 29; 22.3 %) and meningoencephalitis (18; 13.8 %). The most frequent risk factors included age over 65 years (n = 39; 37.1 %), alcohol addiction (n = 37; 35.2 %), chronic heart failure (n = 23; 21.9 %). Mortality rate was 43.1% (n = 56). Serotype 3 (n = 14; 25.0 %) was the most common among 56 lethal patient cases. Isolated serotypes are covered by PCV13 in 89 (68.5 %) patients while PCV10 covered 39.2 %. From those 89 patients with isolated serotypes, which would be possible to cover by PCV13, potentially covered serotype relative increase from 63.2 % in 2013 to 70.3 % in 2016 were seen.

Conclusion. PCV13 covered serotype distribution from 2013 to 2016 showed increasing trend, including serotype 3, which was the most common among lethal patient cases, and serotype 19A. Knowledge of the serotype distribution is necessary for conjugate vaccine usage. There are reasonable considerations to review pneumococcal vaccines that are currently used in national immunization programme.
STREPTOCOCCUS PNEUMONIAE INVASIVE DISEASE

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Keywords. Invasive pneumococcal disease, statistics, serotype, neurological manifestations.

Introduction. In the past decade high lethality and growth of incidence as well as antibiotic resistance of invasive pneumococcal disease has prompted an analysis of effectiveness of immunization and treatment.

Aim. To investigate pneumococcal invasive disease incidence, methods of diagnostics, serotypes and antibacterial therapy for patients with neurological symptoms by collecting and analyzing information documented in Riga East University Hospital (REUH).

Materials and methods. Cases of Streptococcus pneumoniae invasive infection were gathered in this retrospective research by analyzing medical records of patients who were admitted to “Gailezers” centre of REUH from January 2012 to November 2017. Statistical data was processed by IBM SPSS Statistics v22 and Microsoft Excel 2013. The study was conducted in collaboration with The Centre for Disease Prevention and Control.

Results. From a total of 186 cases 33.33 % (N = 62) were women, from whom 37.10 % (N = 23) had exitus letalis, and 66.67 % (N = 124) were men, from whom 42.74 % (N = 53) had exitus letalis.

Studying the lethality rates, the highest amongst women were in age groups: 51–55, 76–80, 81–85 and 86–90 (N = 4, 26.67 %) and amongst men in age group 51–55 (N = 11, 36.67 %).

Out of total 157 cases where serotype data was available, the most frequent were type 3 (N = 36, 19.35 %), type 4 (N = 27, 14.52 %) and type 19A (N= 12, 6.45 %).

Neurological manifestations (NM) were diagnosed in 35 cases (18.82 %), which were confirmed by bacterial growth assay of Str. pneumoniae in cerebrospinal fluid (CSF) culture, gender distribution: 20 (57.14 %) men and 15 (42.86 %) women. Exitus letalis was observed in 11 cases (31.43 %) – 5 men and 6 women. Streptococcal antigen express test was administered to 27 patients, from which 25 (92.59 %) cases were positive. Ceftriaxone dose 2g twice a day was administered to all patients. The studied NM were primarily caused by serotypes 3 and 4 (N = 4, 11.43 % both).

Conclusion. It was observed that male patients had higher lethality and were generally more represented in the research, compared to female patients. The most common Str. pneumoniae serotypes were 3, 4 and 19A, which are included in pneumococcal conjugate vaccine 13 and pneumococcal polysaccharide vaccine, but type 3 and 19A are not included in pneumococcal conjugate vaccine 10. Approximately in 1/5 cases NM were observed, which was confirmed with bacterial growth assay of Str. pneumoniae in CSF culture as well as Ag express test. All patients received antibacterial therapy with Ceftriaxone.
STAPHYLOCOCCUS AUREUS CARRIAGE AND RESISTANCE TO ANTIMICROBIALS FOLLOW-UP FROM 1ST TO 5TH YEAR MEDICINE STUDENTS

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Keywords. *Staphylococcus aureus*, carriage, resistance.

**Introduction.** Medicine students interact with patients during lectures, university after hours, some of them even work as nurse assistants. It is very common to review the *S. aureus* carriage among the doctors and nurses, but there is lack of information about the carriage among medicine students.

**Aim.** Our aim was to determine whether studying medicine increases the risk of *S. aureus* carriage and to which antimicrobials isolated strains are susceptible to.

**Materials and methods.** A cohort study was conducted at Vilnius University faculty of Medicine to identify *S. aureus* carriers in 2012 (1st year) and 2017 (5th year). Nasal and pharyngeal swabs were collected and cultured on Mannitol-salt agar and blood agar. Smooth yellow mannitol fermenting colonies which were gram-positive cocci by microscopy. Staph latex agglutination test, DNase, catalase, coagulase positive were identified as *S. aureus*. After identification antibiotic resistance was evaluated using CLSI and EARSS recommendations. Susceptibility was tested for oxacillin (1 μg), cefoxitin (30 μg), rifampin (5 μg), kanamycin (30 μg), clindamycin (2 μg), erythromycin (15 μg), streptomycin (10 μg), norfloxacin (10 μg), fusidic acid (10 μg), penicillin (10 U), ciprofloxacin (5 μg) and tetracycline (30 μg), vancomycin and gentamicin. Results were analyzed using Microsoft Excel and SPSSv.20.

**Results.** In 2012 158 first year medicine students were involved in the study, after 5 years in 2017 112 fifth year medicine students stayed in the study from witch 70 (62.5%) were women and 42 (37.5%) men. After 5 years we established that *S. aureus* carriage has increased from 44.9 % to 59.5 % (p = 0.026). When comparing *S. aureus* strains(71 – 1st year and 60 – 5th year) resistance to antimicrobials we found few differences. Resistance to penicillin (66.2 % vs. 65.0 %, p = 1.00) and tetracycline (5.6 % vs. 5.0 %, p = 1.00) remained the same. Although after 5 years resistance to erythromycin has grown (0 % vs. 8.3 %, p = 0.018). There were no significant differences of resistance for oxacillin, cefoxitin, clindamycin, streptomycin, fusidic acid, ciprofloxacin, vancomycin. After 5 years, *S. aureus* strains remained susceptible to gentamicin, rifampin, kanamycin, norfloxacin.

**Conclusion.** After 5 years studying medicine *S. aureus* carriage has increased by almost 15 %. Studying medicine might be a risk factor for *S. aureus* carriage. Resistance to antimicrobials remains similar, although resistance for erythromycin has increased by 8 %. 
DETERMINATION OF AETIOLOGICAL SPECTRUM OF BACTERIAL COLONIZATION OF NEWBORN NASOGASTRIC TUBES

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Keywords. Newborn, nasogastric tube, bacterial colonization.

Introduction. Newborn in intensive care unit (NICU) are more susceptible to pathogens and at risk of developing nosocomial infections. Overall infection rates range from 8.9 to 62 infections per 1,000 patient days or 6 to 25% of the NICU population (Judith D. Polak et al., 2004). Nasogastric feeding tubes might contaminate feeds given through them due to biofilm formation. (Petersen, Greisen, Krogfelt, 2016).

Aim. To investigate the etiological spectrum and intensity of bacterial colonization of the nasogastric, relationship between bacterial colonization of the nasogastric tube and length of its insertion role of patient’s diagnosis on colonisation.

Materials and methods. The nasogastric tubes were cut with sterile scissors (1cm from the terminal and the middle part) and transported in sterile condition to the laboratory, where the bacterial suspension was obtained by sonification method. Then suspension was applied to media and colonies were identified by determining biochemical properties using commercial system VITEK2. The patient history data also were analyzed.

Results. Samples from 34 patients were taken. The cultivation results were following: Patients with newborn respiratory distress syndrome (16) – 25% S. aureus, 18.75% – negative results; 12.5% – K. oxytoca; 12.5% – K. pneumoniae; 12.5% – S. haemolyticus. In case of perinatal infection (6): 50% – S. haemolyticus; 33.3% – S. aureus; 20% – K. pneumoniae; 15.4% – K. oxytoca. In case of unspecified bacterial neonatal sepsis (4): 50% – S. haemolyticus. In case of low birth weight (12): 33.3% – S. aureus; 25% – K. oxytoca. In case of 2nd grade intraventricular non traumatic haemorrhage (7): 42% – K. pneumoniae; 28.6% – K. oxytoca; 14.3% – S. aureus; 14.3% – S. haemolyticus. Nasogastric tubes inserted for 1 day mainly were colonized by K. oxytoca, those inserted for 2 days in 30.3% were colonized by S. haemolyticus. Results in tubes deployed for 3 days varied from negative to bacteria such as E. asburiae, S. aureus, S. saprophyticus, Enterococcus spp., K. pneumoniae. After 5 days of stay in 25% of cases tubes were colonized by S. haemolyticus, in 25% – result was negative. Results after 6–10 days of insertion were following: in 66.7% of cases – S. aureus, 22.3% – K. pneumoniae, 11% – A. salmonicida.

Conclusion. High density of bacteria colonize the nasogastric tube within the first day of use. S. aureus mainly was found on the nasogastric tube with prolonged time of use, but K. oxytoca and S. haemolyticus predominated on the tubes with a short time of insertion. The nasogastric tubes with the placement time of 3–5 days had the most extensive etiological spectrum of bacteria.
THE BACTERIOLOGICAL COLONISATION OF INTUBATION TUBES IN INTENSIVE CARE UNIT

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Keywords. Nosocomial infection, bacteriological contamination, intubation tubes, intensive care unit.

Introduction. At the present time one of the most actual problem of health care system are nosocomial infections, especially high risk of them is observed in an intensive care unit (ICU). According to the European Centre for Disease Prevention and Control (ECDC) 2015 data collected from 15 European countries, 6.4 % among patients staying in an ICU for more than two days were affected by at least one episode of pneumonia, 97.4 % of them were associated with intubation.

Aim. The aim of this study is to identify microorganisms on intubation tubes from intensive care unit.

Materials and methods. The distal parts of intubation tubes from intensive care unit were sonicated for one minute at 44 kHz frequency and then were mixed for one minute by Vortex 1. The obtained bacterial suspension was cultured at the temperature at 37 °C on five types of culture medium – blood agar, mannitol salt agar, egg yolk salt agar, eosin methylene blue (Levine) agar and Sabouraud agar. The pure cultures were identified by VITEK 2 system and Latex agglutination test. Bacterial susceptibility to antibiotics was determined by Kirby-Bauer disc diffusion method.

Results. 58 intubation tubes were analyzed (37 male and 21 female), 53 (91.4 %) of them were contaminated. The average patient age was 63.2 years, the average intubation time was 6.5 days. The most frequent pathogen was A. baumanii et Iwofii (36.2 %), then S. aureus (29.3 %) and K. pneumoniae (27.6 %). Other pathogens included Pseudomonas spp. (13.8 %), Ent. faecalis et faecium (10.3 %), E. coli (8.6 %), Sphmon. paucimobilis (8.6 %), Ent. cloacae (8.6 %), B. cepacia (8.6 %) and S. haemolyticus (6.9 %). Candida spp. were detected in 27.6 % of cases. According to determined antibacterial susceptibility, in 8 of 58 cases antimicrobial therapy given in the intensive care unit was inadequate. 100 % of identified S. aureus were sensitive to all applied antibiotics, at the same time 100 % of K. pneumoniae were resistant to ampicillin but 65% of A. baumanii et Iwofii were resistant to gentamycin and 95 % – to ciprofloxacin.

Conclusion. The most frequent pathogens of this study were A. baumanii et Iwofii (65 % resistance to gentamycin and 95 % – to ciprofloxacin), MSSA (100 % sensitivity to all applied antibiotics) and K. pneumoniae (100 % resistance to ampicillin) that are considered one of the main cause of nosocomial pneumonia. The results demonstrate that intubation tube usage in the intensive care unit can be an important potential risk factor for developing nosocomial pneumonia.
DETERMINANTS OF IMMUNOLOGICAL STATUS IN PATIENTS UNDERGOING CARDIAC SURGERY

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Keywords. Immunological status, determinants, surgery.

Introduction. Substantial part of patients undergoing cardiac surgery is cachectic and therefore immunocompromised.

Aim. To explore possible determinants of immunological status (IS) in patients undergoing cardiac surgery.

Methods. This observational study included patients, who underwent elective cardiac surgery. Demographics, co-morbidities and lab data were gathered before the surgery. To evaluate the IS a flow cytometry was used, providing counts of various lymphocytes: CD4, CD8 and CD3. Linear regression analysis with forward selection process was used to determine the predictors of lymphocyte counts. Statistical analysis was performed with IBM SPSS statistics v22.

Results. Data were gathered of 55 patients, half of them were men 50.9% (n = 28). The surgical procedures performed were low risk with a median EuroSCORE II value of 1.75 (1.5–2.2), most of them CABG 63.6% (n = 35). Median values of lymphocytes were as follows: CD3 (1130.0 (834.2–1711.4) units/mm³), CD4 (763.3 (546.9–1048.1) units/mm³), and CD8 (398.8 (240.1–561.2) units/mm³). Regression analysis revealed determinants of log10 lymphocyte counts, for CD3 cells age (B = (−)0.023 CI95 %: (−)0.4–(−)0.01 p= 0.005) and smoking (B = 0.39 CI95 %: 0.060.71 p = 0.022); for CD4 cells age (B= (−)0.022 CI95 %: (−)0.04–(−)0.01 p = 0.015); and for CD8 cells: age (B = (−)0.024 CI95 %: (−)0.04–(−)0.01 p = 0.017), smoking (B = 0.571 CI95 %: 0.17–0.97 p = 0.008) and COPD (B = 0.30 CI95 %: 0.01–0.59 p = 0.044).

Conclusion. Patients undergoing cardiac surgery have highly variable counts of lymphocytes, indicating a dynamic provenance of IS. We report age, smoking and COPD as predictors of IS in cardiac surgery. Larger trials are needed to exclude the variability in the present study.
PREVALENCE AND RISK FACTORS OF HEPATIC STEATOSIS IN HEPATITIS C VIRUS INFECTED PERSONS

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Keywords. Hepatitis C virus, hepatic steatosis, prevalence.

Introduction. There are 130–170 million people infected with hepatitis C virus (HCV) worldwide. Approximately 80% of infected with HCV develop chronic viral hepatitis, which can progress to liver fibrosis, cirrhosis and hepatocellular carcinoma. Hepatic steatosis in HCV patients is associated with the progression of disease. It is prevalent in chronic hepatitis C due to a combination of some viral and host factors such as overweight, insulin resistance, diabetes mellitus, HIV coinfection or alcohol consumption. In the era of direct-acting antivirals, the sequelae of hepatic steatosis and its drivers warrants more attention.

Aim. The aim of this study was to evaluate the prevalence and risk factors of hepatic steatosis in chronic hepatitis C patients.

Materials and methods. The case records of 221 chronic hepatitis C patients with liver biopsy performed in University hospital Santaros Clinics Centre of Infectious diseases in 2015–2017 were studied. The demographical, epidemiological data, liver enzyme activity, coagulogram, platelet count, total bilirubin, histological evaluation of liver biopsy, virus genotype were evaluated. The variables were compared between patients with or without hepatic steatosis in liver biopsies. The nominal variables were compared with Chi–square test and scale variables means were compared with independent sample T–Test. The risk factors of steatosis were evaluated by Logistic regression binary analysis backward LR method. Statistical analysis was performed with SPSS v20.

Results. Hepatic steatosis was confirmed histologically in 122 (55.2%) of the patients. It was significantly (p < 0.05) more prevalent in obese patients, those who had blood transfusion before 1993 and those with genotype 3a. Patients with hepatic steatosis had statistically significant (p < 0.05) higher numbers of liver enzymes and activated partial thromboplastin time (APTT) in blood serum together with hepatic activity index (HAI) 7 or higher in liver biopsies. The logistic regression analysis confirmed body mass index, blood transfusion before 1993, APTT, HAI 7 and higher, HCV genotype 3a as risk factors for steatosis.

Conclusion. Hepatic steatosis was found in more than a half of chronic hepatitis C patients. It was associated with some host factors like obesity or a possible route of infection through blood transfusion, and viral factors like genotype 3a.
EFFECTIVENESS OF DIRECT-ACTING ANTIVIRAL TREATMENT IN HEPATITIS C-INFECTED PATIENTS AFTER LIVER TRANSPLANTATION

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Keywords. HCV, DAA therapy, liver transplantation.

Introduction. Liver cirrhosis associated with HCV (hepatitis C virus) infection is the most common cause of liver transplantation in the world. The relapse of infection after transplantation is usually immediate and its frequency is 95%. Previous treatment of HCV infection after liver transplantation with interferon-based regimens was ineffective in most cases.

Aim. The aim of the study was to evaluate the effectiveness of DAA (new direct-acting antiviral) therapy in a large group of patients with HCV recurrence after liver transplantation.

Material and methods. 43 women and 77 men were included into a prospective study; with genotype 1–110, genotype 3–7 and genotype 4–4 patients. Mean age of the patients was 54 (19–72) years, and mean time from liver transplantation was 97 (36–315) months. Before treatment patients underwent liver biopsy and elastography. Biochemical tests and HCV viremia tested by reverse transcriptase-polymerase chain reaction (RT-PCR) were performed before, during and 4, 12 and 24 weeks after completion of treatment. In the group with genotype 1, treatment with sofosbuvir/ledipasvir (SOF/LED) and ribavirin (RBV) received 102 patients, paritaprevir/ritonavir/ombitasvir (PTV/r/OMV) with dasabuvir (DSV) and RBV 8 patients. All patients with genotype 3 were treated with SOF and RBV, and with genotype 4 PTV/r/OMV and RBV.

Results. The efficacy of treatment (sustained virologic response – SVR12) in the group with genotype 1 was 98%, and in the group with genotype 4–100%. In the group with genotype 3, 2 patients had a recurrence of viremia after treatment. The most common complication during treatment was RBV dose-dependent haemolytic anemia, in some cases requiring blood transfusion. 3 patients treated with 3D (PTV/r/OMV with DSV) and RBV experienced worsening of renal function requiring dialysis in 2 of them. Hepatocellular carcinoma (HCC) relapsed in 4 patients with HCC history.

Conclusion. The effectiveness of HCV treatment after liver transplantation with the presented drug regimens is very high for genotypes 1 and 4, however, in case of genotype 3, treatment with sofosbuvir and ribavirin is ineffective and should not be used. The advancement of liver fibrosis and the moment of achieving a negative viremia during treatment does not affect the efficacy of therapy. Treatment is very well tolerated and free from serious side effects.
HEALTHCARE WORKERS AND MEDICAL STUDENTS ATTITUDE TOWARD VACCINATION AGAINST A AND B HEPATITIS IN LATVIA

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Keywords. Hepatitis, vaccinations.

Introduction. The viral hepatitis is one of the most common groups of infection diseases worldwide. In 2017 worldwide was 240 million cases of chronic hepatitis B. In 2017 in Latvia there were 332 cases of chronic hepatitis B and 66 cases of acute hepatitis A that is 10 times more than in 2016. According to the WHO in 2015 has been registered 887000 deaths associated with chronic B hepatitis. The biggest part of viral hepatitis can be successfully prevented by timely vaccination.

Aim. The aim of our study is to get a healthcare providers and medical students attitude toward vaccination against A and B hepatitis. Also to investigate the most common reasons of vaccination or not vaccination against B and A hepatitis.

Materials and methods. We used standardized survey to establish medical providers and medical students attitude toward vaccination against B and A hepatitis. Statistic data has been processed in Microsoft Excel and SPSS. The Pearson correlation test has been used to establish correlation between study year and vaccination against A and B hepatitis.

Results. In our study we have included RSU faculty students and healthcare workers from biggest hospitals in Riga. Male female ratio was 1 to 9 with age group from 18 to 58 years. 83.6% was medicine students, 15.1% was healthcare workers and 1.3% was no connection with medicine. Average 69% (CI 95% 63.3–74.7%) of medicine faculty student have vaccination against B hepatitis and 23% (CI 95% 17.4–28.6%) against A hepatitis. Only 15% first year medicine students have vaccination against B hepatitis and 25% against A hepatitis, 44% and 25% of second year respectively, 62% and 41% of third year respectively. 85% of fourth year, 88% and 38% of fifth year respectively, 95% and 31% of sixth year respectively. 93% of healthcare providers have vaccination against B hepatitis (CI 95% 89.3–96.7%) and only 43% have vaccination against A hepatitis (CI 95% 35.3–50.7%). Most common cause for vaccination medicine students declare – vaccination is most effective way to protect against illness 51% (CI 95% 44.1–57.9%) afraid of infection risk at work 28% (CI 95% 22.6–33.4%). Most common cause for vaccination healthcare providers declare – vaccination is most effective way to protect against illness 33%, afraid of infection risk at work 30%, 24% said it was requirement at work.

Conclusion. In our study we find direct correlation between study year and vaccination against B hepatitis ($R_{0.8075}$), also we find weak correlation between study year and vaccination against A hepatitis ($R_{0.489}$). Mostly medicine workers and students do not have vaccination against A hepatitis.
ASSOCIATION BETWEEN PLASMA INTERLEUKIN-18 LEVEL AND A NEGATIVE OUTCOME IN HIV-1/TB PATIENTS

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Keywords. Interleukin-18, HIV-1/TB, outcome.

Introduction. HIV-associated tuberculosis (HIV-1/TB) is one of the most common opportunistic infections, affecting about one third of HIV-1 patients. Both infections provoke increasing level of interleukin-18 (IL-18) in plasma. It was found that IL-18 level can be a biomarker of tuberculosis-associated immune reconstitution inflammatory syndrome (IRIS). IL-18 is also weakly and negatively correlated with negative outcome in HIV-1/TB patients. A concrete level of IL-18 associated with negative outcome is a question for this study.

Aim. To assess the association between the level of IL-18 in plasma and a negative outcome in HIV-1/TB patients.

Materials and method. Retrospective study, is based on 2 indicators (IL-18 level and a negative disease outcome on the fixed date) from the doctoral study of the supervisor. The sample included 158 patients aged 23 to 59 years with HIV-1 infection and confirmed tuberculosis (46 women and 112 men).

IL-18 level was detected by ELISA method. IL-18 reagent kits were used according to the methodology of the manufacturer. Among participants, 33 patients (21%) had deceased due to tuberculosis or other complications caused by HIV-1.

Chi-square test was used for the assessment of the association between the level of IL-18 and the outcome. A 2 (level of IL-18) × 2 (outcome) contingency table was created at three IL-18 levels: 1) norm level (lower or higher than 260 pg/μl); 2) norm level × 2 (lower or higher than 520 pg/μl); 3) norm level × 3 (lower or higher than 780 pg/μl). Calculations were performed online at http://www.quantpsy.org/chisq/chisq.htm.

Results. There was no significant association between the level of IL-18 and negative outcome at the first two levels (260 pg/μl and 520 pg/μl). A significant association was detected at the level of 780 pg/μl, $\chi^2(1) = 7.06$, $p = 0.01$. Among deceased patients 42.4% had IL-18 level higher than 780 pg/μl. Among alive patients only 20% had the IL-18 level higher than 780 pg/μl.

Conclusion. The higher level of IL-18 is associated with a negative outcome. Based on the research IL-18 levels can be recommended for the assessment of patient’s risk of death.
PULMONARY AND PLEURAL MANIFESTATIONS OF HIV INFECTION IN RIGA EAST CLINICAL UNIVERSITY HOSPITAL CENTRE OF TUBERCULOSIS AND LUNG DISEASES

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Keywords. HIV, tuberculosis, pulmonary, pleural manifestations.

Introduction. Since first descriptions of HIV/AIDS in 1981, the respiratory tract has been most commonly affected site accounting up to 70% of all HIV infected individuals worldwide, mainly due to infectious aetiology such as tuberculosis and other infections (Pneumocystis jirovecii, bacterial pneumonias). Hence, investigation of CD4+ T-lymphocyte (CD4+) level and associated distribution of pulmonary and pleural manifestations (PPM) could contribute to improving the treatment options.

Aim. To evaluate PPM of HIV infection, associations between patients’ CD4+ level and the PPM and prevalence of prior highly active antiretroviral therapy (HAART) use.

Materials and methods. Medical records of all HIV infected patients admitted to Riga East Clinical University Hospital Centre of Tuberculosis and Lung Diseases from January 2012 to October 2017 were retrospectively analyzed. Statistical data was processed by IBM SPSS Statistics v23.

Results. Out of total 201 cases 88.1% (N = 177) had PPM, gender distribution: 73.4% (N = 130) males, median age = 38 (IQR, 32–43), range 1–74 years, and 26.6% (N = 47) females, median age 35 (IQR, 32–43), range 25–67 years. Mann–Whitney test did not show any statistically significant difference in gender median age (U = 2773.5, Z = −0.936, p = 0.349). Only 14.7% (N = 26) of patients with PPM had regular HAART (p < 0.001).

In total 215 PPM were identified with the most common being: 53.0% (N = 114) drug-susceptible pulmonary tuberculosis, 12.1% (N = 26) multidrug-resistant pulmonary tuberculosis, 12.1% (N = 26) unspecified pneumonia, 10.2% (N = 22) parapneumonic pleural effusion and/or empyema thoracis and 4.7% (N = 10) tuberculous pleurisy. At the moment of PPM 94.0% (N = 142) of patients with known CD4+ level presented with ≤ 500 cells/mm³, while 88.1% (N = 133) had ≤ 350 cells/mm³. One-sample Kolmogorov–Smirnov test showed that there is a statistically significant relationship between CD4+ level ≤ 350 cells/mm³ and PPM frequency (p < 0.001).

Conclusion. Our study results show that most patients with PPM had no regular HAART. More than half of patients presented with laboratory confirmed, predominantly drug-susceptible pulmonary tuberculosis. Most PPM were diagnosed at a CD4+ level ≤ 350 cells/mm³, which indicates that, despite evident progress in diagnostic and treatment aspects of HIV infection in Latvia, we still struggle with timely diagnosis and patients’ adherence to therapy.
EXTRAPULMONARY MANIFESTATIONS OF HIV INFECTION 
IN RIGA EAST UNIVERSITY HOSPITAL CLINICAL CENTRE 
OF TUBERCULOSIS AND LUNG DISEASES

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Keywords. HIV, AIDS, extrapulmonary manifestations.

Introduction. AIDS stage of HIV infection is characterized by opportunistic infections (OIs) that manifest in different organ systems of the human body. Nowadays HIV still remains a challenge for public health as to the 1st October 2017 a total of 7189 HIV cases were recorded in Latvia, of which 1879 (26.1 %) were already in the AIDS stage. Effective treatment and patient adherence to therapy plays a major role in minimizing the risk of OIs and other manifestations of HIV infection in these patients.

Aim. To investigate HIV infection extrapulmonary manifestations (EPM), CD4+ T-ly level at time of diagnosis of the manifestations and prevalence of regular prior highly active antiretroviral therapy (HAART) use.

Materials and methods. Cases were gathered in retrospective research by examining medical records of all HIV infected patients who were admitted to the Centre of Tuberculosis and Lung Diseases from January 2012 to October of 2017. Statistical data was processed by IBM SPSS Statistics v23.

Results. From a total of 201 cases of HIV infection 117 (58 %) had EPM, of which 83 (71 %) were men with a median age of 38 years (IQR, 32–44) and 34 (29 %) women with a median age of 35 years (IQR, 30.25–40.5) with no significant difference between the age median values (p = 0.152). Only 12 % of patients had at least 3-month prior HAART (p < 0.001).

A total of 140 gastrointestinal manifestations were present in 64 % of patients with EPM and the most common were candidiasis (21 %) and intestinal tuberculosis (14 %). A total of 40 neurological manifestations were present in 29 % of patients and the most common were encephalopathy (25 %), polyneuropathy (18 %) and meningitis (13 %). A total of 20 urogenital manifestations were present in 17 % of patients with the most common being urinary tract tuberculosis (68 %). A total of 22 dermatological manifestations were present in 19 % of patients and the most common were dermatitis (27 %) and herpes zoster (14 %). Septic complications manifested in 3 % of patients.

The majority (93 %) of the most common EPM were diagnosed at a CD4+ T-ly level ≤ 350 cells/mm³ (p < 0.001).

Conclusions. Most HIV infected patients with EPM did not use regular HAART. The most common EPM were gastrointestinal and neurological. The majority of the most common EPM were diagnosed at a CD4+ T-ly level ≤ 350 cells/mm³. Despite progress in diagnosis and treatment, wider use of HAART and a greater patient adherence to therapy is needed to effectively manage HIV infection.
HIV POSITIVE PREGNANT WOMEN CORRELATION IN 2016

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Keywords. HIV positive; pregnant women.

Introduction. HIV infection is a real problem in Latvia. In 2016, Latvia had the biggest registered new cases of HIV infection comparing with other Baltic countries. In 2016, Latvia have been registered 67 pregnant women with HIV positive infection. Woman shouldn’t think only about her health, but also about her future baby, which don’t have choice at this very moment.

Aim. To understand, have these women changed their attitude to their disease and use their medication as a doctor appointed, when they are expecting a baby, or they don’t want to treat themselves and future baby. Also, in research attention will be paid–If newborn has infected by mom; Frequent reason for the change of treatment; Frequent reasons of infection.

Materials and methods. In research are used histories of disease–HIV positive women, which were pregnant in 2016, and their newborns, which were born in 2016; their laboratory analyses results.

Results. About 48% pregnant women discover, that they have HIV during pregnancy, 10% of them took pills irregularly, but 90% took pills on time. 52% pregnant women have known about their diagnoses before: 39% – irregularly or did not take pills at all before, during and after pregnancy; 26% – pregnant women always used medication on time; 12% – discover the disease during pregnancy, but took pills irregularly or didn’t took them at all; 12% – took pills before pregnancy irregularly, but during pregnancy and after it took on time; 11% – before and after pregnancy didn’t took pills or took them irregularly, but during pregnancy took them on time. After having analyzed all histories, it became clear, that all newborns are HIV negative. Also, became known, that 10% of newborns have positive analyses about hepatitis B, 8% have hepatitis C, and 3% have hepatitis B and C together. One baby was born before the term and died in few days; one woman had spontaneous abortion–baby died in womb. The most popular reason of treatment changing (85%) – to take fewer pills. Doctor do it, to make woman life more comfortable or to rise a correlation. However, only in 25% cases, doctor change treatment due to side effects. In 75% the reason of infection is sex with HIV positive man, 12% – inconstant sex partners. 6% of women has infected during the use of drug. Only 2% of pregnant women can’t clarify the possible way of infection. 5% of young moms noted, that they have two or more possible infection ways.

Conclusion. Despite, there is a high percent of pregnant women, which took pills irregularly or don’t took them, most pregnant women took pills on time and did all, not to infect their newborns. It is very difficult to tell, why there is so big difference between women, but as for me–it is a good idea for a new research.
PREVALENCE OF HOSPITAL PNEUMONIA CAUSED
BY ANTIBIOTICS RESISTANT MICROORGANISMS
IN DIFFERENT INTENSIVE CARE UNITS

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Keywords. Resistance, antibiotics, hospital.

Introduction. Hospital pneumonia (HP) is lower respiratory tract infectious disease, which is diagnosed when pneumonia symptoms are diagnosed after 48 hours after being hospitalized. Hospitalized pneumonia in the intensive care unit is associated with high rates of morbidity and mortality due to the critical state of patients and the high prevalence of antibiotic-resistant microorganisms in hospitals.

Aim. The aim of this research was to evaluate the prevailing aetiology of hospital pneumonia in the LSMU KK Cardiac Surgery and Central intensive care units. Also, compare the antibiotic resistance of the most commonly occurring pathogens of hospital pneumonia in different intensive care units.

Materials and methods. This study was carried out at LSMU KK Cardiac Surgery and Central intensive care units ICU. For the analysis, 1009 patients were retrospectively selected, for whom in 2015–2016 hospital pneumonia was diagnosed.

Results. The most common microorganisms causing HP in the Central and Cardiosurgical ICU were Enterobacteriaceae spp. 30.23 % and 38.42 % respectively, Acinetobacter spp. 20.04 % and 15.7 %, Pseudomonas aeruginosa 11.81 % and 21.57 %. Antimicrobial resistance in central ICU was identified: Enterobacteriaceae spp. resistance was Cefuroxime 46.6 %, Cefotaxis 34.5 %, Ciprofloxacin 28.2 %; Acinetobacter spp. – Ciprofloxacin 94.9 %, Meropenem 90.8 %, Imipenem 90.8 %; Pseudomonas aeruginosa – Ciprofloxacin 15.7 %, Gentamicin 9.8 %, Amikacin 5.9 %. Antimicrobial resistance was evaluated in the cardiac surgery ICU as well: Enterobacteriaceae spp. – Cefuroxime 54.8 %, Cefotaxis 37.6 %, Ciprofloxacin 33.3 %; Acinetobacter spp. – Ciprofloxacin 100 %, Meropenem 92.1 %, Imipenem 92.1 %; Pseudomonas aeruginosa – Gentamicin 10.5 %, Ciprofloxacin 7.0 %, Amikacin 7.0 %.

Conclusion. The prevailing hospital pneumonia agents in the Central and Cardiac Surgery intensive care units are Enterobacteriaceae spp., Acinetobacter spp., Pseudomonas aeruginosa. Enterobacteriaceae spp. was quite sensitive to most antibiotics tested. It was found that in the Central Intensive Care Unit P. aeruginosa was most resistant to ciprofloxacin (15.7 %), while in the Department of Cardiothoracic Surgery it was most resistant to Gentamicin (10.5 % of cases), but overall it was susceptible to most antibiotics. Acinetobacter spp. HP causative agents have been resistant to most antibiotics irrespective in which section of the intensive care unit hospital pneumonia HP was diagnosed.
COMPREHENSIVE STUDY OF FATAL PNEUMONIA USING AUTOPSY RECORDS

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Keywords. Fatal pneumonia, HIV, autopsy records.

Introduction. Modern medicine has helped lower the incidence of deaths caused by pneumonia. However, it makes up 25% of the respiratory diseases that are responsible for the third most common cause of death in developed countries. In the EU, 78 deaths per 100,000 occur due to respiratory diseases. It can be more serious and life-threatening in young children, people 65 years or older, individuals with chronic health problems, and those with a weakened immune system i.e. HIV positive patients (Afessa et al., 1998). It is a common cause of mortality and morbidity in HIV-infected population (Head et al., 2017).

Aim. To analyze the spectrum of fatal pneumonia in patients in hospitals and at home, using pathology records.

Materials and methods. Fatal pneumonia cases were analyzed and categorized as following: pneumonia as primary pathology, complication or concomitant at the time of death. The relationship between HIV related deaths and pneumonia was also explored. The study is done in Pathology Centre, Riga East Clinical University Hospital, with 93 autopsy cases, using pathology department records to evaluate the role of pneumonia in the patient’s death. We also analysed microscopic pictures of lung pathology specimens stained with haematoxylin eosin using a light microscope. Results are analysed using Excel.

Results. Pneumonia as a main pathology n = 30, of which 77% males (♂) (3.3♂ : 1♀). Average age in this group is 60 years and the most patients presented with bilateral lobar pneumonia. Klebsiella pneumoniae was a common etiological agent. In 63% of patients, cardiovascular diseases were present as co-morbidities, including atherosclerosis of large arteries and history of myocardial infraction.

Pneumonia as a complication n = 44, of which 64% males (1.6♂ : 1♀) and average age of 48.9. Majority of patients presented with bilateral bronchopneumonia caused by Pneumocystis jirovecii and Cryptococcus. Greatest number of days spent in hospital was in this category (average of 17 days). 66% (n = 29) were HIV patients.

Pneumonia as a concomitant disease n = 19, of which 61% males (1.6♂ : 1♀) and average age of 64. Patients presented with bronchopneumonia (n = 6) and hypostatic pneumonia (n = 7). Pneumonia as a main pathology and concomitant had 26% of patients with home deaths. In total, there were n = 8 (6%) of missed diagnosis in clinics, of pneumonia.

Conclusion. In conclusion, pneumonia as a main pathology is seen in patients in the 7th decade with multiple life limiting diseases especially cardiovascular pathology. HIV cases were characterized by patients with average age 48.9, who spent the longest in hospital. Lastly, pneumonia affected mainly males in all categories. Pneumonia is a very complex disease that has a variety of manifestations, which depend on patient age, sex, immunological status and other lifestyle factors.
DISTRIBUTION AND CLINICAL ASPECTS OF EARS-NET CONTROLLED SEPSIS ISOLATES IN RIGA EAST UNIVERSITY HOSPITAL, YEAR 2016

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Keywords. Sepsis, EARS-Net, primary site, PCV13, PPV23.

Introduction. Since 2004 Latvia participates in European Antimicrobial Resistance Surveillance Network (EARS-Net) reporting eight most common human invasive bacterial pathogens and their antimicrobial resistance (E. coli, K. pneumoniae, P. aeruginosa, Acinetobacter sp., S. pneumoniae, S. aureus, E. faecalis and E. faecium). As a result of pathogen invasion into bloodstream and the following organism’s reaction to it sepsis represents the majority of EARS-Net controlled bacterial infections.

Aim. To examine the distribution of EARS-Net controlled invasive isolates, define the possible primary sources of sepsis, the most common isolates and case fatality rates in each of them.

Materials and methods. Medical records of all sepsis and septic shock cases caused by EARS-Net controlled isolates registered in Riga East Clinical University Hospital clinical centres from January to December 2016 were retrospectively analyzed. Statistical data was processed by IBM SPSS Statistics v23.

Results. Out of total 263 cases 49.8% (N = 131) were men, median age= 65 (IQR, 51–72), range 24–91 years, and 50.2% (N = 132) were women, median age = 70 (IQR, 55.5–79.75), range 21–93 years, with a statistically significant difference in gender median age (U = 7219.5, Z = −2.313, p = 0.021). A total of 281 isolates were identified with the most common being: 28.5% (N = 80) E. coli, 26.0% (N = 73) S. aureus, 12.1% (N = 34) S. pneumoniae (70.6% (N = 24) pneumococcal conjugate vaccine 13 (PCV13) and 85.3% (N = 29) pneumococcal polysaccharide vaccine (PPV23) serotypes) and 11.0% (N = 31) K. pneumoniae.

The most commonly found primary sites of infection were urosepsis (24.7%, N = 66, predominant isolate E. coli (71.2%, N = 47, p < 0.001)), pneumonia (24.3%, N = 65, primarily S. pneumoniae (43.1%, N= 28, p<0.001)) and intra-abdominal pathologies (13.5%, N = 36, predominantly E. coli (55.6%, N = 20, p<0.001)) with case fatality rates 24.2% (N = 16), 60.0% (N = 39) and 38.9% (N = 14) respectively. There was a statistically significant effect of primary site of infection (lambda = 0.183, p = 0.04) as well as patient’s age (U = 6893.0, Z = -2.280, p = 0.023) on the outcome.

Conclusion. Our study indicates that the predominant EARS-Net controlled invasive isolates confirmed were E. coli, S. aureus and mostly vaccine-preventable S. pneumoniae serotypes with urosepsis, pneumonia and intra-abdominal pathologies covering more than half of all primary sites. Primary site and patient’s age were determined as independent possible prognostic factors for sepsis outcome.
INFECTION PARAMETERS AND RISK OF EARLY-ONSET SEPSIS IN NEWBORNS

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Keywords. Early onset sepsis calculator, C-reactive protein, leucocyte count.

Introduction. Early-onset sepsis continues to pose a challenge in diagnostics and treatment because of low specificity clinical and infection parameters. This leads to serious antimicrobial over-treatment in newborns. Quantitative risk estimation tool like the early-onset neonatal sepsis (EOS) calculator is promising, but it is not clear how it associates with infection parameters in the first 72 hours of life.

Aim. The aim of this study is to evaluate the hypothesis that higher EOS calculator results are associated with laboratory infection parameters, in particular an increase in C-reactive protein (CRP) and leukocyte counts within 72 hours after birth.

Subjects and Methods. In a retrospective study data was obtained from medical records in Riga Maternity Hospital. Infants born ≥ 34 weeks of gestation who were started on antibiotic treatment for suspected EOS within 72 hours after birth were included. EOS risk groups were determined using 5 major risk factors. EOS risk estimates were retrospectively compared to available laboratory infection parameters, including CRP and leucocyte count. Statistical analysis was performed using MS Excel, IMB SPSS Statistics 22 software and p < 0.05 was considered statistically significant. Data was tested for normality using Shapiro-Wilk test. Kruskal–Wallis and Mann–Whitney U-tests were applied to differences between stratified risk groups.

Results. A total of 205 newborns were included in the study. There were 163 (79.5%) infants in the low risk group, 16 (7.8%) in the intermediate and 26 (12.7%) in the high risk group. There was a statistically significant negative correlation between EOS risk and CRP level. In the low risk group CRP level was significantly higher (20.5 mg/l; IQR 9.5–32.1) than in the intermediate (0.1 mg/l; IQR 0.1–1.2) and high (0.2 mg/l; IQR 0.1–3.4) risk group (p < 0.05). There were no statistically significant differences in the leucocyte count between these groups.

Conclusion. In contrast to the hypothesis, high EOS risk at birth was correlated with lower CRP levels. Leukocyte count did not show significant association with risk groups. Further interpretation of infection parameters during sepsis calculator use needs to be elucidated.
MOLECULAR IDENTIFICATION OF BABESIA CANIS CANIS IN LATVIAN DOMESTIC DOGS AND RELATIONSHIP BETWEEN B. CANIS GENOTYPE AND CLINICAL MANIFESTATIONS

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Keywords. Babesia canis, tick-borne diseases, canine babesiosis.

Introduction. Canine babesiosis is an infectious tick-borne disease caused by various species of Babesia, an intraerythrocytic protozoa. Common findings are thrombocytopenia and haemolytic anaemia, and clinical disease varies from mild to severe. Severity of infection is determined by multiple factors such as immunologic response, splenectomy, co-infections and pathogen species. Recently, the significance of Babesia genotypes was also pointed out. First cases of canine babesiosis in Latvia were reported in 2013; since then there have been several reports on B. canis canis infected ticks and clinical cases in Baltic States.

Aim. The aim was to detect and to genotype Babesia protozoans in clinical samples of dogs in Latvia using molecular methods, and to analyse clinical features of canine babesiosis in the context with pathogen’s genotype.

Materials and methods. DNA was isolated form 127 clinical samples received from veterinarians in years 2016–2017. PCR of 18S rRNA gene was performed to detect Babesia positive samples. 18S rRNA gene sequencing was used to confirm Babesia species and genotype. PCR product cloning in E. coli followed by colony PCR and sequencing was used for discrimination of mixed samples. MEGA6, FinchTV and BLAST programmes were used for sequence analysis. Clinical features of Babesia-positive cases were extracted from clinical forms filled by veterinarians.

Results. 27 clinical samples were Babesia-positive, B. canis canis was identified in all cases. The genotypes were distinguished on the basis on two nucleotide (GA → AG) substitutions in 18S rRNA gene sequences at positions 610/611. GA genotype was detected in 4 samples (14.8%) and mixed genotype, i.e. sequences displayed A/G double peaks at those positions, was observed in 23 cases (85.2%). Molecular cloning confirmed the presence of both, i.e. GA and AG, alleles in the clinical sample of mixed genotype.

Clinical data were available for 16 Babesia-positive dogs. Clinical manifestations ranged from subclinical infection (1 case) to fatal (3 cases). Symptoms conformed to literature – increased body temperature, lethargy, weakness, anorexia, tachycardia, difficulties in breathing, anaemia and thrombocytopenia, discolouration of faeces and urine. B. canis canis 18S rRNA genotypes did not associate with clinical form of disease in this study.

Conclusion. Our study confirmed the occurrence of canine babesiosis in Latvia within the two-year period. B. canis canis 18S rRNA gene typing does not appear to be important for interpretation of clinical manifestations; however, pathogen species identification could be useful to identify outbreaks of infections.

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HEALTHCARE-ASSOCIATED INFECTIONS CAUSED BY ACINETOBACTER BAUMANNII IN RIGA EAST CLINICAL UNIVERSITY HOSPITAL

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Keywords. Acinetobacter baumannii, healthcare-associated infection (HCAI).

Introduction. The epidemiological situation in Riga East University Hospital has worsened in the past years, it has been reported that there has been an increased spread of A. baumannii resistance, the cause of serious infections in healthcare. Acinetobacter spp. are gram-negative, aerobic non-motile; opportunistic microorganisms. A. baumannii is very well adapted in a healthcare setting and is difficult to eradicate once it has become endemic.

Aim. To review healthcare – associated infections caused by A. baumannii.

Materials and methods. This study was conducted in Riga East University Hospital during 2015–2016 year period. The selection group included patients with microbiologically confirmed A. baumannii presence, who certain antimicrobial sensitivity profile against: Ciprofloxacin, Piperacillin/Tazobactam, Ampicillin/Sulbactam, Ceftazidim, Imipinem, Meropenem, Gentamicin, Amikacin, and Colistin. Antibiotic susceptibility testing was done by VITEK 2 system. The patients’ medical records were analysed clarifying the acquisition risks, clinical manifestations and evaluated colonization/infection ratio expression. A. baumannii related infections were confirmed on the basis of case definitions of HCAI ECDC (European Centre for Disease Prevention and Control) technical document.

Results. We observed 65 patient histories where A. baumannii microbiologically was confirmed. 11 (17 %) patients were found to have Carbapenem-resistant (CRAB), 52 (80 %) – Extensively-drug resistant(XDR) or Combined (fluoroquinolones, aminoglycosides and carbapenems) resistance and 2 (3 %) absolutely sensitive A. baumannii. 42 cases (64.6 %) were colonisations/contaminations, 23 (35.4 %) were A. baumannii caused infections. All infections were treated with Colistin or Amikacin depending on the resistance. 4 colonisations were treated with Colistin. 26 (40 %) patients died with laboratory confirmed A. baumannii.

Conclusion. A. baumannii is an important opportunistic and emerging pathogen that can lead to serious healthcare-associated infections. Most cases (80 %) were confirmed as A. baumannii with combined resistance (according to ECDC Surveillance atlas 67.2 %). A. baumannii remains a microbe with high mortality rate. It is crucial to distinguish colonisation from infection, so that we can avoid unnecessary antibiotic treatment. So in the future it will be possible to decrease, the selective pressure of A. baumannii therefore preventing it from becoming panresistant. A. baumannii colonisation can lead to further infections, thus the prevention of the transmission of XDR A. baumannii in hospitals is very important.
IDENTIFICATION OF BORRELLIA SPECIES CO-INFECTIONS IN IXODES RICINUS AND IXODES PERSULCATUS TICKS IN LATVIA

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Keywords. Borrelia burgdorferi sensu lato, Borrelia miyamotoi, co-infections, Ixodes ticks.

Introduction. Lyme disease is a tick-born infection, which is caused by spirochetes of Borrelia burgdorferi sensu lato group that includes several Borrelia species. In Latvia, Lyme disease is transmitted by two epidemiologically significant tick species: Ixodes ricinus and Ixodes persulcatus. On average, 600 cases of Lyme disease were reported in Latvia each year (SPKC, 2011–2015). Ixodes ticks are able to transmit a large number of bacteria, viruses and parasites, and may also be co-infected with several Borrelia species. This co-infection may alter the progression of Lyme disease as well as symptom severity in mammals. Currently, only few data exist regarding co-infection prevalence in Latvia.

Aim. To identify possible co-infections of Borrelia species and their prevalence in Ixodes ricinus and Ixodes persulcatus ticks from biotopes of different Latvian regions.

Materials and methods. DNA from 1472 ticks was extracted and 16S rRNA gene fragment was amplified by PCR reaction using universal primers for Borrelia species. All positive samples were sequenced by Sanger method for species differentiation. Samples that were suspected of having a co-infection were cloned in E. coli, followed by colony PCR and sequencing. Sequences were analyzed using BLAST program and databases to determine Borrelia species. Acquired data were processed in Microsoft Exel 2016. Available scientific literature and publications (PubMed and Scopus databases) have been studied.

Results. During a two-year period (2005–2007), 1472 ticks were collected from 5 Latvian regions: Vidzeme (577), Latgale (378), Zemgale (192), Kurzeme (105), Riga and its surroundings (220). In total, 38.6% (568/1472) ticks were positive for Borrelia species, and 4.2% (62/1472) had co-infection. The most common combination was B. afzelii with B. garinii, and it was found in 3.1% of ticks (46/1472). In 5 tick samples (0.3%) B. garinii and B. valaisiana co-infection has been identified.

In this study, the presence of Borrelia miyamotoi, species that is closely related to the bacteria that cause tick-borne relapsing fever, has also been identified. B. miyamotoi mono-infection has been detected in 20 cases (1.4%), while co-infection with B. afzelii and B. garinii was found in 8 cases (0.5%) and in 3 cases (0.2%), respectively. Triple infection (B. afzelii, B. garinii, B. miyamotoi) has also been detected in one tick (0.1%) from Vidzeme region.

Conclusion. Different combinations of Borrelia species in co-infected Ixodes ticks were found in Latvia. Importantly, co-infection with B. miyamotoi was detected in the field-collected Latvian ticks. Further studies are needed to determine whether B. burgdorferi sensu lato group and B. miyamotoi co-infection influences the outcome of disease in humans.

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SEROPREVALENCE OF TOXOPLASMA GONDII INFECTION IN LATVIA DURING PERIOD OF 2012–2016

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Keywords. Toxoplasma gondii, seroprevalence, general population.

Introduction. Toxoplasma gondii is a protozoan which is an agent of toxoplasmosis infection. The toxoplasmosis symptoms exist in only 20 % of cases in immunocompetent patient. The diagnosis of toxoplasmosis is typically made by serologic testing. Immunoglobulin G (IgG) is used to determine if a person has been infected and immunoglobulin M (IgM) is used for estimation of the time of infection. The infection itself is known to have a connection with diseases like diabetes mellitus and CNS diseases.

Aim. To assess the seroprevalence of T. gondii IgG and IgM antibodies in general population in Latvia during 4-year period and to identify the contribution of diagnoses potentially associated with T. gondii seropositivity.

Materials and methods. The data for present study was collected from 9,795 patients routinely tested for the presence of anti-T. gondii IgG or IgM antibodies in the diagnostic laboratory. Additional information on patients age, gender and contributive diagnosis were collected and statistically analyzed by means of open source software OpenEpi v.2.3.1. This study has been approved by Institute of Food Safety, Animal Health and Environment “BIOR” Ethical commission.

Results. Overall, the anti-T. gondii IgG seroprevalence was observed 34.3 % (CI 33.3–35.3 %, n = 8.342) and IgM seroprevalence – 1.5 % (CI 1.3–1.8 %, n = 7.712). Seroprevalence of anti-T. gondii IgG antibodies was the highest in the age group 30–39 reaching 36.7 % (CI 35.0–38.4 %, n = 3,064). While, the seroprevalence of IgM antibodies was the highest in the age group 20–29 reaching 1.6 % (CI 1.2–21 %, n = 2,680). Higher IgG antibodies seroprevalence was observed in females (35.3 %, CI 34.2–36.5 %, n = 6,995) comparing to that observed in males (29.5 %, CI 27.1–32.1 %, n = 1,307). However, the higher seroprevalence of IgM antibodies was observed in males (1.8 %, CI 1.2–2.7 %, n = 1,311) comparing to that observed in females (1.5 %, CI 1.2–1.8 %, n = 6,359). The most popular contributive diagnose for testing anti-T. gondii was pregnancy (46.8 %, n = 3,503) followed by medical observation (32 %, n = 2,396), urogenital tract diseases (3.7 %, n = 280), endocrine diseases (3.4 %, n = 257) and respiratory diseases (3 %, n = 227).

Conclusion. The present study shows that T. gondii is prevalent in general population of Latvia and most susceptible patients are from age groups from 20 till 39 years. Five diagnoses, including pregnancy, medical observation, urogenital tract diseases, endocrine and respiratory diseases, were observed as contributive. The further investigations are in progress.
ROSACEA AND SYSTEMIC CHRONIC INFLAMMATION

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Keywords. Rosacea, chronic systemic inflammation, diagnostic tests.

Introduction. Rosacea is a chronic skin condition with frequent relapses and therapy resistance. During last several years the disease prevalence increased rapidly (2–22%) (Tan et al., 2016), which justifies the amount of new research on the topic. Latest scientific researches show correlation between rosacea (or others inflammatory dermatoses) and functional dysfunction of digestive system as well as metabolic syndrome and systemic inflammation correlations, but problem – specific studies are very sparse. That's why crucial is identification of objective markers for systemic involvement to improve measures for treatment of rosacea patients and prevention of systemic risks.

Aim. To perform a descriptive statistical analysis of rosacea patients and patients with other inflammatory dermatoses.

Materials and methods. Retrospective laboratory analyses of dermatological patients from years 2008–2017 are used. All patients were divided into 3 groups: I group – rosacea diagnosis, II – acne vulgaris and III – patients with other inflammatory dermatoses (including psoriasis, contact dermatitis and others). Specific new developed laboratory markers were analysed in each group – HOMA (the homeostasis model assessment), CRO, TNF-alpha, TG, transglutaminase IgG, hsCRP (high-sensitivity CRP). Microsoft Excel 14.7.2 was used for data registration and IBM SPSS Statistics Data Editor 22 for data analysis.

Results. Data of 81 patients are included in this study. Rosacea (group I) was in 34 patients (31 women and 3 men). 5/34 patients had HOMA index analysis performed with the mean value of 1.73; 9 patients had CRP analysis performed (mean – 0.67 mg/L). Both TNF-alpha and hsCRP were performed on 3/34 patients (mean – 5.17 pg/ml and 0.954 mg/L respectively). 23/34 patients had TG analysis performed (mean – 1.53 mmol/L). 12/34 patients had transglutaminase IgG analysis performed (mean – 1.52 IU/ml). In 37 patients (group II) acne vulgaris was diagnosed (33 women, 4 men). 29/37 patients had TG analysis performed (mean – 1.00 mmol/L); 5/37 patients had values above 1.7 mmol/L. 17/37 patients had transglutaminase IgG analysis performed (mean – 1.38 IU/ml). In 37 patients (group II) acne vulgaris was diagnosed (33 women, 4 men). 29/37 patients had TG analysis performed (mean – 1.00 mmol/L); 5/37 patients had values above 1.7 mmol/L. 17/37 patients had transglutaminase IgG analysis performed (mean – 1.38 IU/ml); 7/37 patients had CRP analysis performed (mean – 4.79 mg/L), 1/37 patient had value 29.6 mg/L. HOMA index values were 0.77 and 2.69, TNF-alpha value was 13.00 pg/ml. In I group 2/5 patients had increased HOMA index and 3/23 – increased TG value. In II group 5 patients had TG values > 1.7 mmol/L. Also 1 patient had increased HOMA index and 1 – TNF-alpha value.

Conclusion. There is essential need for guidelines about routine examination protocol to be conduct for patients with chronic inflammatory dermatoses to manage preventively and therapeutically systemic correlative inflammatory disturbances.
CHARACTERISTICS OF ATOPIC DERMATITIS IN CHILDREN UNDER THE AGE OF THREE YEARS

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Keywords. Atopic dermatitis, atopy, Immunoglobulin E, allergy skin tests, eczema.

Introduction. Atopic dermatitis (AD) is a chronic skin disease and it is thought to be the most common childhood eczema. Worldwide, the prevalence of atopic dermatitis is 2.2% to 36.8% in children. AD diagnosis is primarily based on clinical presentation. In literature about 45% of patients develop this disease before age of 6 months and in 60% under the age of 1 year. Most common symptoms include pruritus and eczematous skin lesions with chronic or relapsing history. 70 to 90% of cases in childhood resolve by adulthood.

Aim. To determine age in which atopic dermatitis diagnosis was made. Identity if patients have atopy and to find how many patients have higher IgE values and higher sensitivity to allergens.

Materials and methods. Retrospective descriptive study of patients who were born between years 2009–2017 and had an appointment with dermatologist or allergist between 2012–2017 using database Saule and outpatient cards. Microsoft Excel and SPSS 23.0 software descriptive statistics were used for statistical analysis.

Results. In randomised selection of 325 patients 76 aged between 3 months and 3 years were diagnosed with atopic dermatitis. In 22% (n = 17) diagnosis was made till 6 months of age and also in 22% (n = 17) diagnosis was made from 6 months till 1 year of age. In 41% (n = 31) diagnosis was made from 1 to 2 years of age. And in 15% (n= 11) diagnosis was made for 2-3 years of age. Data acquired from outpatient cards showed that 21% (n= 16) of patients also had bronchial asthma or allergic rhinitis or had positive family history of atopy.

To patients whose quantitative IgE was tested most had higher than normal values, with mean value 181.58 U/ml. Allergy skin prick tests were done to 32% (n = 24) of patients and in 29% (n = 7) higher sensitivity was found. Very few of the patients had higher than normal values of eosinophiles and C-reactive protein. Most frequent symptoms were dry, scaly skin often with hyperemia and pruritus.

Conclusion. In contradiction to literature largest percentage of patients were diagnosed with atopic dermatitis in ages between 1 and 2 years. Patients whose IgE was measured had higher than normal values. Only 21% of patients had bronchial asthma or allergic rhinitis or positive family history of atopy. Only one third of the patients had allergy tests done and in less than half higher sensitivity was found.
1-YEAR, 5-YEAR AND 10-YEAR SURVIVAL FOR PATIENTS WITH MELANOMA DIAGNOSED IN 2006–2007

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Keywords. Melanoma, survival, prognosis.

Introduction. Skin melanoma is the most aggressive form of skin cancer. In addition to the stage of melanoma at diagnosis, previous surveys have found that other prognostic factors such as age, sex, histology, and location are related to melanoma survival.

Aim. Purpose of our study was to assess the prognostic factors of melanoma.

Materials and methods. We investigated melanoma specific survival up to 10 years from diagnosis for 176 first primary cases of melanoma diagnosed at National Cancer Institute in 2006–2007. The analysis was performed for 1-year, 5-year and 10-year survival. Data were processed using Microsoft Excel, data analysis was conducted using SPSS® software. Value of P < 0.05 was considered significant.

Results. Overall, the one-year, five-year, and ten-year melanoma-specific survival was 94.12%, 55.29%, and 47.06%, respectively. The study involved 112 women (64%) and 64 men (36%). Females had better one-year (89%), five-year (72%) and ten-year (63%) survival than men (82%, 43%, and 38%, respectively). Melanoma-specific survival dependent on sex had a statistically significant difference (p = 0.023). Patients given the diagnosis at the age of 65 and older had lower one-year (74%), five-year (42%) and ten-year 10-year (39%) survival than younger people. Melanoma-specific survival in different age groups did not have a statistically significant difference (p = 0.273). Melanomas that had been diagnosed at IV stage or were thicker than 4.00 mm had lower survival. The stage (p = 0.002) and depth (p = 0.022) of melanoma had a statistically significant impact on melanoma survival. Melanoma diagnosed on the skin of the back/breast had the worst survival depending on the anatomic site (one-year – 94%, five-year – 49%, and ten-year – 39%). However, melanoma-specific survival dependent on the anatomic site did not have a statistically significant difference (p = 0.236). Nodular melanoma had the poorest 5-year and 10-year melanoma specific survival among histological subtypes (57% and 39%). Melanoma survival in different histological subtype groups had a statistically significant impact on melanoma survival (p = 0.019).

Conclusion. Sex had a statistically significant impact on 1, 5 and 10 years melanoma survival. Melanoma thicker than 4.00 mm is statistically significant 1, 5 and 10 years melanoma survival prognostic factor. Nodular melanoma had a statistically significant impact on 1, 5 and 10 years melanoma survival. The stage IV melanoma is statistically significant 1, 5 and 10 years melanoma survival factor. There were no statistically significant results for 1, 5 and 10 years melanoma survival depending on age and anatomic sites.
IMPACT OF EDUCATION ACTIVITIES ON SOCIAL BEHAVIOUR TOWARDS INDOOR TANNING FACILITIES

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Keywords. Skin cancer, vitamin D, ultraviolet radiation, indoor tanning facilities.

Introduction. According to the data held by the Center for Disease Prevention and Control, in 2015, 224 cases of melanoma and 85 deaths from it have been stated, as well, 2000 cases of nonmelanocytic skin cancer arise. To tackle this important global public health issue, costly skin cancer programs have initiated. These health campaigns strive at enhancing awareness regarding the potential danger of UV radiation. To supplement the clinical perception of skin disease diagnosis and treatment, we implemented the concept of public (skin) health term for conceptual and pragmatic research in the field of skin health promotion and cancer prevention.

Aim. Analyse the attitude of society towards indoor tanning facilities in the last years.

Materials and methods. Prospective investigation research was done. Both gender, 100 respondents were analysed, aged 18 and older. Skin phototype of participants was I-III according Fitzpatrick classification. The data was analysed using IBM SPSS 23. Data was expressed as count and percentage value. Obtained data was processed using Pearson’s Chi Square statistical test.

Results. Most part of respondents (n = 84) were female, (n = 16) male, 49 % were aged 18–25. Sun protection cream is used by 69 % of respondents. Indoor tanning facilities at least once in lifetime had visited 62 % and 56 % of respondents used them at least once in last 2 years. The frequency of visiting did not change in 55 % of respondents, but 40 % started using tanning beds less. In past 2 years 57 % of participants admitted decreased usage and intensity of indoor tanning facilities. Most common reason for tanning bed usage in 40 % is enhancing aesthetic effect and in 22 % intake of vitamin D. Large part (74 %) pointed out, that in the last years more information about the risks of using solarium is accessible. Changes in pigmented lesions after usage of tanning beds was admitted by 9 % of participants.

Conclusion. Educational events are important, as the frequency and intensity tanning bed usage has decreased in the past 2 years. The information about negative impacts of tanning beds is more accessible nowadays, the main source of information is social media. The data of the research indicates, that further education of society is required, particularly paying attention to the metabolism of vitamin D in human organism.
III PAEDIATRICS, GYNAECOLOGY, OBSTETRICS

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DATA COMPARISON BETWEEN PHARMACOLOGICAL INDUCTION OF LABOUR AND SPONTANEOUS DELIVERY

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Keywords. Induction, nulliparous women, spontaneous delivery.

Introduction. Induction of labour involves the artificial stimulation of uterine contractions with the aim of achieving vaginal delivery. The main point of this study is to understand, what type of complications have inducted labours.

Aim. To compare the differences in the maternal and fetal outcomes between pharmacological induced and spontaneous labour in nulliparous women.

Materials and methods. This was a prospective observational study of 72 women, which carried out over a period of 5 months. The study population comprised nulliparous pregnancies, who were inducted with perioral prostaglandin E2 (PGE2) at a gestational age of 40 weeks. Control group: patients who had a spontaneous labour at gestational age of 41 weeks.

Results. 32 patients with induction of labour and 40 with spontaneous labour were enrolled. Nulliparous women whose labour was induced spent a longer time in labour than women who presented in spontaneous labour. Cesarean delivery was performed in 40 cases: induction group – 14 cases (44 %), spontaneous group – 26 cases (35 %). Both the 1-minute and the 5-minute Apgar scores were higher in the induced group and newborn weight and height were higher in spontaneous group and no neonatal complication occurred in either groups. Epidural anesthesia was performed more frequent in spontaneous group (52 %). Episiotomy was performed more frequent in spontaneous group (73 %), and in induction group (27 %). However, the amount of perinal laceration was higher in induced group – (57 %), but in spontaneous group – (43 %). The percentual correlation of pereneal laceration (stage I) in induced and spontaneous group is equal. The amount of pereneal laceration (stage II) was higher in induced group (62.5 %). The number of uterine dysfunction in two groups is equal (50 %). However, the I stage of uterine dysfunction was seen more frequent in induced group (65 %), but stage II of uterine dysfunction – in spontaneous group (66 %).

Conclusion. Prospective trials on labour management in a larger sample of women could be useful.
PRELIMINARY MORPHOMETRIC ANALYSIS OF PLACENTA IN PREGNANCY INDUCED DIABETES AND HYPERTENSION

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Keywords. Pregnancy, Hypertension, Gestational diabetes, Placenta, Fetal Outcome.

Introduction. The placenta is a unique characteristic of the higher mammals which is attached to the uterus and is connected to the fetus through the umbilical cord. Metabolic diseases like Pregnancy Induced Hypertension (PIH), chronic hypertension (HTN) and Gestational Diabetes Mellitus (GDM), effects the tissue components of placenta causing placental insufficiency. These diseases are common in high risk pregnant women like advanced maternal age (> 35 years), obesity, family h/o HTN, h/o PIH, DM, macrosomia, IUGR and unexplained fetal loss in previous pregnancies.

Materials and methods. A total of 100 freshly delivered placentae were collected from my teaching hospital and a nearby government general hospital. The placentae were collected soon after expulsion from normal deliveries, forceps deliveries and caesarean sections.

Results. Placental morphometric study: Mean placental weight: The mean placental weight was more in GDM group (426.25 ± 48.02 grams) and the difference was highly significant (p < 0.01) and it was less in PIH group (376.25 ± 39) the difference is significant p < 0.05. Mean placental cotyledons: The mean number of cotyledons was higher in GDM group (18.38 ± 2.27). The difference was significant (p < 0.05). And it is less in PIH group (14.78 ± 2.28) with significant difference of p < 0.05. Mean placental central thickness: The mean central thickness was significantly more (p < 0.05) in GDM group (2.12± 0.35centimeters) and significantly less (p < 0.05) in PIH group (1.82 ± 0.22). Mean placental diameter: The mean placental diameter was (16.33 ± 1.14) centimeters in GDM group and the difference between both groups was highly significant (p < 0.01). While it is less (14.46 ± 1.81) in PIH group and the difference was significantly low (p < 0.01). Comparison of placental shape: While in GDM group 35% of placentae were round shaped and 65% were oval shaped. The difference was not significant (p > 0.05). In PIH group 20% of the placentae were round and 80% of placentae were oval. The difference was not significant (p < 0.01). Comparison of umbilical cord insertion: In GDM group it was central in 25%, eccentric in 60% and marginal in 15% of placentae. The difference between two groups was again not significant (p > 0.05). In PIH group umbilical cord insertion was central in 17.5%, eccentric in 30% and marginal in 52.5%. The difference between the two was not significant. Fetal outcome: In PIH group, the weight of the baby was found to be less. On the other hand, the mean weight of the baby in GDM group was quite more than that of the control 3241 ± 206.

Conclusion. In mothers who have had no previous prenatal checkup, a thorough examination of placenta helps in the early diagnosis of the fetal complications, soon after parturition and thus helps in the treatment of the baby by the neonatologists. From this study we conclude that placentae of women with gestational diabetes mellitus and Hypertension show significant variation in gross morphology that can be associated with impaired function of placenta, leading to adverse perinatal outcome. The present study indicates that placenta also plays a key role in improving the neonatal care.
QUANTITATIVE ULTRASOUND ANALYSIS OF FETAL LUNG MATURITY TO PREDICT NEONATAL RESPIRATORY MORBIDITY

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Keywords. Fetal lung maturity, quantitative ultrasound analysis, non-invasive method, neonatal respiratory distress syndrome.

Introduction. Neonatal respiratory distress syndrome is a serious issue associated with fetal lung prematurity in preterm delivery. The less gestational age is, the higher risk of premature lung tissue of fetus is expected. Until recently, the principle method describing the condition of fetal lung maturity conjointly with gestational age was invasive amniocentesis technique.

Latest studies report that non-invasive approaches, such as quantitative ultrasound analysis, are able to prognose neonatal respiratory distress syndrome with accuracy, similar to that of invasive methods.

Aim. To evaluate the feasibility of non-invasive quantitative ultrasound analysis for predicting neonatal respiratory morbidity.

Materials and methods. This study prospectively evaluated 72 images, acquired from patients who gave birth in 2017 from May to November in Vilnius University Hospital Santaros Clinics. Images were obtained from Voluson E8 ultrasound equipment. Patients were divided into 3 groups by gestational age (GA) at time of delivery from 23+0–27+6 and 28+0–33+6 to 34+0–40+6. Moreover, the risk predicted by quantusFLM was stratified into 7 groups in ascending order and its correlation with birth outcomes designated as neonatal respiratory distress syndrome was analyzed. Statistical data analysis was performed using IBM SPSS 22.0.

Results. Among the 72 neonates, there were 32 cases of neonatal respiratory distress syndrome. The strong correlation between quantusFLM predicted risks and birth outcomes was observed (correlation strength coefficient 0.756, p value < 0.005). Quantitative texture analysis predicted neonatal respiratory morbidity from fetal lung maturity image with sensitivity, specificity, positive predictive value and negative predictive value of 75.0%, 92.5%, 88.9%, 82.2% respectively.

Conclusion. Quantitative ultrasound analysis of fetal lung maturity predicted the risks of neonatal respiratory distress syndrome with accuracy similar to previously reported studies about both invasive and non-invasive techniques with benefit of being a conservative diagnostic method.
MECONIUM STAINED AMNIOTIC FLUID IN POST-TERM PREGNANCIES COMPARED TO TERM PREGNANCIES

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Keywords. Meconium stained amniotic fluid (MSAF).

Introduction. Studies show that about 13% of all live births have antenatal release of meconium and that the risk for meconium stained amniotic fluid (MSAF) increases with gestational age due to maturation of the foetal gastrointestinal system and/or foetomaternal stress. In this research paper, patient files were analysed to see if there is a higher incidence of MSAF in post-term pregnancies compared to term-pregnancies in Latvia and to discover other contributing risk factors.

Aim. The aim of the research paper is to find out if the risk of being born through MSAF is higher in post-term pregnancies compared to term-pregnancies and to discover other contributing factors.

Materials and methods. A retrospective cohort study based on 202 patient files with the ICD-10 Labour and delivery complicated by meconium in amniotic fluid code (O68.1), chosen randomly from the archives of Riga Maternity Hospital from December 2016 and January 2017.

Results. Meconium stained amniotic fluid was verified in 27.7% of all the 202 deliveries (Pearson Chi-Square, p = 0.530). 29.7% in the post-term patient group, and 25.7% in the term patient group. Meconium was associated with: induction of labour (p = 0.003), obstructed labour (p < 0.000), mode of delivery (p = 0.008), maternal use of antibiotics (p = 0.012), and group b streptococcal status of the mother (p = 0.038). The data was analysed using SPSS and Pearson Chi-Square test.

Conclusion. In this study, the difference in the incidence of MSAF between post-term deliveries compared to term deliveries is not statistical significant. However, other variables showing statistically significant results, can be directly associated with higher gestational age rather than being significant itself.
THE USE OF QUESTIONNAIRE SCL-90-R IN WOMEN WITH COMPLICATED GESTATION

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Keywords. Complicated pregnancy, psychological symptoms, questionnaire SCL-90-R.

Introduction. Various psychological symptoms or disorders may emerge as a consequence of pathological pregnancy. Abnormal pregnancy may also aggravate the existing but possibly undiagnosed psychological condition. However, maternal mental health continues to be a neglected subject of obstetric medicine. Thus it shows a need of screening for psychological symptoms and disorders during the course of pathological pregnancy in order to improve mother and child outcomes.

Aim. The aim of this study was to estimate the prevalence of the psychological symptoms among the women with complicated pregnancies, who underwent treatment in the Department of Pathological Pregnancy (DPP) and in the Obstetrics Day-care unit, in the Centre of Obstetrics and Gynecology at Vilnius University Hospital Santaros Clinics.

Materials and methods. Ninety pregnant women, who were hospitalized in the DPP or attended OD were asked to answer some demographic and pregnancy related questions as well as fill in the Revised Symptom Checklist-90 (SCL-90-R) questionnaire. In this questionnaire women were asked about how much they were bothered by the exact symptoms during the last week. The symptoms were divided into nine different psychological disorder subscales: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism.

Results. A total of 83 patients were included in the study: 59 women were hospitalized in the DPP and 24 attended OD. The research has shown that intensity of psychological symptoms did not depend on any demographic parameters, neither on pathological pregnancy related factors or its treatment. Respondents who were treated in the DPP had the symptoms of interpersonal sensitivity and phobic anxiety expressed more intensively than those in OD (p < 0.05). Somatization symptoms were significantly more intensive in the group of patients who have had cesarean section in the past (p < 0.05). Pregnant women with the diagnosis of false labor before 37 completed weeks of gestation appeared to have significantly less intensive symptoms of all psychological symptom subscales in contrast to those women who have had other diagnoses (p < 0.05).

Conclusions. This study revealed that the psychological symptoms were more intense in pregnant women who were treated in the OD and were dependent upon the history of cesarean section operation and the pathological diagnoses of pregnancy.
DOES FETAL WEIGHT ESTIMATION IN DIABETIC PREGNANCIES IS ACCURATE ENOUGH?

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Keywords. Diabetes, pregnancy, gestational diabetes, fetal weight, fetal weight estimation, newborn, ultrasound.

Introduction. Diabetes during pregnancy causes complications, negatively impacts the state of a newborn. One of the most harmful of complications include diabetic fetopathy, which is characterized by fetal macrosomia, bigger volumes of limbs and excess fat tissue. Having diagnosed the mentioned complication on time, it is possible to choose the right method of giving birth, evaluate the necessity for Cesarean section and avoid labor complications.

Aim. To evaluate if the biometrical measurement of the mature fetus as provided by the ultrasound examination during the period of 37–41 gestational weeks allow to foresee the weight of the newborn.

Materials and methods. Analysis of literature regarding the fetal weight estimation by using the biometrical measurement during full term pregnancy was conducted. 278 cases were selected from the database of the Vilnius University Hospital Santaros Clinics. The women chosen for the case-control study were classified into groups in the following order: the first group containing 144 patients who were diagnosed with pre-gestational and gestational diabetes, and the second group covering 52 patients whose newborns weighed more than 4000 grams excluding the patients with chronic and acute pathologies during the pregnancies. The measurements of biparietal diameter, head circumference, abdominal circumference and femur length were collected from the ultrasound examinations conducted for fetuses during 37–41 gestational weeks. The estimated fetal weight (EFW) was calculated using different formulas. For both groups EFW result was compared with the weight of a newborn. The calculations were obtained using Microsoft Excel and IBM SPPS software.

Results. The conducted statistical analysis revealed that in the case group none of the estimated fetal weight calculated using formulas including Hadlock 1–5, Shepard, Combs, Higginbottom, Ott and Thurnau were accurate enough to estimate newborn weight (p > 0.05). In the control group statistically significant difference was found in fetal weight estimation with formulas of Hadlock 1–4, Combs, Higginbottom and Ott.

Conclusion. The classical formulas of fetal weight estimation are not accurate enough to predict the weight of the newborn whose mother suffers from pre-gestational or gestational diabetes. Despite the fact that Shepard formula is one of the classical fetal weight estimation formulas, EFW calculated by Shepard formula does not correlate with weight of a newborn in both case and control groups.
IS IVF TWIN PREGNANCY IS AS SAFE AS SPONTANEOUS TWIN PREGNANCY?

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Keywords. IVF, twin pregnancy, gestational diabetes.

Introduction. In vitro fertilization (IVF) use for infertility treatment is associated with higher risk for twinning. It is still an open issue whether IVF pregnancy, including twin pregnancy, is as safe as spontaneous, because some studies have found that IVF twins have an increased risk for obstetric and perinatal complications, e.g. low birth weight, preterm birth and preeclampsia, but the results of different studies are conflicting.

Aim. To analyze the obstetric and perinatal complications rate between IVF and spontaneous twin pregnancies.

Materials and methods. To compare IVF and spontaneous twin (ST) pregnancies we have performed retrospective case-control study. The information about 71 IVF twin and 144 ST pregnancies obstetric and perinatal outcomes and complications was gained from the medical records at Riga Maternity Hospital. Three patients with monochorionic-monoamniotic pregnancy were excluded from further statistical analysis, because occurred only in ST group. Statistical analysis was performed using SPSS V22.0 software. To exclude possible effects of confounders, data was adjusted for maternal age, parity, BMI and smoking status.

Results. Mean maternal age is higher for 2 years in IVF group comparing with ST group (33.2 ± 0.5 vs. 31.3 ± 0.4 years, p = 0.004). BMI, smoking status, alcohol usage, frequency of systemic diseases and paternal age do not differ between two groups.

After statistical analysis, we have found that preterm labor risk, fetus weight and weight difference between twins, intrauterine growth restriction risk is not associated with IVF or spontaneous conception (p > 0.05).

Analyzing maternal-associated complication, frequencies of gestational hypertension and preeclampsia after correction for confounding factors do not differ between analyzed groups (p > 0.05). Although IVF twin pregnancy statistically significantly is associated with increased risk of gestational diabetes comparing with ST (12.7 % vs. 3.5 %, p = 0.018, OR = 3.95, 95% CI (1.27–12.27)). After adjustment for BMI and other possible confounding factors the association remained significant (OR = 4.45, 95 %CI (1.34–14.84)).

Caesarian section statistically significantly was used more often in IVF twins comparing with ST (71.8 % vs. 54.6 %, p = 0.018, OR = 2.12, 95% CI (1.15–3.91)).

Conclusion.
1. Obstetric and perinatal complication risk was not different between IVF and spontaneous twin pregnancies in our study.
2. Pregnancy with IVF conceived twins is associated with increased risk of gestational diabetes development comparing with spontaneous twin pregnancy.
3. IVF twins have higher odds to be delivered by the Caesarian section comparing with spontaneous twins.
IN VITRO FERTILIZATION: IT’S SUCCESS RATE’S DEPENDENCY ON AGE AND BODY MASS INDEX BEFORE PROCEDURE

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Keywords. In vitro fertilization, body mass index.

Introduction. The problem is of outstanding importance since the rate of couples whom cannot conceive is increasing. The prevalence of global infertility rates are difficult to determine due to the presence of both male and female factors which complicate any estimation. However, according to the World Health Organisation, one in four couples in developing countries has been affected by infertility. The best treatment for those women with blocked fallopian tubes, or the increasing numbers with unexplained infertility, is In vitro Fertilisation (IVF). For men with low sperm counts it is Intracytoplasmic Sperm Infection (ICSI), which is a specialised form of IVF where an individual sperm is injected directly into the egg.

Aim. The aim of this study was to analyse whether age and Body Mass Index (BMI) have an effect on pregnancy rate after performing In vitro Fertilisation (IVF) and Intracytoplasmic Sperm Infection (ICSI) procedures.

Materials and Methods. A retrospective study of 1166 stimulated cycles had been carried out at the Vaisingumo klinika. The women were examined according to their age and BMI before the procedure.

Result. 40.05 % of women became pregnant after IVF/ICSI procedures. It was determined that the age and BMI significantly correlate with pregnancy rate statistically after IVF and ICSI procedures (p = 0.001 and p = 0.0001). The group divided according to their BMI consisted mostly of women having adequate weight. The study consisted mostly of women who were younger than 35 years and only a small part of women were older than 40 years old. The best results after IVF/ICSI procedures were seen in women with normal weight (45.13 %) and up to 35 years of age (44.71 %). The lowest birth rate was found in the obese women’s group (8.42 %) and over 40 years of age (17.02 %).

Conclusions. Age and BMI have a statistically significant correlation with pregnancy rate after IVF and ICSI procedures.
IS IT NECESSARY TO ASSESS FMR1 GENE (CGG) N VARIATION IN FEMALE PATIENTS WITH IDIOPATHIC INFERTILITY?

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Keywords. Women infertility, FMR1, CGG variation.

Introduction. The FMR1 gene contains trinucleotide CGG repeat variation, which defines FMR1 expression levels and patients’ phenotype. Fragile X syndrome is characterized by mental retardation and develops in patients with the full mutation (> 200CGG). If the number of repeats is between 55 and 200, it is defined as premutation and may cause premature ovarian insufficiency (POI). Premutation carriers’ frequency in Europeans is 1/250–1/500 of the female population. Alleles containing 45254 CGG repeats are called “grey-zone”. The number of repeats of CGG is not stable and may increase over generations from grey-zone to premutation and from premutation to full mutation. Most of the researches were concentrating on expanded number of CGG repeat, however animal studies and some researches with human subjects reported that low number of repeats (< 26CGG) is also associated with early ovarian aging and infertility.

Aim. To investigate the influence of CGG variation in FMR1 gene on the development of idiopathic infertility in women.

Materials and methods. The study comprised 153 female patients with primary and secondary idiopathic infertility (including 3 patients with POI and 5 patients with poor response to ovarian stimulation) and 124 samples of healthy women with children as a control group. Samples were provided by the infertility treatment clinics and Genome Database of the Latvian Population. FMR1 alleles were identified by the triplet repeat-PCR followed by capillary electrophoresis. Statistical analysis was performed using SPSS V22.0 software.

Results. Analyzing CGG repeats it has been found that one patient with secondary infertility (0.7 %) is a carrier of FMR1 premutation (61 CGG repeats) and was referred to a clinical geneticist. Three of the infertile patients (1.96 %) are carriers of a grey-zone allele.

Analyzing FMR1 gene allele’s distribution in healthy women with children, surprisingly we have found that one control (0.8 %) is a carrier of the premutation allele (63 CGG repeats) and one control is a carrier of a grey-zone allele. The premutation carriers’ number in healthy general population of Latvia is higher than in other European populations, according to the literature (1/124 vs. 1/250–1/500). There is no significant difference in premutation and grey-zone allele frequency between patient and control groups (p > 0.05).

The allele with low number of CGG repeats is found in 19.9 % of patients with infertility and in 22.2 % of control group’s subjects (p = 0.42, OR = 0.87, 95 % CI (0.58–1.32)).

Conclusion.
1. FMR1 premutation allele carriers’ frequency in Latvia may be higher than in other European populations.
2. Grey-zone allele and low CGG repeat allele was not associated with idiopathic infertility in women in our study.
3. Further research is necessary to solve the controversies about FMR1 gene’s role in the development of infertility.
ANALYSIS OF HABITS TO VISIT GYNAECOLOGISTS IN THE POPULATION OF ORGANIZED CERVICAL CANCER SCREENING PROGRAMME NON-ATTENDERS IN RIGA AND TWO OTHER REGIONS OF LATVIA

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Keywords. Cervical cancer screening, cervical cancer.

Introduction. Latvia has one of the highest incidence and mortality rates for cervical cancer in Europe. In contrast, compliance to the organized cervical cancer screening programme invitations’ letters is low – around 25 % yearly. Many women, used to have frequent prophylactic gynaecological visits outside the programme, others do not have any examinations for years.

Aim. The aim of this study was to analyse and to compare factors associated with low attendance rate of cervical cancer screening programme between women who attended a gynaecologist for at least once every 3 years and women who had not visited a gynaecologist for more than 3 years.

Materials and methods. A cross-sectional study was performed in the three general practitioners’ clinics from 01.01.2017. to 30.06.2017. National Health Service database was used to identify women aged 25–70 who had not participated in the organized cervical cancer screening programme for the last three years. The results were compared between two groups.

There was made a special questionnaire that included socio-demographic factors, reasons for non-attendance and factors that might increase participation in the organized screening programme. The study was approved by the Ethics Committee of Rīga Stradiņš University.

Results. According to our data a total of 523 women were surveyed, 113 of them had not visited a gynaecologist for more than 3 years. The main reasons for non-attendance for women who have visited a gynaecologist regularly were − had not received an invitation letter (45.6 %, p = 0.001), had recent visited gynaecologist outside the screening programme (27.8 %, p < 0.001) and had lack of time (18.7 %, p = 0.016). For the second group the main reasons were consideration for cytological analysis to be unnecessary to them (19.5 %, p < 0.001), had fear to be smear taken (15.0 %, p < 0.001) and gynaecological clinic was too far (15.0 %, p < 0.001). The most frequent factors which could motivate women who rarely visit a gynaecologist to participate in the screening programme were − to receive reminders from GPs (31.9 %), possibility to give the smear with GPs (30.1 %) and improvement of availability of gynaecologists near the living place (30.1 %).

Conclusion. It is very important to involve more primary care professionals in the organized cervical cancer screening programme. All women should be regularly informed about the cervical cancer screening programme. It is crucial to improve organization of the screening programme, including recall system.
CHARACTERISTICS OF FEMALE SEXUALITY AND FIRST SEXUAL EXPERIENCES AMONG THE PATIENTS VISITING GYNAECOLOGY PRACTICE

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Keywords. Sexual life, first intercourse.

Introduction. To provide a patient with a personalized approach according to the patient’s needs, obstetricians and gynaecologists have to be aware of female sexuality, attitudes as well as they need to facilitate doctor-patient discussions of sexual health issues.

Aim. The aim of the research is to find out the woman's first sexual experience and to investigate the circumstances of first sexual intercourse.

Methods and materials. The study was designed as a cross-sectional study using a computer-based questionnaire. Subjects: 336 women aged 19–70. Data were collected from November 2017 until January 2018. Data was analysed using Microsoft Excel and SPSS 21.

Results. Research included 336 women at the mean age of 27 (SD 8.8; range 19–70).

96.4% (n = 324) participants reported that they have had sexual intercourse, 3.6% (n = 12) reported not had sexual intercourse. 65.6% (n = 212) reported that at the time of first intercourse their partner was older. The mean count of sexual partners was 5 (SD 2.2; range 1–59). 81.4% (n = 264) reported using contraceptives: 86.7% (n = 229) used condom, 11% (n = 29) coitus interruptus, 2.3% (n = 6) contraceptive pills, 18.6% (n = 60) reported not using any of the contraceptive methods. Sexuality: 81.7% (n = 264) participants reported having foreplay. 88.9% (n = 211) reported not feeling orgasm during first intercourse, 52.0% (n = 169) reported bleeding during first intercourse. 57.6% (n = 186) participants reported not regretting the first intercourse, 17.6% (n = 57) reported not being sexually satisfied after the first intercourse, 34.7% (n = 112) reported being rather unsatisfied than satisfied, 24.1% (n = 78) reported considering themselves sexually experienced, 17% (n = 55) considered themselves rather inexperienced than experienced, Opinions: 94.3% (n = 317) participants reported that they think it is acceptable for unmarried couples to have sexual intercourse. 31.5% (n = 106) reported that they should have waited longer for the first intercourse. 26.5% (n = 89) reported that they were not informed about birth control and preventing pregnancy in school. 33.3% (n = 112) reported that they have not received information on sexually transmitted diseases (STD) and STD’s prevention in school. 38.4% (n = 129) of participants reported that they were not able to talk to their parents about sexual life and intercourse, 33.9% (n = 114) reported they had this possibility partially.

Conclusion. The mean age at first sexual intercourse was 17. The mean count of sexual partners was 5. A lot of women reported that they were not received sex education in school as well as from parents and it is important for doctors for further women education.
GYNAECOLOGICAL PATHOLOGIES IN PAEDIATRICS AND ADOLESCENTS

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Keywords. Gynaecological pathology, children.

Introduction. Gynaecological pathology is common condition in paediatrics and adolescents. Gynaecological symptoms and complaints, which are relatively common in children, together with clinical examination, laboratory findings and imaging still often can provide diagnostic challenges. Laparoscopic or conventional surgery is used both as diagnostic and treatment method. Morphological examination of biopsy and surgical material is an integral part of final diagnosis confirmation. There is no statistical summary data of gynaecological pathologies in children in Latvia before.

Aim. The aim of this study is to analyse the most common gynaecological pathologies in children (age ≤ 18) in Latvia.

Materials and methods. Restrospective study included Childrens’ Clinical University Hospital data from 2014 to 2017. Totally 135 morphological gynaecological protocols and histories of 128 female patient were viewed. Age, most common morphological diagnosis, hospitalization lenght, description of surgery, cases of neoplasms and genetic disorders were analyzed. MS Excel and IBM SPSS software were used for data processing.

Results. In four years 128 females (age ≤ 18) with gynaecological pathology were identified. The average age was 14.03 years, the youngest – 6 days old, age mode – 17 years. There were 26 cases in 2014, 23 – in 2015, 46 – in 2016, 40 – in 2017. The most common morphological conclusions were functional ovarian cysts 29.3 % (n = 43), germ cell tumours, most frequent, dermoid cysts 21.1 % (n = 31), parovarian cysts 9.5 % (n = 14) and neoplastic ovarian cysts 6.8 % (n = 10). Totally 51 (37.8 %) cases were classified as neoplasms, from that 17.6 % (n = 9) malignancies. Invasive germinomas, immature teratomas and yolk sac tumours were the most common malignancies. The most frequent genetic disorders were Swyer syndrome (n = 3) and congenital adrenal hyperplasia (n = 2). One case was with androgen insensitivity syndrome. Biopsies were done in 9 cases, from that 5 done in the same time with surgical material removal. The average hospitalization lenght were 5 days. Acute pathologies were diagnosed in 58 cases (43.0 %). Different surgical techniques were used. From all 109 laparoscopies 10 cases (9.17 %) were ended laparotomically. Reoperation was needed in 7 cases.

Conclusion. Functional ovarian and ovarian dermoid cysts were the most frequent gynaecological pathologies in children in Latvia. Malignant gynaecological tumours are also found in paediatrics and adolescents. Gynaecological pathology identification in time might reduce need for surgical intervention. Multidisciplinary team is often needed to treat paediatric and adolescent gynaecological pathologies.
INFLUENCE OF SELECTED FACTORS ON THE PROGNOSIS IN NEWBORNS WITH GASTROCHISIS

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Keywords. Gastrochisis, ventilatory support (VS), full enteral feeding (FEF), total hospitalization period (THP).

Introduction. Gastrochisis is a defect of the abdominal wall, resulting in congenital evisceration and requiring neonatal intensive care and early surgical correction. This study evaluated newborns with gastrochisis, seeking the influence of selected risk factors: time of ventilatory support, time needed to achieve full enteral feeding and total hospitalization period.

Aim. The purpose of the study was to evaluate the influence of selected factors for prognosis in newborns with gastrochisis.

Materials and methods. A retrospective analysis of all newborns with gastrochisis treated between 2011–2017 in the Children's Clinical University Hospital. Data collected from medical documentation included the following: presence or lack of prenatal diagnosis, mode of delivery, gestational age, mother's age, birth weight, interval between delivery and operation, kind of surgery (primary repair, Gore-Tex mesh), period of VS, time needed to achieve FEF, THP. Pearson Correlation was used to investigate the association between selected factors and end points (VS, FEF, THP). Statistical analysis was performed using IBM SPSS Statistics.

Results. During the study period 25 newborns with gastrochisis were treated. The full information was available for 23 newborns. Prenatal diagnosis was made in 14 patients (61%). Cesarean section was performed in 10 cases, vaginal delivery in 13 cases. The mean gestational age during delivery was 36.5 weeks, mean mother's age – 22.6 years, but mean weight of the newborn – 2642 g. Thirteen newborns were delivered before 37th week of gestation, ten after 37th week. Mean delivery-operation interval was 6.2 hours. During the first surgical intervention primary closure was possible in 14 cases, Gore-Tex mesh was used in 9 patients. Mean time of VS was 7.7 days, FEF was started in 39.3 days, THP – 60.6 days. Pearson Correlation showed that there was one independent factor that influenced all three end points. It was the mode of delivery. Patients who were delivered by cesarean section needed longer time to achieve full enteral feeding (r = 0.523, p = 0.026), they had a higher risk of long-standing ventilatory support (r = 0.585, p = 0.007) and a higher risk of longer hospitalization period (r = 0.617, p = 0.002).

Conclusion. In this study the mode of delivery was the main independent risk factor having influence on the prognosis of newborns with gastrochisis. Despite progress in prenatal diagnostics, obstetrics, neonatal intensive care and surgical methods, gastrochisis patients still remain a serious therapeutic problem requiring multidisciplinary care.
ATRIOVENTRICULAR SEPTAL DEFECT'S CORRECTION EARLY POSTOPERATIVE PERIOD COMPARISON IN PATIENTS WITH TRISOMY 21 AND WITHOUT TRISOMY 21

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Keywords. Atrioventricular septal defect (AVSD), postoperative period, 21st chromosome trisomy.

Introduction. 21st chromosome trisomy is the most common genetic disorder in children. An AVSD is the most frequent congenital heart defect found in children with Down's syndrome (DS). The majority of cases of AVSD are suitable for surgical intervention; this generally takes place within the first six months of life. Performed via a median sternotomy on cardiopulmonary bypass (CPB).

Aim. The aim of the study was to determine if trisomy 21 affects the postoperative condition in comparison with patients who do not have 21st chromosome trisomy.

Materials and methods. A retrospective study was carried out using the data of 51 patients who had undergone AVSD corrective open heart surgery till three years of age between the years 2007 and 2016. The data were collected from electronic database Andromeda and medical histories. The analysis of gathered data was carried out using IBM SPSS 23.0.

Results. A total of 51 patients participated in the study. Age ranged from 1 to 36 months (mean 10.75). 34 (66.7%) of all patients had DS. 17.6% (n = 9) patients died. Out of all death cases 2 of them died during operation and 7 during early postoperative period. 56.86% (n = 9) of all patients experienced postoperative complications. 66.7% of the death cases were patients with DS. The most common reason of complications was infection 33.03% (n = 9), 7 of them with DS; atelectasis 17.24% (n = 5), 4 of them with DS, chylothorax 17.24% (n = 5), 5 with DS and Atrioventricular (AV) block 16.66% (n = 7), 4 of them with DS. The length of the operation in average was 345.32 minutes (min = 103, max = 650), DS = 355.76 min, Control group (CG) = 323.13 min. Mean drainage time was 7.08 days (min = 2 days, max = 46 days), DS = 8.42 days; CG = 4.62 days. Mean antibiotics usage time was 10.81 days (min = 5 days, max = 60 days), DS = 11.83 days; CG = 8.92 days.

Conclusion. There was no statistical significance between the groups. Down’s syndrome is not associated with a longer operation, postoperative drainage and antibiotics usage time. Down’s syndrome is not associated with higher risk of complications, including infections, atelectasis, chylothorax, AV block. The study opens up a discussion if doctors should consider Down’s syndrome as a negative factor of operative outcome.
CONGENITAL DIAPHRAGMATIC HERNIA – ANALYSIS OF POSSIBLE PROGNOSTIC FACTORS PREDICTING THE OUTCOME

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Keywords. Congenital diaphragmatic hernia. Prognostic factors. Outcome.

Introduction. Congenital diaphragmatic hernia (CDH) – a relatively rare developmental defect due to a failure of the pleuroperitoneal canal to close. The size of the defect between the abdominal and thoracic cavities may be variable and it may have a significant impact on the clinical manifestation and prognosis. In this study we set out additional factors to determine if they affect the outcome.

Aim. To investigate and analyze the influence of selected postnatal prognostic factors for predicting the outcome. The primary outcome measure was survival.

Materials and methods. Retrospective study with data collection and analyze from medical documentation of patients with CDH born between 2012 and 2017, admitted and treated in the Children's Clinical University hospital. The selected prognostic factors included antenatal diagnostics, additional congenital abnormalities, Apgar at 1' and 5', need of an early intubation (≤ 3 h after birth), initial blood gases in the first 24 h, time interval between delivery and surgical therapy, stomach and liver presence in the thorax, type and duration of invasive ventilatory support. The outcome parameters were compared between survivors (S) and non-survivors (NS). Data were summarized and analyzed with MS Excel and IBM SPSS Statistics.

Results. 19 patients (pts) were identified, of whom 14 S, 5 NS. Total mortality rate – 26 %. 17/19 had left sided, 2/19 – right sided CDH. 17/19 pregnancies were monitored, prenatal diagnosis was made in 8 pts – 3 of them NS. The mean Apgar score at 1’ in S group was 5.5, NS 5.0. At 5’ – 6.7 and 5.6. Need of an early intubation was 64 % for S, 100 % NS. Initial blood gases in S (n = 11) and NS (n = 5) showed a median pH value of 7.18 and 7.02. The median PaCO2 – 62.92 and 77.42 mm Hg. 16/19 underwent the operation. 2 pts died before and 3 after the surgical therapy. The average time interval between delivery and surgery in S (excluding 2 cases who presented beyond the neonatal period) was 31.6 hours (r.: 11.1–59.3), NS 73.7 h (r.: 46.6–100.9). Intrathoracic liver observed in 3 pts (2 of them died), intrathoracic stomach – 2 (none of them died). 14/16 pts had a primary surgical repair (PR), 2/16 – Silo closure before PR. 2/14 S and 4/5 NS had additional congenital defects – 5/6 cardiac anomalies. The average required conventional ventilation time in S (n = 9) 175.9 h, NS (n = 3) – 25.7 h. High-frequency oscillatory ventilation for S (n = 6) was applied for 255 h, NS (n = 5) 157.3 h. There was a significant relationship between the outcome and additional abnormalities (r(17) = −0.623, p = 0.04) and a timing of repair (r(11) = 0.768, p = 0.002).

Conclusion. The possible predictors of outcome were additional abnormalities and interval between delivery and a surgical treatment.
ASSOCIATED CONGENITAL MALFORMATIONS IN LITHUANIAN COHORT OF DOWN SYNDROME CASES IN 2015–2017

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Keywords. Down syndrome, trisomy 21, congenital heart disease, digestive system anomalies.

Introduction. Down Syndrome (DS), also known as trisomy 21, is the most common chromosomal abnormality, affecting approximately 1 in 800 live births worldwide. DS is characterized by distinct dysmorphic features (flat face, epicanthus, downslanted palpebral fissures, hypoplastic earlobe, Simian creases, hypertelorism, sandal gap and low-set ears) and mild to moderate intellectual disability. Many other congenital malformations are also often observed in patients with DS.

Aim. This study aims to examine the major congenital anomalies occurring in infants with DS and to evaluate the most common distinct dysmorphic features.

Materials and methods. The database of chromosomal abnormalities was retrospectively reviewed and analyzed to identify patients diagnosed with DS from 2015 to 2017 at the Department of Human and Medical Genetics, Vilnius University.

Results. The cohort consisted of 65 patients (58.5% males, 41.5% females). Trisomy created through meiotic nondisjunction event was the most common cause (93.8%), with the unbalanced translocations and mosaic variants accounting for the remaining cases. The most common associated anomalies were congenital heart defects, 42 cases (64.6%), followed by digestive system anomalies (12.3%) and endocrine system anomalies (9.2%). The most common cardiac anomaly was patent ductus arteriosus (38.5%), followed by atrial septal defect (35.4%), atrioventricular septal defect (15.4%) and ventricular septal defect (7.7%). The other common findings associated with cases with DS were muscle hypotonia, congenital infections and typical dysmorphic features.

Conclusion. Studies, examining DS population, report various results. Therefore, there is no consensus which anomalies are predominant in DS. In our study, we observed a particularly high prevalence of congenital heart defects and high occurrence of digestive system anomalies. Thus, early diagnosis and appropriate interventions are essential to minimize disabilities which are present and to improve life quality of people with DS.
RESISTANT PATHOGENS AS CAUSATIVE AGENTS IN EARLY ONSET NEONATAL SEPSIS

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Keywords. Early-onset neonatal sepsis, antibiotics, drug resistant pathogens.

Introduction. Early-onset neonatal sepsis (EOS) remains a serious problem of neonates, especially preterm infants. EOS is defined as blood or cerebrospinal fluid culture proven bacterial infection in first 72 hours in preterm and first 7 days in term neonates. In suspected EOS empiric antibacterial treatment is used, however in case of drug resistant pathogens the clinical course of EOS is more aggressive.

Aim. To evaluate possible risk factors in evolving EOS due to empiric antibacterial therapy resistant microorganisms.

Materials and methods. Data regarding EOS from years 2007–2017 were collected retrospectively from Neonatal Intensive Care Unit of Riga Maternity hospital, Latvia. Cases where EOS was verified in < 72 h in preterm and < 7 days in term neonates were divided into two groups: Group 1 with 36 cases where EOS was caused by drug-resistant pathogen and Group 2 with 62 cases and no resistance. Data were further analyzed with SPSS 21.0.

Results. In Group 1 88.9 \% (n = 32) of neonates were delivered vaginally. Antibacterial prophylaxis during delivery received 33.3 \% (n = 12) in Group 1 and 22.6 \% (n = 14) in Group 2. Premature rupture of membranes more often occurred in Group 1 (36.1 \% vs. 21.0 \%; p = 0.102). Chorioamnionitis was diagnosed in 22.2 \% (n = 8) in Group 1 and in 14.5 \% (n = 9) in Group 2 (p = 0.350). Preterm birth was observed in 52.8 \% in Group 1 and 40.3 \% in Group 2, respectively (p = 0.232). Median gestational age was 35.5 (IQR 13) weeks in Group 1 and 38.0 (IQR 6) and didn’t differ significantly (p = 0.193), but birth weight was statistically different in both groups (0 = 0.012); in Group 1 the median birth weight was 2700 g, but in Group 2 – 3340 g.

Most frequently pathogens were resistant to 3\textsuperscript{rd} generation penicillins (72.2 \%), 2\textsuperscript{nd} generation cefalosporins (61.1 \%). There were more meningitis cases in Group 1 than in Group 2 (27.8 \% vs. 19.4 \%). Apgar score under 7 points after 1 minute much often was observed in Group 1 (22.2 \% vs. 9.7 \%) – p = 0.19, after 5 min there was statistically no difference in Apgar Score (p = 0.390)

Conclusion. Difference between resistant microorganisms in EOS of vaginally born neonates compared to C-section was not noticed. There was a tendency of higher prevalence of drug resistant pathogens in case of chorioamnionitis and premature rupture of membranes. Resistance to antibiotics occurred more often in preterm neonates and neonates born with lower birth weight. There is a significant role in primary assessment of neonate and Apgar score value.
IMPACT OF NEONATAL EARLY-ONSET SEPSIS CALCULATOR ON ANTIBIOTIC USE IN NEWBORNS WITH SUSPECTED INFECTION

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Keywords. Early onset sepsis calculator, newborns, antibiotic treatment.

Introduction. A neonatal early-onset sepsis (EOS) calculator is a tool that allows to calculate the risk for development of EOS based on maternal risk factors and infant’s clinical presentation. It has a potential to reduce newborn antibiotic over-treatment.

Aim. The aim was to compare actual antibiotic exposure to the estimated risk and recommendations based on the sepsis calculator in newborns with suspected infection and to investigate differences in EOS risk between early treatment newborns (< 12 hours) versus late treatment (≥ 12 hours of life).

Materials and methods. In a retrospective study data was obtained from medical records in Riga Maternity Hospital. Infants born ≥ 34 weeks of gestation who were started on antibiotic treatment for suspected EOS within 72 hours after birth were included. The EOS risk score per 1000 live births was calculated and each newborn was retrospectively assigned to the recommended category by the Kaiser Permanente neonatal EOS calculator. Statistical analysis was performed using MS Excel, IMB SPSS Statistics 22 software and p < 0.05 was considered statistically significant. Data were tested for normality using Shapiro-Wilk test. Cross tabulation with χ² test and Fischer’s exact test were used for nominal data, Mann-Whitney test and Kruskal-Wallis test for non-parametric data.

Results. A total of 205 newborns were included in the study. The EOS calculator recommended not to start antibiotic therapy in 156 (77 %) out of 205 infants. Antibiotic treatment was started early in 60 (29 %) and late in 145 (71 %) newborns. 13 (6 %) positive blood cultures were identified. Newborns that received early antibiotics had significantly higher maternal EOS score (median 1.39, IQR: 0.39–2.12) compared with newborns in the late treatment group (median 0.03, IQR: 0.02–0.04). Prematurity, cesarean section, spinal anesthesia, intrapartum antibiotic treatment, unknown group B Streptococcus status were associated with early antibiotic treatment. Full-term pregnancy, no intrapartum anesthesia, no intrapartum antibiotics – with late antibiotic treatment. Clinical condition deteriorated in the late treatment group, including one newborn with initially low risk score, but afterwards proven purulent meningitis.

Conclusion. Antibiotic use in newborns could be significantly reduced by more than 77 %, leading to less need for laboratory monitoring and more accurate antibiotic targeting. Newborns with initial low sepsis risk score clinically deteriorated beyond 12 h of life. Continuous good clinical observation is crucial. More safety data is needed.
ANTIMICROBIAL RESISTANCE IN CHILDREN’S CLINICAL UNIVERSITY HOSPITAL’S NEONATOLOGY CLINIC

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Keywords. Antimicrobial resistance, antimicrobial agents.

Introduction. Due to WHO Antimicrobial resistance threatens the effective prevention and treatment of an ever-increasing range of infections. New resistance mechanisms, usually through genetic changes, are emerging and spreading globally, threatening ability to treat common infectious diseases, resulting in prolonged illness, disability, and death.

Immunity of newborn is not matured enough, therefore, they are more difficult to cure in case of infectious diseases. Without effective antimicrobial agents for prevention and treatment of infections, medical procedures such as surgery and treatment of infectious diseases become very high risk. Also, antimicrobial resistance increases the cost of health care with lengthier stays in hospitals and more intensive care required.

Aim. Identify antimicrobial resistance to antimicrobial agents in the Children’s Clinical University Hospital’s Neonatology clinic in one year period (01.12.16.–30.11.17.).

Materials and methods. Data analysis from CCUH data system Andromeda using descriptive statistic methods.

Results. From analyzed 747 patients 276 (36.9%) had at least one resistant microorganism. The most common microorganism was group of coagulase-negative staphylococci, which was distributed in 77.9% cases from blood, 76% cases from umbilicus, 10.9% cases from skin folds. The most common of them were Staphylococcus epidermidis and coagulase-negative staphylococci without microorganism further identification. The highest resistance was against penicillin (76.7%), erythromycin (71.7%) and it was methicillin-resistant in 78.3% cases. Enterobacteriaceae family’s microorganisms were distributed in 65.5% cases from skin folds, 14.5% cases from umbilicus, 14.3% cases from blood, with highest resistance against ampicillin (93%). The most common of them was Escherichia coli which was distributed in 38.2% cases from skin folds, 6.0% cases from umbilicus and 3.9% cases from blood.

Conclusion. The antimicrobial resistance occurred in 36.9% of patients in CCUH’s Neonatology clinic in one year period. The most common microorganisms with antimicrobial resistance were Staphylococcus epidermidis, coagulase-negative staphylococci without microorganism further identification and Escherichia coli.
NEONATAL PATIENT IN THE EMERGENCY DEPARTMENT – IS IT REALLY AN EMERGENCY?

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Keywords. Emergency department, neonate, firstborn.

Introduction. Children’s Clinical University Hospital announced that in 52% of the patients who were brought to the Emergency Department (ED) in year 2015 and about 70% in year 2016 did not need an urgent medical assistance and could have been treated in the out-patient clinic. Neonatal patients have always been in a high risk group when speaking about their health condition. Although some studies show that the reasons why neonates are brought to the ED are not always adequate and often are associated with the neonate being the firstborn child in the family. Until now there were no data on neonatal patients in the ED in Latvia.

Aim. To find out the most frequent causes of why neonates are brought to the ED and to see if it correlates with the neonate being the firstborn in the family.

Materials and methods. A retrospective study including data from medical check-up lists of neonatal patients (0–28 days of life) from Children’s Clinical University Hospital’s Emergency Department from year 2017.

Results. 233 medical histories of neonatal patients were analyzed and divided into two groups. 68% (n = 159) were in the 1st group, i.e. patients who were hospitalized after being admitted to ED, and 32% (n = 74) in the 2nd group - patients, who were discharged from ED in less than 24 hours. The average age of patients was 17 days in the 1st group and 14 days in the 2nd. Only in 50% (n = 79) of cases in the hospitalized patient group there was data about the number of children in the patient’s family. In 48% (n = 38) of these cases the patient was the firstborn child. In the 2nd group the data about the number of children in the family was shown in less than 10% (n = 7). The most common complaints in the 1st group were - elevated body temperature (33%; n = 52), cough (20%; n = 31), problems with feeding (18%; n = 29), jaundice (17%; n = 27) and problems with sleeping - lethargic (14%; n = 22). The most frequent clinical diagnoses were - feeding problems of newborn, unspecified neonatal jaundice, unspecified acute bronchiolitis, unspecified fever and acute nasopharyngitis. Only 16% (n = 11) of the hospitalized patients had a severe course of illness. The most common clinical diagnosis in the 2nd group were - stenosis and insufficiency of lacrimal passages, superficial injuries involving multiple body regions and feeding problems of newborn.

Conclusion.
1. About one third (n = 74) of the patients that were brought to the ED did not have a medical emergency and were discharged right after being examined by the pediatrician.
2. Most of the medical histories for the 2nd patient group were incomplete, so it is recommended to do a prospective study including not only medical histories, but also questionnaires for parents.
THE ROLE OF PARENTAL OBSERVATIONS AND BELIEFS IN RECOGNIZING SERIOUS BACTERIAL INFECTIONS IN CHILDREN WITH FEVER

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Keywords. Serious bacterial infections, fever, parental observations.

Introduction. Child’s fever is one of the main concerns of parents and one of the first reasons for seeking help at the paediatric emergency department. Parental observations on child’s behaviour during febrile illness can be helpful in differentiating self-limiting viral illnesses from serious bacterial infections (SBI), which are a major cause of child mortality.

Aim. The aim of the study is to assess the significance of parental observations on child’s behavioural changes in case of fever in early recognition of SBI, and to analyse parental beliefs on the causes, effects and proper management of fever.

Materials and methods. This prospective observational study included children with their parents who presented to the emergency department of Children’s Clinical University Hospital with fever. A survey was used to collect data on parental observations on child’s behaviour during the episode of illness and to clarify their beliefs on proper management of fever. Additional data were collected to clarify the diagnosis; SBI was defined as pneumonia, acute pyelonephritis, osteomyelitis, bacterial gastroenteritis, bacteraemia, and sepsis. Associations between parental observations and development of SBI was established by SPSS statistical analysis platform (Pearson’s chi-squared test).

Results. The study included 70 patients aged two months to 17 years, 33 (47%) of them were boys. 25 (36%) patients were diagnosed with SBI. The only behavioural sign listed in the survey that was significantly more related to developing SBI was loss of appetite (p = 0.02). Parents of patients who developed SBIs more commonly expressed increased concern during this episode compared to previous episodes of fever in the same child (p = 0.02). However, the opinion that this illness was more severe than any other previous illnesses was not significantly related to the child developing SBI. 43 (61%) of parents stated that increased temperature alone indicates a severe illness, 19 (27%) said that there must be additional symptoms, only one parent stated that increased temperature does not mean severe illness. 11% of parents give antipyretics to children if temperature is up to 37.5 °C, 50% – at 38 °C, 30% – at 38.5 °C, less than 9% of parents allow temperature to raise above 38.5 °C. 45% of parents stated that temperature more than 39 °C is dangerous to the child. 71% of parents noted that in cases of fever they felt more secure when their child was treated at hospital compared to treatment at home supervised by family doctors.

Conclusion. Increased parental concern during a febrile episode can be useful in early recognition of SBI, however it is difficult to identify SBI based on behavioural changes observed by the parents. A significant proportion of the parents in this study expressed the opinion that fever itself is harmful to the child and indicates a severe illness, which may affect their judgement on the severity of the child's condition.
RELATIONSHIPS BETWEEN VITAMIN D LEVELS AND PULMONARY FUNCTION IN CHILDREN WITH CYSTIC FIBROSIS

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Keywords. Vitamin D, lung function, cystic fibrosis.

Background. Cystic fibrosis (CF) is an inherited disorder that causes severe damage to the lungs, digestive system and other organs. Vitamin D deficiency and lung function decrease is common in CF. Therefore it is important to identify whether serum vitamin D3 levels have associations with pulmonary function.

Aim. The purpose of this study is to identify relationships between vitamin D3 levels and pulmonary function in children with CF.

Materials and methods. 22 patients 5–18 years old with CF from ‘Vilnius City Clinical Hospital’s Clinic of Children Diseases’ were enrolled in this retrospective study from January 2015 to November 2017. The pulmonary function was measured with spirometry test during ambulatory care visits and hospitalizations. Spirometry measurements included forced volume vital capacity (FVC) and forced expiratory volume in one second (FEV1). Serum vitamin D3 levels were tested. Relationships between serum vitamin D3 levels and pulmonary function were identified by SPSS v.22 nonparametric Spearman's rank correlation.

Results. Mean vitamin D3 level during hospitalization was slightly higher (19.32 ± 8.36 ng/ml) than during ambulatory care visits (19.03 ± 9.94 ng/ml). Mean FVC (93.68 ± 22.39 %) and FEV1 (86.23 ± 24.99 %) during hospitalization were slightly lower than mean FVC (93.81 ± 17.65 %) and FEV1 (88.17 ± 22.34 %) during ambulatory care visits. Serum vitamin D3 levels showed a significant correlation with FVC (ρ = 0.53, p = 0.023) and FEV1 (ρ = 0.55, p = 0.018) during hospitalization, but there was no significant correlation between these measurements during ambulatory care visits (p-value > 0.05).

Conclusions. The physicians should pay attention to serum vitamin D3 level because it has associations with pulmonary function. Decrease of lung function in children with CF might be slowed down if vitamin D deficiency will be diagnosed early and treated properly with adequate diet and vitamin D3 supplements.
VITAMIN D DEFICIENCY IN CHILDREN

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Keywords. Cardiovascular, immune function, sepsis.

Introduction. Vitamin D influences cardiovascular and immune function. We aimed to establish the prevalence of vitamin D deficiency in critically ill children and identify factors influencing admission 25-hydroxy vitamin D (25(OH)D) levels. We hypothesized that levels would be lower with increased illness severity and in children with serious infections.

Aim. Vitamin D is essential for bone health and for cardiovascular and immune function. In critically ill adults, vitamin D deficiency is common and associated with sepsis and with higher critical illness severity. The influence on pediatric critical illness is unclear. We found a high prevalence of vitamin D deficiency in critically ill children, which was associated with higher critical illness severity. Vitamin D deficiency was less common in younger patients, in non-Hispanic white patients, in patients admitted over the summer, and in children taking supplemental vitamin D, with increasing amounts being more protective.

Materials and methods. We screen children admitted to the medical-surgical PICUs from November 9, 2009 to November 9, 2010. Eligibility criteria included the following: (1) age, 21 years and (2) estimated PICU stay of 48 hours (excluding short-term monitoring patients) or admission due to a probable infection. Patients admitted to the cardiac ICU were excluded because of high incidence of cardiac bypass, which can lower 25(OH)D levels. 36 The Children’s Hospital Jagriti institutional review board approved the study. After obtaining informed consent, parents or guardians were interviewed about their child’s racial and ethnic background, sun exposure, and intake of vitamin D containing foods and supplements by using a questionnaire adapted from a previous vitamin D study.

Results. We enrolled 211 of 318 (62.5%) eligible children. The median 25(OH)D level was 22.5 ng/mL; 40.1% were 25(OH)D deficient (level, 20 ng/mL). In multivariate analysis, age and race were associated with 25(OH)D deficiency; summer season, vitamin D supplementation, and formula intake were protective; 25(OH)D levels were not lower in the 238 children (46.6%) admitted with a life threatening infection, unless they had septic shock (n = 51, 10.0%) (median 25(OH)D level 19.2 ng/mL; P = 0008). After adjusting for factors associated with deficiency, lower levels were associated with higher admission day illness severity (odds ratio 1.19 for a 1-quartile increase in Pediatric Risk of Mortality III score per 5 ng/mL decrease in 25(OH)D).

Conclusion. We have identified a high prevalence of vitamin D insufficiency, deficiency, and severe deficiency in critically ill children admitted to the PICU and an inverse association between 25(OH)D levels and illness severity on admission. Pre-PICU dietary intake of vitamin D in the form of vitamins or formula protected against deficiency. We hypothesize that higher 25(OH)D levels may decrease the severity of critical illness brought on by an overwhelming insult such as infection or injury. Whether aggressive vitamin D supplementation in the early stages of critical illness improves clinical outcomes merits additional testing, given the high rate of vitamin D deficiency in critically ill children and the essential role of vitamin D in healthy bone development, we recommend screening critically ill children with risk factors for vitamin D deficiency and identifying effective repletion strategies.
ETIOLOGY AND CLINICAL PRESENTATION OF ACUTE MENINGITIS IN CHILDREN HOSPITALIZED IN CHILDREN’S CLINICAL UNIVERSITY HOSPITAL FROM 2006 TO 2016

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Keywords. Acute meningitis, children.

Introduction. Acute meningitis is an inflammation of the meninges with a global distribution, most commonly caused by a viral or bacterial infection. Bacterial meningitis is a serious, life-threatening infection, whereas viral meningitis tends to be a less severe disease. The clinical manifestations can be variable, nonspecific, even absent. The physical findings and prognosis in meningitis depend on the age of child, causative agent and severity of illness.

Aim. The aim of this study was to review the etiology, clinical presentation and early signs and symptoms of acute meningitis in hospitalized children aged from one month to eighteen years.

Methods. The retrospective, descriptive study was done by using medical records of all children admitted in Children’s Clinical University hospital of Riga with acute meningitis during the period from 2006 to 2016. Data concerning etiology and clinical presentation were reviewed and analyzed by using MS Excel.

Results. A total 408 patients were included in this study, 67% (n = 275) male, 33% (n = 133) female. Patients were divided into six groups according to their age. The meningitis was diagnosed most common in children six to eleven years, 32% (n = 131) respectively. The lowest frequency of meningitis, 8% (n = 33; n = 34), was diagnosed in infants (range 1–12 months) and toddlers (range 1–3 years). 68% (n = 293) of all patients were hospitalized during the summer and early autumn. 58% (n = 234) of patients were admitted to the emergency department within first 48 hours of onset of illness. Headache was present in 77% (n = 314) of all patients, 71% (n = 291) had vomiting and 65% (n = 266) had episode of fever. 31% (n = 127) of patients had subfebrile or normal temperature. In 16% (n = 65), patients had altered mental status, seizures were present in 5% (n = 19). Meningeal signs were positive in 84% (n = 341) and petechiae were observed in 11% (n = 46) of all patients. Lumbar puncture was performed in 94% (n = 384) of all cases. In 71% (n = 290) of all patients, the etiology of acute meningitis remained unknown. 17% (n = 69) were caused by bacterial and 12% (n = 49) by viral agents. Most common detected bacterial agent was N. meningitidis (11%; n = 43), enterovirus was most common detected viral agent (11%; n = 45).

Conclusion. The most common detected bacterial agent is N. meningitidis and viral agent enterovirus, however, majority of all patients the causative agent of acute meningitis remains unknown. In this study patients experience symptoms like fever, headache, vomiting, changed mental status, meningeal signs, seizures and petechiae. The most frequent symptoms are fever, headache, vomiting and meningeal signs.
CLINICAL, MOLECULAR BIOLOGICAL AND MICROBIOLOGICAL ANALYSIS OF ACUTE COMPLICATED AND UNCOMPLICATED APPENDICITIS IN CHILDREN

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Keywords. Appendicitis, microbiome, biomarkers.

Introduction. Although non-surgical treatment is proven successful especially in cases of acute uncomplicated appendicitis (AnA) in children. One of the major emerging problems in paediatric emergency is differentiation of AnA from acute complicated appendicitis (AkA) in early stages of the disease. At University Children’s Hospital, last statistical review reveals tendencies of the total amount of yearly operated acute appendicitis (AA) cases remains unchanged, however the number of AkA cases is increasing (Kakars et al., 2016). Prevention of delayed diagnosis and late onset of proper treatment is of major concern in avoiding complications. New emerging biomarkers NGAL (Neutrophil gelatinase associated lipocal) (Bakal et al., 2016) and LRG (leucine-rich alpha glycoprotein-1) (Rainer et al., 2016) in blood serum and urine may allow early diagnosis in AkA. Recent studies also suggest that the microbiome in the appendix plays a major role in its etiopathogenesis of acute appendicitis (Giunane et al., 2013)

Aim. To establish new criteria for the early diagnosis of AkA and AnA and provide knowledge contributing to the etiopathogenesis of said conditions.

Methods and materials. This prospective single centred randomised, controlled study is planned from early 2018–2020. Three patient groups with 30 patients each, surgically treated AkA, surgically treated AnA and control group. Based on surgical findings patients are divided into 2 study groups AkA and AnA. We will determine the levels of biomarkers NGAL and LRG in blood serum, and LRG in urine sample for all groups. Patients in both study groups will be continually screened for biomarker NGAL and LRG on second, fourth and sixth post-operative day. Furthermore, microbiological cultures will be obtained during surgery to check for microbiome analysis of the appendix in AnA and AkA patient groups. Bacteriological blood cultures were also performed in these groups. In all patient groups blood serum antibody levels of Yersinia enterocolitica will be performed. Results will be analysed by statistical means.

Results. Currently, the study is in its preliminary stages so it is hard to come up with any primary results. Samples are being obtained presently as this is a long-term study.

Conclusion. Expected results in biomarker findings and evaluation of microbiological profile, especially the role of Yersinia enterocolica as one of the pathogens, will allow a better understanding of etiopathogenesis of AkA. Enhancement of diagnostic accuracy and timing will improve prognosis of disease. It also allows reduction in post-operative complications of surgically treated acute appendicitis.
DIAGNOSTICS AND TREATMENT OF NECROTIZING ENTEROCOLITIS IN LATVIA YEAR 2010–2016

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Keywords. Necrotizing enterocolitis, prematurity, Bell’s criteria, intestinal pneumatosis.

Introduction. Necrotizing enterocolitis (NEC) is the most common gastrointestinal surgical emergency in the neonatal period, with prematurity as the single most important risk factor. The overall reported incidence is 0.1 % of all live births, and 3–12 % of very low-birth-weight infants (< 1500 grams). NEC typically occurs in the first few days of life with the initiation of enteral feedings. Treatment consists of orogastric tube decompression, broad-spectrum antibiotics and in advanced cases – surgical management. The decision of treatment depends on Bell’s staging criteria.

Aim. To find out the incidence of NEC in Latvia, to see the most common radiological findings and most frequently received treatment.

Materials and methods. A retrospective study was made including medical history data from all NEC patients in Neonatal Intensive Care Unit in Riga, from year 2010 to 2016.

Results. In the time period from year 2010 to 2016 there were 122 cases of NEC. The overall incidence of NEC in Latvia was 0.10 % of all live births, and 16.2 % of very low-birth-weight infants. The highest incidence was found in year 2010, when it was 0.13 % of all live births. Almost all of the patients (92.6 %; n = 113) were born premature. Males and females were affected equally. The average onset of NEC was at the age of 8 days. Out of all cases – 32.8 % (n = 40) of patients had no data of NEC in abdominal x-ray and/or ultrasound and only 18.9 % (n = 23) had intestinal pneumatosis. According to Bell’s staging criteria – 26 % (n = 32) of the patients were classified as Stage III (i. e. advanced NEC). In 72.1 % (n = 88) of cases the treatment was nonsurgical – including antibiotics and orogastric tube decompression. The most commonly used surgical treatment was resection of the ischemic bowel and enterostomy (12.3 %; n = 15), followed by peritoneal drainage combined with resection of the ischemic bowel (6.6 %; n = 8), peritoneal drainage alone (5.7 %; n = 7) and resection of the ischemic bowel and primary anastomosis (3.3 %; n = 4). The mortality in our research group was 27.9 % (n = 34), although the cause of death in these cases is usually associated with poly morbidity.

Conclusion.
1. The incidence of NEC in Latvia is 0.1 % of all live births – the same as mentioned in literature.
2. NEC was more common in preterm neonates and those with very low-birth-weight.
3. The most commonly used treatment was nonsurgical, as most of the patients were classified as Stage I and II according to Bell’s staging criteria.
TREATMENT APPROACH OF PANCREATIC INJURY IN CHILDREN’S HOSPITAL, AFFILIATE OF VILNIUS UNIVERSITY HOSPITAL SANTAROS CLINICS

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**Keywords.** Pancreatic injury, operative treatment, conservative treatment.

**Introduction.** As the incidence of children sustaining blunt pancreatic trauma is low, the treatment of such injury remains controversial. In the past decade there has been an ongoing debate, whether the optimal approach is operative intervention or conservative treatment.

**Aim.** To investigate the trauma mechanism, demographic data, results of laboratory tests as well as treatment approach and its outcome of patients admitted to Children's Hospital, Affiliate of Vilnius University Hospital Santaros Clinics due to pancreatic trauma from 2011 to 2017.

**Materials and methods.** Retrospective analysis of 9 case histories of children admitted to Children's Hospital, Affiliate of VUHSK due to pancreatic trauma from 2011 to 2017 was carried out. Data was evaluated using Microsoft Excel and IBM SPSS Statistics 24 programme.

**Results.** The mean age of patients was 9.6 years. The dominant trauma mechanism – blunt injury caused by a fall from bike (n = 5). Leukocytosis after trauma was observed in all patients (the average 15,76 × 10⁹/l ± 7,77). Anemia was seen in 55.5% of cases (n = 5). Since specificity of amylase in greater in children, alfa-amylase levels in urine were evaluated in our study. The average alfa-amylase levels of all patients were 449.7 U/L ± 213.0. Operative treatment was applied to 77.8% of patients (n = 7), while the rest were treated conservatively. The average length of stay in ICU in the operated group – 5.57 ± 2.2 days compared to 2 ± 2.2 in the conservative treatment group, but according to T-test the difference is not statistically significant (p = 0.135). The average length of hospitalization in operative treatment group – 29.7 ± 5.2 days and 25 ± 5 days in the conservative treatment group. However, the performed T-test showed that length of stay in hospital in two groups does not differ statistically significantly (p = 0.534). Antibacterial treatment was given to 77.8% patients with co-amoxiclav and cefuroxime being the most often used antibiotics (each used 28.6% of times). There was no dominant operative method in the treatment of pancreatic trauma, it ranged from laparoscopy to laparotomy in various cases due to severity of injury. Such treatments as marsupialization, drainage and cystectomy of pancreatic pseudocyst were also observed.

**Conclusion.** In Children's Hospital, Affiliate of Vilnius University Hospital Santaros Clinics operative approach remains dominant treatment of pancreatic injury. However, according to our data, in our hospital, the length of stay in ICU or hospital does not differ significantly between the operative and conservative treatment groups.
INFLUENZA VIRUS SIGNS AND SYMPTOMS IN PAEDIATRIC PATIENTS

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Keywords. Influenza, children, symptoms.

Introduction. Influenza virus is one of the most common pathogens to cause acute respiratory infections. It is a highly contagious airborne disease that manifests as an acute febrile illness with variable degrees of systemic symptoms. Typical symptoms include the following: coughing or other respiratory symptoms, gastrointestinal symptoms such as abdominal pain, diarrhea or sickness, myalgia, headache, red and watery eyes, weakness and severe fatigue. According to the World Health Organization, influenza epidemics result in 3–5 million cases of severe illness and more than 0.2 million deaths every year. For this reason, an influenza infection is a major health problem and is particularly significant in children with neurological and neurodevelopmental conditions or those younger than 5 years old. The gold standard for diagnosing influenza A and B is a polymerase chain reaction. However, due to the limited availability of this test, the diagnosis of this infectious disease is based on physical examination findings and typical laboratory parameters such as leukopenia, relative lymphopenia and thrombocytopenia.

Aim. The aim of this study was to analyze the clinical signs, laboratory blood parameters and the incidence of typical blood test changes in children of different age groups, diagnosed with influenza to determine the significance of these changes in influenza diagnostics.

Materials and methods. A retrospective study from November 2016 to March 2017 was carried out to analyze the disease records of 421 children diagnosed with the influenza A or B virus in the Children’s Hospital, Affiliate of Vilnius University Santaros Klinikos. Their diagnoses were confirmed by antigen detection and/or a polymerase chain reaction. Data that was collected for this study included demographic parameters such as a child’s age and gender, laboratory test results (total leukocyte count, hemoglobin, platelet count, C reactive protein) and clinical data (complaints, history of the disease, complications if present, concomitant chronic illnesses and use of antibiotics in a past few months). Statistical analysis was performed using the SPSS v23.0 software package. Qualitative data was described in terms of frequency, quantitative – in terms of men, standard deviation, minimum and maximum values. The significance of the data was checked according to the Chi-square criterion and the difference was considered statistically significant when p < 0.05.

Results. Influenza virus affected 237 (56.3 %) boys and 184 (43.7 %) girls. Children were divided into five age groups: up to 2 years old – 115 (27.3 %), 2–3 years – 33 (7.8 %), 4–6 years old – 91 (21.6 %), 6–12 years – 136 (32.3 %), > 12 years – 46 (10.9 %). During this season, the incidence of children diagnosed with influenza A was 363 (86.2 %), B – 58 (13.8 %). Influenza B was statistically significantly more frequent in boys aged 4–6 (p = 0.045). On average, patients would go to the emergency department on the 2nd–3rd day of the illness. 342 (81.3 %) patients came to the hospital during the first 3 days of illness and 67 (15.9 %) patients – after the 3rd day, the data of 12 patients referring to a medical institution remains
unknown. 102 (24.2 %) children were hospitalized, more than half of those were boys (57, 55.9 %). Hospitalizations among children under 2 years of age were statistically significantly more frequent (38 (37.3 %), p = 0.007). The most common complaints were fever 413 (98.1 %) – mean temperature 38.8 °C (SD – 0.0391), cough 254 (60.4 %), runny nose 206 (48.9 %), vomiting 82 (19, 5%), pharyngeal pain 55 (13.1 %), headaches 58 (13.8 %). Up to 10 % of children complained of abdominal, muscular, eye pain, rashes, nausea, or diarrhea. Statistically significantly more frequent cases of head, pharyngeal and muscular pain were reported in children older than 6 years (p = 0.00). Physical examination findings included: changes in the pharynx and tonsils were present in 279 (66.3 %) children, 95 (22.6 %), lymph nodes 33 (7.8 %), pathological auscultation data 65 (15.4%). There were no statistically significant differences in the physical examination findings between the age groups. Analysis of the blood test results revealed that leukopenia was found in 70/421 (16.6 %) children, most frequently in the group of children under 2 years of age (28/115, 24.3 %) and more frequently found in patients who were diagnosed with the influenza B virus (15/58, 25.9 %) or who went to a treatment facility during the first 3 days of the illness. Leukocytosis was detected in 38/421 (9 %) children, more common in children aged 2–3 years (6/33, 18.2 %). There was no coherence between the changes in the blood test and the clinical symptoms.

**Conclusion.** Our study found a statistically significant increase in the incidence of influenza B among boys aged 4 to 6 years (p = 0.045). As for influenza A – the incidence did not differ between age groups and sex. The most common cause for children to go to a treatment facility was febrile fever (98.1 %), coughing (60.4 %), runny nose (48.9 %) and vomiting (19.5 %). Children older than 6 years of age complained of headaches, muscles, sore throats more often, whereas pain-related complaints were rarely present among children younger than 3 years. Children under 2 years of age were more frequently hospitalized (p = 0.007), boys more often than girls. Leukopenia was observed in 16.6 % of children, more often in the age group up to 2 years of age. Leukocytosis was present in 9 % of patients and was more common in children aged 2–3 years.
OUTCOME OF WILMS TUMOUR IN CHILDREN TREATED AT VILNIUS UNIVERSITY HOSPITAL SANTAROS KLINIKOS, LITHUANIA

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Keywords. Wilms tumour, nephroblastoma, epidemiology, clinical presentation, survival, overall survival (OS), event free survival (EFS).

Introduction. Childhood renal tumours account for around 7% of all childhood cancers. Wilms tumour (WT) is the most common childhood abdominal malignancy accounting for nearly 90% of renal cases, with an annual incidence of approximately 1 in 100,000 children. With early diagnosis and current multimodal treatment, approximately 80–90% of children with WT survive.

Aim. To assess current diagnostic approach and treatment results of patients with WT treated at the Center for Pediatric Oncology and Hematology in Children’s Hospital, Affiliate of VULSK and to compare the results of previously published study.

Materials and methods. A retrospective medical record review of 48 patients diagnosed with WT between 2000 and 2017 was performed. Patients data were retrieved from paper and electronic patients records (when available). We analyzed the prevalence of patients by age, sex, stage of the disease, clinical presentation at the diagnosis and histological type, implying classification of the cases into the risk groups: low, intermediate, high. An estimated 5-year overall survival and 2-year event-free survival by stage and risk groups was calculated IBM SPSS v.20 work package.

Results. Among the 48 cases, girls were more frequently affected than boys. The most common patients’ age at the time of diagnosis was 2 – 4 years (52%). The most frequent symptoms were pain (48%), fever (33%), palpable abdominal mass (30%), abdominal swelling (28%). At the time of diagnosis stage I was found in 37.5%, II in 25%, III in 25% and IV in 12.5% of children. Risk groups according histological type were distributed as follow: 15% were considered as low risk, 77% were intermediate risk and 8% were high risk. The 5-year OS of all analysed children was 87.5%. The 5-year OS according to the stage was 100% in stage I, 91.7% in stage II, 83.3% in stage III, 50% in stage IV. With regard to the risk group the 5-year OS was 100% in low risk group, 91.9% in intermediate risk group, and 25% in high risk group. The 2-year EFS of all analysed children was 85.4%. The 2-year EFS according to the stage was 94.4% in stage I, 91.7% in stage II, 83.3% in stage III, 50% in stage IV. The 2-year EFS according to the risk group was 100% in low risk group, 89.2% in intermediate risk group, and 25% in high risk group.

Conclusion. We conclude that WT was diagnosed at early stages in most cases in contrary to the previous study. The survival depends on the stages at the time of diagnosis and the risk group – OS and EFS was better among the patients diagnosed in earlier stages and with favourable risk group.
A REVIEW OF CHILDREN WITH DUCHENNE MUSCULAR DYSTROPHY

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Keywords. Duchenne, muscular dystrophy.

Introduction. Duchenne muscular dystrophy (DMD) is an X-linked disease of muscle caused by an absence of the protein dystrophin. DMD is the most common and severe illness affecting from 15.9 to 19.5 per 100,000 live births.

Aim. To analyse symptoms the course of the disease, tests and treatment data in children with DMD.

Materials and methods. A retrospective study, which included 17 boys with DMD treated and monitored at the Children's Hospital, was performed in Affiliate of Vilnius University Hospital Santaros Clinics at the Center for Rare Paediatric Nervous and Muscular Diseases. Data were analyzed with Microsoft Excel 2013 and SPSS v.20.

Results. The mean age of the boys was 11.6 ± 4.7 years. The onset of symptoms was from 1 to 6 years of age (mean 2.5 ± 1.4), the diagnosis was established from prenatal period to 10 years. Genetic examination was performed on all patients, 10 (59 %) children's diagnosis was confirmed by genetic examination. Boys with DMD began to walk independently later than healthy population – at 15.4 ± 4.5 months. Steroid drugs were regularly used by 11 (65 %) patients, 4 (24 %) boys did not use due to parents' refusal, 2 were too young to use steroids. Steroids were started being used from 5 to 16 years old (average age was 8.5 ± 3.7 years). 11 (65 %) boys underwent regular rehabilitation. The average blood level of creatine kinase (CK) in boys from 0 to 10 years old was 15523 U/L, 10–15 years old – 4339 U/L, 15–17 years old – 1756 U/L. The mean vitD3 blood level was 43.4 ng/ml.

Conclusion. The average time between DMD symptoms manifestation and disease diagnosis was 2 years. DMD diagnosis was not confirmed genetically in 7 children. The highest blood level CK was found in children between 0 and 10 years old. Steroids is usually started being used later.
A WEIGHT CORRECTION PROGRAM OF CHILDREN’S CLINICAL UNIVERSITY HOSPITAL EFFICACY IN OVERWEIGHT AND OBESE CHILDREN AND ADOLESCENTS

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Keywords. Children, overweight, obesity, weight correction.

Introduction. Overweight and obesity has become an epidemic worldwide. If no intervention is done, extra weight in children tends to persist throughout the adulthood. Preventing further increase of BMI or even reducing it is the main aim of Weight correction program. The key for effective intervention is multidisciplinary approach to promote changing habits of the whole family. The surgical and pharmacological treatment is very limited in pediatric population. The best way of preventing excess weight problems in children is educating the society about the benefits of healthy diet and daily physical activity.

Aim. To evaluate the efficacy of a Weight correction program (Children’s Clinical University Hospital) for overweight and obese children and adolescents.

Materials and methods. Cross-sectional study is still being performed at Children’s Clinical University Hospital. There are 5–17 years old children with overweight and obesity included that have entered the Weight correction program. Respondents are divided into two groups according to age: < 10 years, ≥ 10 years. The anthropometric data from the first day of program and the last follow up visit are analyzed.

Results. 304 patients are included, 100 respondents have the follow-up anthropometric data gathered and analyzed by now. The mean age of whole sample was 11.9 ± 2.5 years. There were 48 (48 %) boys (mean age 12.3 ± 2.4 years) and 52 (52 %) girls (mean age 11.6 ± 2.7 years). 21 (21 %) children were < 10 years old, 79 (79 %) children were ≥ 10 years old. There were 8 (38 %) boys and 13 (62 %) girls in the youngest group. In the oldest group, there were 40 (51 %) boys and 39 (49 %) girls. The median BMI z-score in < 10 years old group was 3.1 (IQR 1.4) and the median BMI z-score in ≥ 10 years old group was 2.8 (IQR 0.9) at the beginning of program (p < 0.055). BMI z-score had increased to median 3.2 (IQR 1.0) in the youngest group and decreased to median 2.7 (IQR 1.0) in the oldest group at the last visit (p = 0.019). 9 (43 %) children in the < 10 years old group and 53 (67 %) in the ≥ 10 years old group had decreased BMI z-score at the last visit (p = 0.042). The difference between median BMI z-score on the first day of program and the median BMI z-score at the last visit was significant in the oldest group (p = 0.003), but not in the youngest group (p = 0.543).

Conclusion. More than a half (67 %) of the ≥ 10 years old children, but less than a half (43 %) of the < 10 years old children managed to reduce their BMI z-score. The benefits are more significant for ≥ 10 years old children than for < 10 years old children.
ASSOCIATION BETWEEN PHYSICAL ACTIVITY, SCREEN TIME AND GRADE POINT AVERAGE AMONG HIGH SCHOOL STUDENTS

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Keywords. Physical activity, academic performance, body mass index, screen time.

Introduction. Weight-related behaviors such as sedentary time, physical activity (PA) have been the focus of efforts to prevent obesity in children as it may negatively affect education. PA and its impact on academic performance have not been examined among students in Vilnius.

Aim. To determine whether PA, body mass index (BMI) or screen time have an impact on academic performance.

Methods. Prospective observational cross-sectional study enrolled students from 8 High Schools in Vilnius. A survey was administered to a cohort of students aged 13–18 years. Data from a questionnaire about behavioral risk factors, academic performance, PA were collected and volunteers were measured with body mass analyzer. The study population consisted of 570 adolescents (54.6 female) and was divided in 3 groups according to their grade point average (GPA): lower (< 6), moderate (average 6–8) and higher (8–10) GPA groups.

Results. Out of 570 surveyed students, 317 (55.6%) subjects had moderate GPA, 214 (37.5%) had higher GPA and 39 (6.9%) – lower GPA. GPA was significantly higher among female students (p < 0.001). Male students had higher screen time compared to females, respectively 3.64 ± 0.16 and 2.96 ± 0.12 hours (p < 0.001) same as lower GPA group (4.58 ± 0.59) compared to higher GPA (3.26 ± 0.16 hours) (p = 0.022). Students who spent more time using electronical devices were less likely to have moderate GPA (hazard ratio [HR] =1.2; 95% confidence interval [CI]: 1.1 to 1.35; p = 0.004). Higher BMI was related to greater chance of having lower GPA (HR = 2.94; CI: 1.54 to 5.64; p = 0.001). Higher GPA group were more likely to have higher lean body mass (HR = 1.04; CI: 1.01 to 1.07; p = 0.02) and higher heart rate (HR = 1.01; CI: 1.003 to 1.022; p = 0.007) compared to lower GPA students. Moderate GPA students spent more time being physically active compared to lower GPA (p = 0.012). PA, such as more time spent walking and intensive PA at home, is associated with better academic performance as physically active students had better chances to have moderate GPA (HR = 1.27; 95% CI: 1.05 to 1.55; p = 0.015).

Conclusion. Higher BMI, screen time and lower levels of physical activity had negative effect on High School students’ academic performance. Higher academic performance is associated with higher lean body mass and heart rate. However, higher levels of physical activity and lower screen time did not increase students chances of having grade point average higher than 8.
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RISK FACTORS FOR CONTACT LENS-RELATED EYE INFECTIONS AMONG PEOPLE IN LATVIA

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Keywords. Contact lens, infection, risks.

Introduction. Although contact lens is one of the safest medical device, 6% of contact lens wearers in US experience mostly minor but occasionally sight-threatening complications (Ehlers et al., 2014). Eye infections can be prevented by identification of risks and adequate lens wearing and hygiene.

Aim. To evaluate and to compare contact lens wearers' risk factors and care behaviors with subjective eye symptoms and occurrence of complications.

Materials and methods. 428 contact lens wearers were interviewed by using questionnaire. Survey included questions about respondents’ duration of use of contact lenses, risk/care behaviors, eye symptoms and information about need of acute ophthalmologist visit. Data were analyzed by using SPSS software.

Results. Study group consists of 428 contact lens wearers from which 365 (Confidence Interval (CI) of 95% = 0.81–0.88) (85.3%) was female, 63 (0.12–0.18; 14.7%) male. Mean age was 26.5 years, median age 25.0, SD = 6.3. Regular users were 287 (0.62–0.71) (67.1%), irregular 32.9%, between these groups were not statistically significant difference in risk behaviors and occurrence of infections.

From 9 risk behaviors that can cause infection only 4 (0.003–0.025) (0.9%) people had none. Mean risk factor count was 4. The most frequent risk behaviors were use of contact lens longer than recommended 294 (0.64–0.73; 68.7%), exposing lenses to water 279 (0.61–0.69; 65.2%), sleeping in lenses 241 (0.52–0.61; 56.3%), using contact lens solution more than once 240 (0.51–0.61; 54.0%). Other factors like not washing hands before touching lenses, using water instead of solution, keeping lenses outside the case were found in 158 (0.32–0.42; 36.9%), 44 (0.08–0.14; 10.3%), 24 (0.04–0.08; 5.6%) cases. Also, just 204 (0.43–0.52; 47.7%) people visit eye doctor yearly. 369 (0.83–0.89) people marked at least one eye symptom while wearing lenses. Common symptoms were grittiness (17.8%), blurred vision (17.1%), itching (15.2%). 59 (0.11–0.17) users had no complaints. Symptoms that may indicate development of serious complications like red, painful eye, light sensitivity, discharge from eye were found in 21 (0.03–0.07) cases.

Acute oculist visit was needed for 94 (0.18–0.26; 22.0%) people, they also reported more symptoms than other users (p = 0.01) but not more risk behaviors. There was not found significant correlation (p > 0.05) between risk behaviors and subjective symptoms that may indicate eye infection.

Conclusion. 91.9% contact lens wearers have at least one risk factor in their contact lens care that can lead to eye disease. Many of these respondents (369) reported eye symptoms although there was no significant correlation between these two factors.
CHARACTERIZATION OF PATIENTS WITH AGE RELATED MACULAR DEGENERATION IN CONJUNCTION WITH LOSS OF VISUAL ACUITY

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Keywords. Age related macular degeneration, visual acuity, quality of life.

Introduction. According to the World Health Organization age-related macular degeneration (AMD) is the leading cause of blindness in the Western world in people over 60 years and the third most common cause globally after cataract and glaucoma. AMD leads to loss of central vision needed for most activities in daily living and can make it more difficult for people to live independent lives (Mitchell et al, 2006).

Aim. The aim of our study was to evaluate the quality of life in persons affected by AMD.

Materials and methods. Prospective study was conducted in Pauls Stradiņš Clinical University Hospital Ophthalmology ward from December 2016 till April 2017 by participants of student scientific interest group of ophthalmology with surveying total of 30 patients with diagnosed AMD about their vision and their abilities in everyday life using National Eye Institute Visual Function Questionnaire (VFQ–25). The visual acuity (VA) was assessed using Snellen chart and depending on VA of the better-seeing eye (BSE), participants were divided into 3 groups: group I (VA > 0.6), group II (VA 0.1–0.6), group III (VA < 0.1). Collected data was statistically analysed using Microsoft Excel 2016, IBM SPSS 25.0.

Results. The mean age of the 30 participants (83.3 % female, 16.7 % male) was 79.80 (95 % confidence interval 76.81, 82.79). Mean VA in the BSE was 0.42 (0.30, 0.54). 33.3 % (N = 10) of the participants had a good vision (group I), 36.7 % (N = 11) had mild to moderate vision impairment (group II) and 30.0 % (N = 9) had severe vision impairment (group III). The mean index scores of the VFQ–25 were 81.79 (69.28, 94.30), 56.91 (45.54, 68.27) and 52.58 (39.36, 65.80), respectively. According to the Spearman's correlation test, statistically significant strong positive correlation between the BSE VA and the VFQ–25 overall index score were found (r_s = 0.75, p < 0.0001). The comparison showed a significant difference in 8 out of 11 subscales (ocular pain, near, peripheral and distance vision, social functioning, dependency, mental health and role difficulties) between the subgroups (p < 0.05).

Conclusion. Reduced visual acuity is negatively associated with quality of life. While there was no significant difference between mild to moderate vision impairment groups, those with severely impaired vision reported significantly greater restriction of participation than the good vision group in 10 out of 11 subscales and the overall index score.
FIVE-YEAR OUTCOME OF INTRAVITREAL ANTI-VASCULAR ENDOTHELIAL GROWTH FACTOR THERAPY FOR NEOVASCULAR AGE-RELATED MACULAR DEGENERATION

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Keywords. Macular degeneration, AMD, intravitreal therapy, anti-VEGF.

Introduction. Age-related macular degeneration (AMD) is an age-related degenerative disease of the central retinal area with visual impairment, which can lead to blindness. AMD is the first cause of blindness in developed countries and third in the world. Anti-vascular endothelial growth factor (anti-VEGF) therapy is the main treatment of AMD, which is intravitreal injections, aiding in vascular normalization.

Aim. The aim is to evaluate five-year outcome of intravitreal anti-VEGF therapy in eyes with neovascular age-related macular degeneration (nAMD).

Materials and methods. Retrospective study included 230 patients with nAMD who were on treatment with anti-VEGF therapy (ranibizumab Lucentis®, bevacizumab Avastin® and aflibercept Eylea®). 217 patients were involved in final analysis. Up to 5 years of collected data were extracted from Vilnius Santaros Center of Eye Diseases to a database using an electronic medical record system. The following data were recorded for each patient: age during the first injection, gender, the number of performed intravitreal injections during 5 years and visual acuity (VA) before treatment and up to 5 years of therapy (3, 6, 12, 24, 36, 48, 60 months). Statistical analysis was performed using SPSS program, significance level was set at \( p < 0.05 \).

Results. 217 eyes were examined. Female to male ratio was 2.6:1. The mean age during the first injection was 71.8 ± 8.0 (from 50 to 87 years). The mean VA before the treatment (baseline) was 0.43 ± 0.22 by Snellen chart, after 3 months - 0.52 ± 0.24 (0.09 ± 0.17 in comparison with the baseline) and after 6, 12, 24, 36, 48, 60 months were accordingly 0.49 ± 0.23, 0.45 ± 0.23, 0.40 ± 0.23, 0.35 ± 0.23, 0.33 ± 0.23, 0.30 ± 0.23. Mean VA statistically significantly differed (\( p = 0.00 \)) and did not depend on gender and age (\( p > 0.05 \)). The percentages of patients, who had no decline of VA by more than 1 row by Snellen chart after 3, 6, 12, 24, 36, 48, 60 months, were respectively 89.9 %, 84.3 %, 79.3 %, 70.5 %, 58.5 %, 53.9 %, 50.7 %. The mean number of injections in 5 years was 14.9 ± 8.1. A total number of injections did not depend on VA before the treatment (\( p > 0.05 \)) and did not correlate with variation of VA after 5 years (\( r = 0.152; p > 0.05 \)).

Conclusion. Five-year anti-VEGF therapy effectively improves visual acuity after initial injections. The best results were after 3 months. Patients’ eyesight stabilized for at least 12 months and after 2 years the baseline visual acuity is achieved. After 5 years about half of the patients have avoided significant decrease of visual acuity.
ASSOCIATION BETWEEN RETINAL THICKNESS
AND RETINAL PIGMENT EPITHELIUM ATROPHY IN
AGE-RELATED MACULAR DEGENERATION

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Keywords. Age-related macular degeneration, retinal pigment epithelium, atrophy, thickness.

Introduction. Age-related macular degeneration (AMD) is a leading cause of severe vision loss among older adults worldwide. It affects the central area of retina known as the macula. The two forms of AMD, neovascular age-related macular degeneration (wet) and dry, is classified based on the presence of blood vessels that have disruptively invaded the retina. The gold standard treatment of wet AMD consists of intravitreal injections of anti-vascular endothelial growth factor (VEGF) medications. (Smith et al., 2014).

Aim. To evaluate the association between retinal thickness and retinal pigment epithelium (RPE) atrophy in patients with AMD undergoing 24 months of anti-VEGF therapy.

Materials and methods. A retrospective study was done in Pauls Stradiņš Clinical University Hospital. 40 patients were included. Heidelberg Spectralis Optical Coherence Tomography (OCT) was used for atrophy area and retinal thickness measurements. The area of atrophy and retinal thickness was measured before, 12 and 24 months undergoing anti-VEGFF therapy. Obtained data was analysed using IBM SPSS Statistics Version 23.0 and Microsoft Excel 2016.

Results. The study was composed of 41 eyes of 40 patients, among them 29 (72.5%) were female and 11 (27.5%) male. The mean age of the patients was 81.68 ± 6.49. Right eyes were 19 (46.3%), left eyes 22 (53.7%).

The mean atrophy area before therapy was 1.58 μm² ± 2.65 and mean retinal thickness was 421.07 μm ± 131.3. The mean number of anti-VEGF injections in 24 months were 10.78 ± 4.9.

RPE atrophy area enlargement after 24 months was statistically significant from 1.58 to 2.73 μm² (p = 0.046). There was statistically significant retinal thickness reduction in 24 months from 421.07 to 338.24 μm, p < 0.001 (One sample T-test). The mean atrophy area progression in 24 months was 126.8 ± 18% and the mean retinal thickness reduction in 24 months was 17.7 ± 25 %. There was no statistically significant correlation between RPE atrophy area and retinal thickness reduction after 24 months of anti-VEGF therapy (r = −0.043, p = 0.791).

Conclusion. There was statistically significant retinal thickness reduction in patients treated with intravitreal anti-VEGF injections after 24 months. Despite the therapy of intravitreal anti-VEGF, retinal pigment epithelium atrophy area was enlarged after 24 months. We found no statistically significant correlation between RPE atrophy area and retinal thickness reduction after 24 months of anti-VEGF therapy and atrophy area was still enlarging.
EFFECTIVENESS OF CATARACT SURGERY COMPARED TO
CONVENTIONAL PHACOEMULSIFICATION AND FEMTO
LASER-ASSISTED CATARACT SURGERY

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**Keywords.** Femtosecond laser–assisted cataract surgery, phacoemulsification cataract surgery, cataract.

**Introduction.** Cataract surgery is the most commonly performed surgical procedure in the world. Phacoemulsification is the standard surgery procedure for cataract. Methods of cataract surgery are continuously improved. Femtosecond laser–assisted cataract surgery (FLACS) has been introduced into phacoemulsification cataract surgery to perform corneal incisions, capsulorhexis, and nuclear fragmentation. Lens fragmentation and softening with femtosecond laser before phacoemulsification is a primary advantage of FLACS over conventional surgery.

**Aim.** Through the retrospective data analysis, examine and compare the effectiveness of cataract therapy, comparing visual acuity and intraocular pressure among patients after conventional cataract surgery and FLACS.

**Materials and methods.** The study was conducted at the Dr. Solomatin eye rehabilitation and vision correction center. The study included 140 patients (140 eyes). The average age of all the patients was 64.2 ± 3 years. Visual acuity and intraocular pressure was measured in three phases - first day, two weeks and one month after the surgery. Data were analysed statistically using SPSS statistics analysing software, using descriptive statistical methods, also “p” value was calculated.

**Results.** Comparing visual acuity changes after conventional cataract surgery first day average visual acuity was 0.3, but after FLACS – 0.5. Similarly after two weeks of surgery visual acuity respectively was 0.5 and 0.6. One month after surgery average visual acuity using conventional method was 0.5, but using FLACS – 0.7. There was statistically significant difference between these two groups (p < 0.001). Comparing intraocular pressure changes after conventional cataract surgery on a first day average intraocular pressure was 22.9 mmHg (CI 95% 21.0–24.9), but after FLACS – 19.7 mmHg (CI 95% 17.6–21.8). Two weeks after surgery intraocular pressure respectively was 17.49 mmHg (CI 95% 16.3–18.7) and 16.06 mmHg (CI 95% 14.8–17.3). One month after surgery average intraocular pressure after both methods were equal – 15 mmHg (CI 95% 14.2–15.8). Comparing intraocular pressure statistically significant difference between these two groups was found only first day after surgery (p < 0.001).

**Conclusion.** During postoperative period comparing conventional method of cataract surgery with FLACS method, visual acuity after FLACS method improved significantly. Intraocular pressure between these two methods didn’t show statistically significant difference, except first day after surgery. More randomized, blinded studies with long-term visual outcomes need to be performed to properly evaluate the efficacy of FLACS compared to the conventional cataract surgery.
DRY EYE SYNDROME AND LASER
IN SITU KERATOMILEUSIS

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Keywords. LASIK, dry eye syndrome, refractive surgery, ocular surface disease index.

Introduction. More patients choose laser correction to get rid of the use of eyeglasses or contact lenses, thus improving the quality of their life. Dry Eye Syndrome (DES) after Laser in situ keratomileusis (LASIK) is the most common side effect. The common causes for DES after LASIK is the iatrogenic damage to the corneal nerve fibre, as well as postoperative inflammation causing excessive secretion of lacrimal gland fluid. Fluctuation in vision, especially within the first two months is the most common symptom associated with DES after LASIK. Other symptoms can include - pain, irritation, foreign body sensation, redness.

Aim. To evaluate and compare the incidence of DES development and its severity after LASIK refractive surgery by conducting a prospective clinical study.

Materials and methods. The study has been conducted at Dr. Solomatin Eye Rehabilitation and Vision Correction Centre, and included 46 patients (92 eyes), aged 30.2 ± 2 years. Patients have been surveyed using Ocular Surface Disease Index (OSDI) questionnaires to evaluate the subjective complaints and DES presence in the preoperative stage. An objective examination has been held using Tears Break Up Time (TBUT) and Schirmer's test 1 day before laser correction, as well as on the 7th day after the surgery, to evaluate DES changes during perioperative period. The obtained data have been analysed applying analytical and comparative statistics methods, using SPSS software.

Results. In our study population (N = 46), mean age of 30.2 ± 2 years, 29 patients (58 eyes) had dry eye symptoms, 17 (34 eyes) were symptom free. Before LASIK 34.78 % of patients had mild, 26.09 % moderate, and 17.49 % severe DES. Schirmer’s test in group wits DES symptoms after LASIK decreased by 5mm (p < 0.001), also in group without symptoms the results decreased by 6mm (p < 0.001). If we compare TBUT test before and after LASIK, in both groups results decreased by 2 sek (p < 0.001).

Conclusion. Our research results were statistically significant. LASIK causes dry eye syndrome symptoms in symptom free group and aggravates symptoms in symptomatic group. For patients with preoperative dry eye, the ocular surface must be treated before surgery. Artificial tears and regenerative ointment can work well for DES in postoperative period.
SURGICAL VARIABLES PREDICTIVE OF DIFFICULTY OF MANDIBULAR THIRD MOLAR SURGERY

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Keywords. Third molar surgery, surgical variables.

Introduction. Difficulty assessment of third molar surgery is perhaps the most important individual factor to consider in referring cases of impacted third molars for specialists’ handling. The assessment is important not only in predicting surgical difficulty, but implies directly on patient’s surgical outcomes and recovery.

Aim. The aim of this cross sectional interventional study is to evaluate the surgical (clinical and radiological) variables and risk factors predicting the difficulty of mandibular third molar surgery.

Objectives.
1. To study the reliability of four widely employed indices for assessment of third molar surgery.
2. Individual significance of preoperative risk estimates in determining the difficulty of third molar surgery using regression analysis

Materials and methods. After approval from the ethical committee, patients with hard and soft tissue impacted mandibular third molars were taken up for this study at the Government Dental College, Calicut. The sample size included 68 patients (86 cases) for surgical removal of mandibular third molar. The procedure and evaluation were performed by a single operator. Patient’s informed consent was obtained prior to surgery and the source data was collected in a patient proforma (not attached in abstract), based on predefined inclusion and exclusion criteria.

Results.
1. Four widely employed assessment indices for third molar surgery that were compared against the elapsed time of surgery were Pederson's index (Pederson et al 1988), NEW index (Gbotolorun et al 2007), Yuasa's survey (Yuasa et al 2002), WHARFE's assessment (Mgregor et al 1985). Statistical significance was found Pederson's index, NEW index and WHARFE's assessment, however statistical significance was not obtained for Yuasa's survey. All three indices correlated (Pearson’s correlation) significantly, the degree of prediction was 35.2%, 34.9% and 34.7% for the New, Pederson index and WHARFE assessment respectively.

2. Among the 18 preoperative surgical variables (clinical and radiological) assessed for risk estimate, and determining the difficulty of the third molar surgery, six variables were consistently significant in assessing the difficulty. These statistically significant variables were Age, Retromolar space (RMS) available, Angulation of M3 (third molar), Contact with M2 (second molar), Crown width ratio, Point of application of elevator (PAE).

Conclusion. Though these preoperative indices are able to predict the surgical difficulty, the degree of prediction is still less than 40 percentage, which emphasizes us to revise our existing assessment indices using statistically significant surgical variables.
PREMATURE EXTRACTION OF PRIMARY TEETH AND IMPACT ON PERMANENT DENTITION

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Keywords. Premature extraction, primary teeth, decayed missing and filled teeth index, orthodontic treatment need, permanent dentition.

Introduction. Premature extractions of primary teeth could have various effects on primary dentition: difficulty eating solid food that can lead to vitamins and minerals lacking diet and moreover serious impact on the child's overall development, also impact on the quality of child's life, jaw growth dysfunction and possible development of sleep apnea. Premature extraction of primary teeth can also have an impact on permanent dentition: continuing caries activity in permanent dentition, possible development of malocclusion and further need of orthodontic treatment, additional expenses and extra time consumed for parents.

Aim. To identify the impact of premature extractions of primary teeth on space deficiency, crowding and other occlusion changes in the permanent dentition, and further need of orthodontic treatment. To find out the correlation between patient’s DMF index before the early treatment under general anesthesia and current DMF index.

Materials and methods. The child’s general and oral medial history is obtained from the parents regarding oral hygiene, diet and harmful habits that determine patient’s current caries risk (high, medium or low). From the patient’s clinical and x-ray examination of permanent dentition caries were obtained and the main indicator – DMF index for teeth and surfaces. Orthodontic measurements were obtained by cast analysis. Sagittal, vertical and transverse plane relations, lack of space and other abnormalities of the existing occlusion were determined based on the obtained diagnostic casts. IOTN index (Index of Orthodontic Treatment Need) was used during orthodontic analysis.

Results. All patients from the treatment group had high caries risk in primary dentition, 80 % of them the caries risk still remains high, and for 20 % – moderate. Before general anesthesia, all children had high DMF index – from 7 to 16, and it stayed consistently high in the permanent dentition – from 5 to 17. The need for orthodontic treatment according to the IOTN index used in this research applies to 70 % of the examined patients. 70% of children had teeth crowding in the upper jaw, but only 10 % – in the lower jaw. The most frequent malocclusion in the upper jaw is teeth crowding (70 %), that in several cases combines with rotations (40 %), supraocclusions (40 %) and infraocclusions (10 %), but rotations (50 %) are more frequently found in the lower jaw.

Conclusion. Children with high caries risk in the childhood, also have high caries risk in their adolescent years, as well as in case of premature primary molar extractions the need for orthodontic treatment is higher than in the average population. Riga Stradiņš University Institute of Stomatology plans to perform retrospective cohort study by selecting patients that have had premature primary teeth extractions under general anesthesia when they were 3 to 5 years old and now it can be examined and compared to the control group with people that have no history of premature primary teeth extractions. In order to plan out the cohort study, as well as the number of participants needed, a pilot study in the form of this research was done. The IOTN index determined in this research concludes that 70 % of the patients are in need of orthodontic treatment, 20 % are in moderate need and only one patient does not need orthodontic treatment. Possibly, when examining a larger treatment group, the IOTN index would decrease in percentage. However a larger treatment group and control group is necessary, since this research indirectly shows that premature extractions of primary teeth effect the need for orthodontic treatment.
INCIDENCE OF COMPLICATION OF CHILDREN WITH 
CHOLESTEATOMA FROM 2012 TILL 2016

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Keywords. Complication, chronic otitis media, cholesteatoma, pediatric.

Introduction. Cholesteatoma is a severe middle ear pathology, which can be either acquired during one’s lifetime or is congenital. In a majority of cases cholesteatoma is acquired, in comparison to congenital one (0.12 per 100,000 children). Cholesteatoma is a destructive lesion containing keratinizing squamous epithelial lining. There are 4 major theories describing pathogenesis of the cholesteatoma out of which invagination and epithelium invasion theories being the most widespread. As cholesteatoma is a chronic lesion it can result in several complications – erosion of the ossicles resulting in conductive hearing loss, sensorineural hearing loss (SNHL), labyrinthitis, mastoiditis, brain abscess, n. facialis palsy.

Aim. The research will analyse children with cholesteatoma and chronic otitis media. The focus will be on the following two items: frequency and complication type, and incidence rate of cholesteatoma between genders.

Materials and methods. The method applied is a retrospective descriptive study of patients who had chronic otitis media with cholesteatoma in the Children’s Clinical University Hospital (CCUH). The time period is 2012–2016. Data were collected from Andromeda database and analyzed by using IBM SPSS 23.0 software (Descriptive statistics, Compare means, Crosstabs, Fisher’s Exact Test).

Results. There were 128 cases of chronic otitis media in the selected time period. Out of 128 cases, 39 cases had complication cholesteatoma. In 2012 – nine patients, 2013 – two patients, 2014 – six patients, 2015 – 12 patients, 2016 – ten patients. Complications of cholesteatoma were developed in 42.5% of cases. 33% of patients had conductive hearing loss. Rare complications, such as mastoiditis (3 cases), abscess (1 case) occurred in less then 5% cases. The average age for girls who had cholesteatoma with complications – 13 years old (SD ± 1), boys – 12 years old (SD ± 1). From all patients who had complications, chronic otitis media occurred more often to boys (67.9%) than to girls (54.5%). Conductive hearing loss observed more frequently to girls (45.5%) than to boys (28.6%). Rare complications as mastoiditis and brain abscess were more common to boys, than to girls. Complication rate per one person differed. One complication occurred to 64.1% patients. Two or more complications occurred to 35.9% patients.

Conclusion. Cholesteatoma is a destructive disease, which goes together with complications such as conductive hearing loss for a lifetime. Fisher’s exact test confirmed that there is no significant difference between genders. Otorhinolaryngologists should emphasize to their patients the meaning of ear hygiene and ear protection from water. It is necessary to have more specific observation for patients with relapse of acute otitis media and secretory otitis media.
PRIMARY OTORHINOLARYNGOLOGICAL SYMPTOMS AND RISK FACTORS IN PATIENTS WITH CHOLESTEATOMA BEFORE RADICAL MIDDLE EAR SURGERY

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Keywords. Cholesteatoma, otolaryngological symptoms, radical middle ear surgery.

Introduction. In the case of chronic central otitis inflammation, the pathogenesis of which is based on the dysfunction of the Eustachian tube, there are retraction pockets that contribute to the formation of acquired cholesteatoma. Chronic otitis media (COM), eardrum injury, timpanostomy history, etc. can contribute to its formation. COM is treated conservatively with antibiotics and in severe cases (such as cholesteatoma), a radical middle ear surgery (RMES) is performed with reconstructive surgery for hearing loss.

Aim. The aim of this study was to analyze the occurrence of primary otolaryngological symptoms in patients with cholesteatoma before radical middle ear surgery, to identify risk factors, family anamnesis and complications after surgery.

Materials and methods. Retrospective descriptive study of patients who had cholesteatoma and underwent RMES in Pauls Stradiņš Clinical University Hospital between January 2016 and November 2017. IBM SPSS 23.0 software was used for statistical analysis.

Results. 55 patients were viewed retrospectively – 51% male (n = 28) and 49% (n = 27) female. Median age was 43 years (range 18–76 years). The most frequent symptoms were complaints about hearing loss 94.5% (n = 52), discharge from the ear 89% (n = 49), pain 11% (n = 6), vertigo 9% (n = 5). 18% (n = 10) had other complains. A part of the patients had cholesteatoma risk factors: deviated septum 51% (n = 28), active smokers 44% (n = 24), passive smokers 27% (n = 15), timpanostomy 18% (n = 10), arterial hypertension 18% (n = 10), eardrum injury 16% (n = 9), chronic rhinitis 13% (n = 7), nasal polyps 4% (n = 2). Some had COM in family history: parents 13% (n = 7), siblings 9% (n = 5), children 9% (n = 5). 36% (n = 20) of patients had cholesteatoma recurrence in a lifetime. There was found no significant correlation between risk factors and cholesteatoma diagnosis. In 60% (n = 33) middle ear ossicles were destroyed until base of stapes, in 15% (n = 8) – only malleus, incus. In 40% (n = 22) cases facial nerve was affected, in 20% (n = 11) – semicircular canals. The study does not reveal any statistically significant association between cholesteatoma diagnosis and age, gender, cholesteatoma risk factors or COM in family history (p > 0.05).

Conclusion. Cholesteatoma tends to affect both genders equally, usually in middle age. The most frequent otolaryngological symptoms are hearing loss and discharge from the ear. The most frequent cholesteatoma risk factor is deviated septum. Unlike described in medical literature, significant relevance between cholesteatoma diagnosis and evaluated risk factors was not observed. The complications after RMES were not found, indicating that surgery is relatively safe.
OTITIS MEDIA COMPLICATIONS IN CHILDREN’S CLINICAL UNIVERSITY HOSPITAL FROM JANUARY 1\textsuperscript{st} 2015 TO DECEMBER 1\textsuperscript{st} 2017

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Keywords. Otitis media, mastoiditis, mastoidantrotomy, paracentesis.

Introduction. Otitis media is one of the most common childhood diseases; it can result in mastoiditis, which can require surgical treatment, prolong hospital stay and lead to intracranial complications.

Aim. To retrospectively analyze patient records from Children’s Clinical University hospital who were hospitalized due to complications of otitis media, to analyze the length of the hospital stay, treatment and its duration, occurrence of intracranial complications and the need for surgical treatment.

Materials and methods. The research includes retrospective data of 31 patients’ records with mastoiditis who were hospitalized in Children’s Clinical University Hospital in the period from January 1\textsuperscript{st} 2015 to December 1\textsuperscript{st} 2017.

Results. Of 31 patients included in the study 29\% (n = 9) were female and 71\% (n = 22) male patients. The mean age was 6.5 (IQR = 5) years (M = 7.2, IQR = 8.3 for female and M = 6.2, IQR = 5.8 for male patients). The average hospital stay – 14 days (IQR = 7). If mastoidantrotomy (MA) was performed the average hospital stay was 15 days (IQR = 7.5), in cases of paracentesis – 12 days (IQR = 8). For patients without surgery and intracranial complications the average hospital stay was 8 days (IQR = 3). Average length of antibiotic therapy was 14 days, in 74.2\% (n = 23) the drug used was ceftriaxone, in 6.5\% (n = 2) cefuroxime, and combination of the two in 6.5\%. Amoxicillin was only used once. 15 patients received transtympanic medication. 16.1\% (n = 5) patients had received antibacterial therapy before admission.

MA was performed in 71\% (n = 22) and paracentesis in 51.6\% (n = 16) of the cases. Intracranial complications occurred in 16.1\% (n = 5), including: subperiostal phlegmon, subdural empyema, transverse and sigmoid sinus and jugular vein thrombosis, cerebral abscess, \textit{n. facialis} compression. Average hospital stay for these patients was 33 days. Etiological agents were identified in 17 patients, in 58.8\% (n = 10) of the cases it was \textit{Streptococcus} spp. of which 5 were \textit{S. pneumoniae} and 3 - \textit{S. pyogenes}. \textit{Staphylococcus} spp. was the agent for 29\% (n = 5), other microorganisms for 11.8\% (n = 2).

Conclusion. Mastoiditis is more frequent in children younger than 10 years. Patients who undergo surgery spend more than 10 days in hospital, contrary to those without surgery. Most commonly used antibiotic is ceftriaxone; if there are intracranial complications ceftriaxone is used in combination or replaced with vancomycin, metronidazole, meropenem, cefepime or ceftazidime. Most cases of mastoiditis require paracentesis and mastoidantrotomy. Despite antibacterial and surgical treatment intracranial complications can occur.
CLINICAL BALANCE TEST FOR ASSESSMENT OF BALANCE DYSFUNCTION IN CHILDREN WITH OTITIS MEDIA WITH EFFUSION

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Keywords. Balance, otitis media with effusion, BOT-2 test.

Introduction. Otitis media with effusion (OME) is a common childhood disease, which occurs with a fluid accumulation in the middle ear. Several studies have indicated that during an episode of OME children can undergo not only hearing problems but also vestibular dysfunction, for this reason they can become clumsy and fall more often. Despite the fact that, vestibular impairment can lead to balance deficit and disturb normal motor development, vestibular evaluation is not routinely performed in the pediatric population.

Aim. The aim of the study was to assess the balance ability in children with OME and compared with normal-hearing controls using clinical balance subset of the standardized Bruininks Oseretsky Test of motor proficiency, second edition (BOT-2).

Materials and methods. Children with OME were recruited from the Department of Otorhinolaryngology of the Hospital of Lithuanian University of Health Sciences Kaunas clinics in Kaunas. Middle ear status was confirmed through a variety of tests including: pneumatic otoscopy and examination of the eardrum, speech and pure tone audiometry, impedance testing and otoacoustic emission. All subjects underwent Balance subset of the BOT-2 test, which consist of nine balance-related tasks performed with eyes open and with eyes closed. Data were analyzed using SPSS v24 statistical package. A p value < 0.05 was considered statistically significant.

Results. The study involved 62 children: 32 (52 %) with OME and 30 (48 %) healthy children 4–12 years old. Balance abilities in one leg standing task with eyes open, were statistically significant better (p = 0.01) in control group (8.9 ± 1.4 sec) than in children with OME (7.9 ± 1.6 sec). The highly difference (p < 0.001) was observed performing one leg standing task with eyes closed, among control group (7.4 ± 1.6 sec) and children with OME(4.1 ± 1.5 sec). Similar results were obtained when standing on one leg on a balance beam with eyes open (8.4 ± 1.3 sec vs. 7.4 ± 1.9 sec, p = 0.03) or eyes closed (7.3 ± 1.4 sec vs. 3.5 ± 1.6 sec, p < 0.001). Gender and age have no significant effect on the balance function of the children with OME.

Conclusion. Children with OME showed significantly poorer balance abilities than control group. One leg standing tasks with eyes closed and eyes open are appropriate to identify the vestibular dysfunction in children with OME. BOT-2 test can help to detect balance disorders in these children.
ROLE OF METEOROLOGICAL PARAMETERS IN EPISTAXIS OCCURRENCE

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Keywords. Epistaxis, nosebleed, weather, climate, ENT.

Introduction. Epistaxis is a common Otorhinolaryngology emergency. The influence of weather on the occurrence of epistaxis is uncertain.

Aim. To reveal possible associations between the occurrence of epistaxis and meteorological parameters such as air temperature, atmospheric pressure, relative humidity, precipitation and wind speed.

Materials and methods. Collection of meteorological data from weather observation station in Riga International Airport. Retrospective analysis of medical records of patients presenting to the Emergency Department of Pauls Stradiņš Clinical University Hospital with epistaxis in 2016. IBM SPSS 22.0 software (Kruskal-Wallis test and Binary Logistic Regression analysis) was used; statistical significance was considered with $p < 0.05$.

Results. In 2016, 454 patients presented to the Emergency Department of Pauls Stradiņš Clinical University Hospital due to epistaxis. There were 253 (69.1%) days with at least one case of epistaxis. Median daily (5.8 °C), 3-day (5.1 °C) and 7-day (4.9 °C) temperatures on the days with epistaxis cases were lower than on days without any epistaxis case (12.9 °C, 12.5 °C, 12.6 °C respectively) ($p = 0.001$). Median daily (3.4 mmHg), 3-day (9.0 mmHg) and 7-day (16.1 mmHg) amplitudes of atmospheric pressure were higher on the days with epistaxis cases than on the days without any epistaxis case (2.7 mmHg, 6.4 mmHg, 12.7 mmHg respectively) ($p = 0.036$). Also, median daily, 3-day and 7-day relative humidity differed on the days with and without epistaxis cases (81 %, 81 %, 80 % and 78 %, 77 %, 77 % respectively) ($p = 0.046$). Comparing precipitation amount and wind speed on the days with and without epistaxis cases, no relevant differences were found.

Conclusion. Differences in air temperature, atmospheric pressure and relative humidity were statistically significant between days with and without epistaxis cases. The odds of patient presenting to the Emergency Department due to epistaxis are higher when air temperature is lower, atmospheric pressure amplitude is higher, and relative humidity is higher.
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MECHANICAL VENTILATION AUDIT TO ASSESS ADHERENCE TO A LUNG PROTECTIVE VENTILATION STRATEGY

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**Keywords.** Mechanical ventilation, lung-protective ventilation, intensive care unit.

**Introduction.** Although mechanical ventilation is an obligatory therapy for many critically ill patients, it may cause further lung damage or initiate new structural changes in prior healthy lungs. There is good evidence that all invasively ventilated patients should undergo lung-protective ventilation (LPV).

**Aim.** To audit the use of LPV strategy for mechanically ventilated patients in the intensive care unit.

**Materials and methods.** A 30-day prospective audit was carried out within two Intensive Care Units (ICUs) at University hospital. All invasively ventilated patients on a mandatory ventilation mode were included and ventilation parameters for each ventilated day recorded. Exclusion criteria were: patients ventilated for < 24 h, patients breathing spontaneously and patients using noninvasive ventilation. Data collected included patients’ demographics, ventilation parameters (tidal volume (Vt), fraction of inspired oxygen (FiO2), positive end expiratory pressure (PEEP)), arterial blood gases (partial pressure of oxygen and carbon dioxide (PaO2, PaCO2)) and hospital outcomes. Predicted body weight (PBW) was calculated and evaluated with the set tidal volume for each patient.

**Results.** Of the 44 patients (70.5% males, mean age 64.9 years) being ventilated on a mandatory mode, 200 data entry points were recorded. Twenty one percent were neurosurgery, 54.5% were cardiothoracic surgery, 24.5% other patients. In-hospital mortality was 50%, in-ICU mortality was 40.9%. PaO2 for 29 (65.9%) patients (and 66 cases) was above 100 mmHg. Assessing the registered hyperoxemia cases, 46.2% FiO2 and 43.4% PEEP parameters were changed. Thirty-three (16.5%) cases met the recommended FiO2 and PEEP combinations. Ninety two percent of the cases did not follow LPV strategy (Vt = 6 ml/kg) and Vt was above 6 ml/kg, in 60.3% of the cases Vt was not adjusted. Eleven percent of the cases were ECMO patients, for 36.4% of the cases hyperoxemia (PaO2 > 100 mmHg) was registered. The mean ventilation settings of ECMO patients were: Vt 0.402 ± 0.1 L, FiO2 39.5 ± 9.5 %, PEEP 8.1 ± 2.5 cm H2O, PIP 21.3 ± 4.7 cmH2O. For detected hyperoxemia in ECMO-treated patients, FiO2 was changed in 33.3%, Vt in 41.1% and PEEP in 66.6% cases.

**Conclusion.** Despite hyperoxemia detection in over half of the cases (60%), less than half of them had ventilator settings adjusted based on arterial blood gases. Variability in ventilation practice exists between the ICU’s and in most cases (90%) a safe ventilation protocol is not followed. Further studies are needed to detect the optimal LPV strategies for non-ARDS patients.
USE OF DYNAMIC LUNG COMPLIANCE FOR EVALUATION OF RESPIRATORY FUNCTION IN INTENSIVE CARE UNIT

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Keywords. Lung compliance, dynamic compliance, intensive care unit.

Introduction. Respiratory function is constantly monitored in Intensive Care and dynamic lung compliance is another variable that could reflect respiratory condition and guide to appropriate ventilator setting adjustment in order to provide both adequate oxygenation and safe ventilation.

Aim. To detect whether dynamic compliance can be used to monitor respiratory function and reflect certain clinical conditions.

Materials and methods. A 30-day prospective study was carried out in two ICUs at University hospital. All invasively ventilated patients on a mandatory ventilation mode were included. Data collected included patients' demographics, ventilation parameters (dynamic lung compliance (Cdyn), fraction of inspired oxygen (FiO\textsubscript{2}), tidal volume (Vt), respiratory rate (RR), inspiratory time (Tis), positive end expiratory pressure (PEEP), peak inspiratory pressure (PIP), plateau pressure (Pplat), mean airway pressure (Pmean), residual post-expiration volume (Vtrap), airway resistance (R), arterial blood gas parameters (partial pressure of oxygen (PaO\textsubscript{2}), carbon dioxide (PaCO\textsubscript{2}), PaO\textsubscript{2}/FiO\textsubscript{2} ratio, ventilation modes and daily fluid balance.

Results. Of the 44 patients (70.5\% males, mean age 64.9 years) ventilated on a mandatory mode, 200 data entry points were recorded. Twenty one percent were neurosurgery, 54.5\% were cardiothoracic surgery, 24.5\% other patients. Impaired oxygenation (PaO\textsubscript{2}/FiO\textsubscript{2} ≤ 300 mmHg) appeared in 25 (56.8\%) patients when PEEP was set ≥ 5 cm H\textsubscript{2}O. Mean ventilation parameters were: FiO\textsubscript{2} 49.8 ± 12.8\%, VT 0.482 ± 0.088 L, PEEP 6.7 ± 2.7 cm H\textsubscript{2}O. Mean PaO\textsubscript{2} was 129.2 ± 52.8 mmHg, PaCO\textsubscript{2} 40.1 ± 9.1 mmHg, PaO\textsubscript{2}/FiO\textsubscript{2} 269.4 ± 112.4. Positive correlation appeared between Cdyn and: PaO\textsubscript{2}/FiO\textsubscript{2} (p = 0.004), PaO\textsubscript{2} (p = 0.010), VT (p = 0.005), Tis (p < 0.001), body weight (p < 0.001), height (p = 0.020), PRVC/AutoFlow ventilation modes (p < 0.001). Negative correlation was observed between Cdyn and RR (p = 0.007), Pinsp (p = 0.019), Pplat (p = 0.001), PIP (p < 0.001), R (p = 0.005). There was no significant relation between Cdyn and age, gender, daily fluid balance, FiO\textsubscript{2}, PaCO\textsubscript{2}, PEEP, Pmean, Vtrap.

Conclusion. Dynamic lung compliance was associated with PaO\textsubscript{2}/FiO\textsubscript{2} and could be one of the parameters to monitor oxygenation. As dynamic compliance has a negative correlation with airway pressures, it can reflect some clinical conditions such as airway obstruction. Dynamic lung compliance was not associated with PEEP and further studies need to evaluate whether ventilation settings can be adjusted based on dynamic compliance.
TREATMENT AND SURVIVAL OF PATIENTS WITH PULMONARY THROMBOEMBOLISM IN LITHUANIA 2015–2016

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**Keyword.** Pulmonary thromboembolism.

**Introduction.** Acute pulmonary thromboembolism is a common and sometimes fatal illness with a wide range of clinical exposure. It is very important that treatment is given in time to prevent the reoccurrence of thromboembolism and death.

**Aim.** Determine which causes / factors determine the survival of patients with pulmonary thromboembolism.

**Materials and methods.** A prospective study was conducted in 2017 at the Vilnius University Hospital Santaros Clinics. All data of patients with pulmonary thromboembolism treated in VUH SC from 2015 to 2016 was collected and analyzed. The study involved 570 patients. 309 women (54.2\%, N = 570) and 261 men (45.8\%, N = 570). Pulmonary thromboembolism mortality was statistically independent of sex (p > 0.05). 52 patients died during treatment (9.1\%, N = 570). 109 patients had/have an oncologic disease (19.1\%, N = 570). Pulmonary thromboembolism mortality does not depend on whether the patient had/has an oncological illness or not (p > 0.05). 214 patients were treated in an intensive care department (37.5\%, N = 570). 89 patients had a sudden drop in blood pressure (15.6\%, N = 570). Right ventricular dysfunction (57.7\%, N = 570) was observed in 329 patients. Thrombolysis was performed in 33 cases (5.8\%, N = 570). Pulmonary thromboembolism mortality is statistically independent of whether thrombolysis (p > 0.05) was performed. The thrombus was removed mechanically in 3 cases (0.5\%, N = 570). Heparin treatment was administered to 228 patients (40\%, N = 570). Mortality of patients with pulmonary thromboembolism depends on whether the patient was treated with heparin (p < 0.05). Low-molecular-weight heparin was administered to 383 patients (67.2\%, N = 570). Mortality of patients with pulmonary thromboembolism depends on whether the patient was treated with low-molecular-weight heparin (LMWH) (p < 0.05). In the hospital, 446 patients received anticoagulant therapy (71.2\%, N = 570). Mortality of patients with pulmonary thromboembolism depends on whether the patient was treated with anticoagulants (p < 0.05). Ca-channel blocker was prescribed to 151 patients (26.5\%, N = 570). Mortality of patients with pulmonary thromboembolism depends on whether the patient was treated with Ca-channel blockers (p < 0.05).

**Conclusion.** Survival of patients with pulmonary thromboembolism depends on the medication prescribed. We did not find a statistically significant relationship between survival and thrombolysis.
TRANSTHORATIC ECHOCARDIOGRAPHY FOR ASSESSMENT OF CARDIAC RISK IN PATIENTS UNDERGOING MAJOR JOINT REPLACEMENT

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Keywords. Cardiac risk, transthoracic echocardiography, major joint replacement.

Introduction. Perioperative cardiac risk evaluation and patient optimization is an important part of preparation of patients for surgery. Transthoracic echocardiography (TTE) is a routine investigation for patients over 65 years undergoing the major joint replacement in Latvia but it is not known if it is the best tool to predict postoperative cardiac complications.

Aim. To describe TTE findings, their coherence with clinical symptoms and predictive value in patients undergoing major joint replacement surgery.

Materials and methods. A prospective study (2017–2018) included patients over 65 years undergoing major joint replacement surgery in Hospital of Traumatology and Orthopedics (TOS) in Latvia. Information about history of cardiac disease and laboratory data to calculate Revised Cardiac Risk was gained from the patients and case notes preoperatively. Preoperative TTE report was used to record ejection fraction, severe stenosis and regurgitations, wall motion abnormalities, left atrial volume index (LAVI) and severe valvular calcification. The extracted data was analyzed in MSExcel and SPSS.

Results. 83 patients met inclusion criteria. The median (IQR) age was 72.80% were male. 14% had history of significant cardiac disease and 3 had had invasive cardiac intervention. Median Revised cardiac index was 0.89 (IQR). 10.8% had pathological TTE findings. 9% developed postoperative cardiac complications – sinus bradycardia, paroxysmal atrial fibrillation, cardiac ischemia and hypotension. No correlation was found between preoperative TTE findings and presence of postoperative cardiac complications.

Conclusion. Significant proportion of patients undergoing major joint replacement have cardiac risk factors. In this study preoperative TTE findings did not predict risk of postoperative complications.
CARDIAC INTENSIVE CARE OUTCOMES AFTER CONGENITAL HEART SURGERY IN LATVIA

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Keywords. Congenital heart defect, cardiopulmonary bypass, postoperative outcomes, cardiac intensive care.

Introduction. Postoperative outcomes in children who undergo elective surgeries for congenital heart defects (CHD) requiring cardiopulmonary bypass (CPB) in Latvia have not been systematically measured.

Aim. The objective of this study was to analyze postoperative outcomes in Latvia.

Materials and methods. A retrospective descriptive study was done in the pediatric intensive care unit (PICU) of Children’s Clinical University Hospital where all CHD surgeries are performed in Latvia. All children (> 28 days old) who had elective CHD surgery requiring CPB from 2013 to 2016 were included. Neonates were excluded from the study, because their cardiac intensive care is provided in the neonatal intensive care unit in Latvia. Clinical data were collected from electronic medical records (IntelliVue Clinical Information Portfolio; Phillips). Predicted mortality was calculated by using Pediatric Index of Mortality 2 (PIM 2). All procedures were categorized 1–6 according to Risk Adjustment for Congenital Heart Surgery (RACHS) score. Postoperative complications were divided into cardiac and extracardiac.

Results. A total of 155 patients were included in the study; 88 (56.8 %) were male, 67 (43.2 %) were female. The median weight was 8.0 (IQR = 6.8–10.6) kg, while median age was 0.9 (IQR = 0.7–1.6) years. Median PICU stay was 6 days, median hospital stay after procedure – 10 days. Mechanical lung ventilation with median 2 days was required. Frequency of cardiac complications was as follows: cardiopulmonary resuscitation – 4 (2.6 %), need for reoperation within 30 days – 5 (3.2 %) from whom 2 were performed for haemostasis, 2 – for pacemaker implantation, 1 – for correction of a residual defect. Frequency of extracardiac complications: chylothorax – 13 (8.4 %), bleeding – 16 (10.3 %), renal replacement therapy – 1 (0.6 %), seizures – 2 (1.3 %). Hospital mortality – 1.9 %. Seven patients belonged to RACHS category 1, 103 – category 2, 37 – category 3, 7 – category 4, 1 – category 5 & 6. All three patients who died were in RACHS category 2.

Conclusion. The information obtained in these four years could give an important statistical information and provide analysis about the situation in Latvia. These results are particularly important for informed parental consent prior surgery and quality improvement initiatives. The chylothorax incidence of 8.4 % was unexpectedly high. Further investigation is needed to evaluate the causative factors.
QSOFA AND SIRS CRITERIA COMPARISON FOR PATIENTS DIAGNOSED WITH SEPSIS IN ICU

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Keywords. SIRS, qSOFA, Sepsis, ICU.

Introduction. Sepsis is defined as life-threatening organ dysfunction, which is caused by a dysregulated host response to the infection. In 1992 it was defined, that sepsis might be diagnosed by SIRS criteria or any other stimulus that activates inflammation and a presence of certain diseases. In 2016, a new clinical score called as a quick Sequential Organ Failure Assessment (qSOFA) for identification of patients with a risk of sepsis, was introduced.

Aim. The aim of the study was to analyze SIRS and qSOFA status for diagnosis of sepsis to find out the sufficiency of these criteria in Department of Anaesthesiology and Intensive Care of Pauls Stradiņš Clinical University Hospital during 2016.

Materials and methods. In a retrospective analysis, admission data from the ICU of the Pauls Stradiņš Clinical University Hospital (Latvia) were screened, to gather patients admitted for sepsis. In addition to clinical characteristics, qSOFA and SIRS criteria were assessed and evaluated with respect to the defined study outcomes. Descriptive statistical analysis, as well as diagnostic accuracy and odds ratio calculation, using SPSS and MS Excel software, was performed.

Results. The study covered 40 medical cases. Age of the patients ranged from 18 to 95 years, while the mean age equaled 67 years (median: 71, IQR: 57–80, CI: 61.1–72.8). The overall in-ICU mortality was 65% (n = 26). In comparison to qSOFA-negative patients, qSOFA–positive patients had increased odds ratio for in–ICU mortality (OR 1.6, 95%:0.4, 5.8, p = 0.478), which was 22% higher than odds ratio for SIRS–positive (OR 1.3, 95%: 0.4, 3.9, p = 0.630). These results showed that qSOFA and SIRS positive patients had much higher mortality rate than qSOFA and SIRS negative. The highest mortality was observed for SIRS–positive patients with pneumonia (37%, CI: 1.5–2.5), while qSOFA–positive – with urosepsis (47%, CI: 1.9–2.5). The sensitivity of qSOFA in predicting in–ICU mortality was 0.846 (CI: 0.71–0.99), while 0.731 (CI: 0.56–0.90) for SIRS. The specificity amounted to 0.357 (CI: 0.11–0.61) for qSOFA, but for SIRS criteria equaled to 0.429 (CI: 0.17–0.69). The area under the receiver operating curve (AUC) of qSOFA equaled 0.602 (95% CI: 0.41–0.90) predicting a better in-ICU mortality then SIRS – 0.496 (95% CI: 0.29, 0.70).

Conclusion. Performed analysis showed, that for ICU admitted ICD-10 patients diagnosed with sepsis, the prevalence of SIRS and qSOFA statuses are moderate (68% (CI: 2.3–2.9) and 78% (CI: 2.0–2.3) respectively), indicating qSOFA criteria and status as more sensitive with greater prognostic accuracy than SIRS, but not absolute enough for the diagnosis.
THE DIFFERENCE IN LABORATORY CHANGES DUE 
TO ACCIDENTAL HYPOTHERMIA IN DIFFERENT AGE 
GROUPS, AND THEIR PROGNOSTIC SIGNIFICANCE

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Keywords. Accidental Hypothermia, laboratory tests.

Introduction. Studies show that the in-hospital mortality of patients with accidental hypothermia is up to 40 percent. The elderly subpopulation is proven to be affected more often and more severely than the rest of the adult population. In this research paper patient files were analysed to see if certain laboratory tests, and age have a prognostic significance in patients affected by accidental hypothermia in Latvia.

Aim. The aim of the research paper is to compare laboratory result changes in patients in different age groups and see if any of these differences can be predictive of the outcome.

Materials and methods. A retrospective cohort study based on 134 patient files with the ICD-10 hypothermia code (T68), chosen randomly from the archives of Gailezers hospital (Riga East Clinical University Hospital) from year 2014 throughout 2016. All the data was collected in Office-Excel file, and the relevant data was statistically analysed in SPSS (IBM SPSS statistics version 21).

Results. The outcome is statistically significant different (Pearson Chi-Square p-value < 0.001) in the two age groups; below and equal to 60 years and above 60 years of age. In the age group “Below 60”, out of a total of 71 patients, 62 patients (77.5 %) survived, and 9 patients (16.7 %) died due to accidental hypothermia. In the age group “Above 60”, out of 63 patients, only 18 patients (22.5 %) survived, and 45 patients (83.3 %) died. The odds ratio between the two age groups was 17.22 (95 % CI 7.090–41.832), and patients above 60 years old were shown to have a 71.4 % chance of dying when admitted to the hospital with hypothermia, while the patients below 60 years old only had a 12.7 % chance of dying due to accidental hypothermia. No laboratory test was proven to be predictive of outcome in either of the two age groups. A binomial logistic regression of APACHE II score sum showed that the chance of dying increased with 1.215 % with each point increase of the sum.

Conclusion. This study did not find any laboratory test where the result might be predictive of the outcome, but clearly demonstrate laboratory results outside reference range in both age groups and outcome groups. Higher age is shown to be associated with a high risk of a fatal outcome, and the APACHE II Scoring System sum is prognostic in calculating the approximate mortality rate, as chance of death increase with 1.215 % for each point in the sum.
DIFFERENCES IN PHYSIOLOGICAL CHANGES DURING IN LOWER INTRA- AND EXTRA-PERITONEAL LAPAROSCOPIC SURGERIES

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Keywords. Anesthesiology, laparoscopy, ventilation.

Introduction. Laparoscopic surgeries are becoming an increasingly important surgical method. Techniques and methods are improving constantly and surgeons as well as anesthesiologists are specially trained to perform laparoscopic surgeries. For the anesthesiologist, the critical point in this kind of surgery is the installation of gas into the abdominal cavity. The anesthesiologist is faced with the challenge of a changing human physiology caused by an increasing intra-abdominal pressure.

Aim. The aim was to investigate the changes of the lung physiology during intra- and extra-peritoneal laparoscopic surgery. Following research question was asked: What are the differences in airway pressure and CO₂ exhalation during intra- and extra-peritoneal laparoscopic surgery and what are the consequences for the anesthesiological management?

Materials and methods. A prospective study was conducted which emphasized on patients undergoing laparoscopic surgery. Intra-operative ventilatory and circulatory parameters were collected with a main focus on airway pressure (Pinsp) and exhaled CO₂ (EtCO₂). The participants (n = 56) were chosen randomly by anesthesiologists in Riga (Latvia) and Oelde (Germany). The data was analyzed by comparing the means in airway pressure and expiratory CO₂ between the two conditions of interest (intra- and extra-peritoneal surgery).

Results. The results show that the mean airway pressure increases significantly after positioning the patient in a head down position (trendelenburg position) as compared to the airway pressure after intubation for both intra- and extra-peritoneal surgeries. Secondly, we hypothesized that the mean EtCO₂ values return nearly to its baseline 5 minutes after gas deflation. It was observed that EtCO₂ values return later to its baseline when the gas was installed at an extra-peritoneal side as compared to gas which was insufflated directly into the abdominal cavity. Unlike expectations, it was even observed that in extra-peritoneal surgeries expiratory CO₂ values increased even more five minutes after gas deflation. These results did not hold true for intra-peritoneal laparoscopic surgeries.

Conclusion. We can conclude that the type of laparoscopic surgery significantly influences the lung physiology of the patient in terms of airway pressure and expiratory CO₂. Both approaches require different ventilatory regimes. For extra-peritoneal surgery, it is recommended to use a volume controlled ventilation whereas for intra-peritoneal a pressure controlled ventilation is preferable. Further research should be put into the actual effects of these ventilation regimes on the values of interest.
THE INFLUENCE OF PREOPERATIVE ANXIETY ON THE DEMAND OF ADDITIONAL PROPOFOL DURING INDUCTION OF ANAESTHESIA

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Keywords. High anxiety, propofol, anesthesia induction.

Introduction. High levels of preoperative anxiety have a direct influence on the amount of medication used during anesthesia. It is beneficial for the patients to identify methods of lowering preoperative anxiety, thus lowering the amount of medications needed.

Aim. The objective of the current study was to evaluate the possible link between high preoperative anxiety in patients and the demand for additional propofol during induction of anesthesia.

Material and methods. This prospective study was carried out in Republican Vilnius university hospital, in the period of 2016–2017. Altogether 47 patients (ASA I–II) were enrolled, that were expecting planned otorhinolaryngological surgery with general anesthesia. A day before surgery patients filled out the Hospital Anxiety and Depression Scale (HADS) to objectively evaluate levels of anxiety. During induction all patients received a primary bolus of 2.5 mg/kg propofol. A secondary (additional) bolus of 50 mg propofol was administered if, one minute after primary bolus, the patient’s heart rate was > 90 bpm. We compared patient groups with HADS > 7 (high anxiety) and HADS < 8 (low anxiety) and the need for additional propofol between these groups.

Results. A total of 47 patients were evaluated during this study: 10 females (21.27 %) and 37 males (78.73 %), with ASA I-II. 13 patients scored HADS > 7 (high anxiety) and 34 patients scored HADS < 8 (low anxiety). Additional propofol bolus was administered to 25 patients total, 10 (76.92 %) in high anxiety group and 15 (44.12 %) in low anxiety group. Patients with high levels of anxiety were 32.8 % (p = 0.044) more likely to receive additional propofol bolus during induction of anesthesia.

Conclusion. We demonstrated that there is a clear link between high levels of patient anxiety and the demand for additional medications during induction of anesthesia.
ANTHROPOMETRIC FOOT PARAMETERS OF MEN, WHICH REPRESENT DIFFERENT KINDS OF SPORT

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Keywords. Sports, foot, anthropometry.

Introduction. Human foot has unique structure. During a lifetime, foot structure can change depending on a lifestyle. One of the factors, that affects foot anthropometric parameters, is sport. In this scientific research feet of basketball players, football players and swimmers are analysed.

Aim. To get anthropometric parameters of sportmen’s foot and find out coherence to kind of sport.

Materials and methods. In this research, plantograph and photo camera from Institute of Anatomy and Anthropology (AAI) were used. Planograms and Achilles tendons’ photos were taken at RSU Sports Club – basketball, football and swimming teams were involved. Firstly, the analysis of plantograms was performed using method, described in book “Sporta medicīna”. Secondly, toe form analysis was performed using Galmiche P. method, described in “La presse Medicale” (1967). Thirdly, visual assessment of Achilles tendon’s position was performed.

Results. More than a half of sportsmen have normal longitudinal arches on both feet. 38% of basketball players, 40% of football players and 31% of swimmers have deformities of longitudinal arches. Normal transversal arch was found among 44% of basketball players, 5% of football players and 44% of swimmers. Deformities of transversal arch (mostly varus type) are more common: 56% of basketball players, 95% of football players and 56% of swimmers. Egyptian shape of toes can be seen more often among basketball players ~ 94%, but football players and swimmers also have Greek toe shapes ~ 35% and 31% respectively. No Roman shape of toes was found. A lot of sportsmen have light deformities of Achilles tendon. About half of basketball players have normal tendon position, 31% of them have X-shape deformity and 19% have O-shape deformity. 65% of football players have normal tendon position, others have X-shape deformity. Among swimmers 75% of sportsmen have normal tendon position and others have X-shape deformity.

Conclusion. Arch deformities are more common among football and basketball players and less common among swimmers. Deformities of transversal arch are very common among football players. More than a half of sportsmen have normal Achilles tendon position. Considering toe shapes, it can be seen that Egyptian and Greek shapes are most common, but basketball players have Egyptian toe shape more often. No Roman toe shape was found. The possible reason of these results is that football and basketball involves running on a field, but swimmers’ feet do not touch the ground and are exposed to load in a lesser degree. Moreover, football players hit ball with their feet and that is why they have deformities more often. Basketball players’ feet are adapted to high jumping and that is the reason why their first toe is longer (Egyptian shape).
INCIDENCE OF ANKLE INJURIES ACCORDING TO LAUGE-HANSEN CLASSIFICATION

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Keywords. Ankle, Lauge-Hansen classification, injury.

Introduction. One of the topical issues is the diagnostics of ankle injuries, as they may occur throughout a year. It is expected that ankle injuries in winter are caused by higher energy than in summer.

Aim. The aim of the study is to evaluate the incidence of ankle injuries according to Lauge-Hansen classification, focused on the trauma mechanism between ankle injuries in summer and winter period.

Materials and methods. A retrospective study of patients with ankle injuries was conducted. The patients were arranged in two groups: Group 1 comprised the patients admitted in the Hospital of Traumatology and Orthopaedics from December 2015 to February 2016 and Group 2 from June to August 2016. Inclusion criteria in Group 1 were information in the patients’ case record about injury related to ice. The patients who suffered high energy trauma were excluded from the study. The type of ankle injuries was evaluated according to the Lauge-Hansen classification using patient’s preoperative and postoperative ankle radiographs in the clinical database.

Results. The inclusion criteria in the Group 1 was met by 30 patients (8 male, 22 female, mean age 47.8 years) and in the Group 2 by 35 patients (15 male, 20 female, mean age 47.1 years) met the inclusion criteria. According to the Lauge-Hansen classification supination-external rotation injuries in the Group 1 were 86.7% (n = 26) vs. Group 2 60% (n = 21); pronation-external rotation injuries in the Group 1 were 10% (n = 3) vs. Group 2 22.9% (n = 8); supination-adduction injuries in the Group 1 were 3.3% (n = 1) vs. Group 2 5.7% (n = 2); pronation-abduction injuries in the Group 2 were 11.4% (n = 4), whereas Group 1 was without any incidence of these injuries.

Conclusion. This study highlights the incidence of injury types, caused by different trauma mechanism and energy in winter and summer. The most frequent, according to Lauge-Hansen classification, are supination-external rotation injuries in both groups in winter and summer. However, their occurrence is more frequent among the patients in group 1. In addition, the results reveal that there is variation as to the number of injuries across all four injury types in both groups. This data can be used for the hospital resources planning. We recommend careful evaluation of the ankle injuries using Lauge-Hansen classification since the injury type is essential in the diagnostics and preparation to the appropriate surgical treatment. Further studies need to be conducted.
SAGITTAL IMBALANCE: PREVALENCE AND RADIOLOGICAL APPEARANCE

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Keywords. Sagittal imbalance, spinopelvic parameters, Roussouly spinal types.

Introduction. Spinal imbalance is one of the main factors for back pain. Therefore it is crucial to investigate its development and risk factors, in example – how certain spinal types, which are congenital, predispose spinal imbalance. In example, first Roussouly type spine should be associated with bigger probability of spinal imbalance.

Aim. To investigate how does an alteration of spinopelvic parameters cause spinal imbalance and to evaluate prevalence of spinal imbalance among Roussouly spinal types.

Materials and methods. Digital pelvic and sagittal spine radiograms of 65 patients treated in Republican Vilnius University Hospital in 2014–2016 years were included to a retrospective study. Spinopelvic parameters: PT (pelvic tilt), PI (pelvic incidence) and SS (sacral slope); SVA (sagittal vertical axis); Cobb angle of lumbar lordosis were measured by computer. Using SVA values the results were split to two groups – balance (SVA < 5 cm) and imbalance (SVA ≥ 5 cm). Using spinopelvic parameters and appearance of global spine alignment the results were assigned to 4 Roussouly spinal types. Also, angle of L4 upper endplate was measured. The results were calculated using Pearson correlation, independent samples T-criterion and ANOVA test in IBM SPSS Statistics 24 program.

Results. Digital pelvic and sagittal spine radiograms of 65 patients (51 women, 14 men, age 33–97 years, Med = 58) were measured. Distributions in Roussouly spinal types: I: 21 (32.3%), II: 11 (16.9%), III: 17 (26.2%), IV: 16 (24.6%). Significant difference of spinal imbalance among these types was not found (p = 0.824). Type 1 had positive mean of L4 upper endplate angles (M = 6.52°), and it significantly differed from means of other spinal types, which were negative (II: M = −7.14°, III: M = −7.25°, IV: M = −13.09°) (p < 0.05). Significant difference of LL (p = 0.011) and PT (p = 0.006) found among balance and imbalance groups. Significant correlations were found between: LL and SVA (r = −0.273; p = 0.028), PT and SVA (r = 0.334; p = 0.007), LL and SS (r = 0.702; p < 0.05), LL and L4 upper endplate angle (r = −0.482; p < 0.05).

Conclusion. Different Roussouly spinal types has the same tendency for spinal imbalance. Increasing SVA causes higher PT. Decreasing LL cause decline of SS, increase of L4 upper endplate and therefore increase spinal imbalance.
OSTEOMYELITIS – STATISTICAL ANALYSIS OF CASES IN CLINICAL CENTRE BIKERNIEKI IN YEAR 2016

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Keywords. Osteomyelitis, inflammation, bone, statistical, analysis.

Introduction. Osteomyelitis or inflammation of the bone narrow is a disease known for centuries and is still an important health issue. The incidence in adults varies according to type of osteomyelitis and in different populations. It is more common in males, most frequent localizations are lower extremities and spine. Some of the predisposing factors are diabetes mellitus, vascular diseases, traumatic injuries and surgery. Most common isolated microorganism is Staphylococcus aureus (S. aureus).

Aim. The study aimed to collect and analyze cases of osteomyelitis in Clinical Centre Bikernieki in year 2016.

Materials and methods. Retrospective clinical history analysis was used for evaluation. 94 cases were collected. Descriptive statistics and nonparametric test Independent sample Mann-Whitney U test were used to analyse data and for comparison of specific groups.

Results. Mean age was 60.73 (SD 16.88), with minimum age 13 and maximum 93. The distribution of age was not the same across the category of sex according to Mann-Whitney U test (p < 0.001). Median age for men was 50.00 (IQR 45.00–65.25). Median age for women was 71.50 (IQR 60.50–80.00). Out of 94 patients 54 (57.4 %) were men and 40 (42.6 %) were women. Surgical treatment was performed in 78.7 % (74) of cases, but conservative treatment in 21.3 % (20). Out of 42 cases of peripheral osteomyelitis, 26 (61.9 %) amputations were performed. Mean days spent in hospital was 27.59 (SD 20.06) with maximum 114 and minimum 4 days. Most common isolated m/o was S. aureus (n = 23, 62.2 %). Resistant m/o were isolated in 31.2 % of cases, penicillin resistant being the most common (n = 16). The most common localization of osteomyelitis was vertebrae 47 cases (50 %), followed by toes with 21 cases (21.4 %). Tarsal bone osteomyelitis was more common in men according to Fisher’s Exact test (p = 0.019, men 13 %, women 0 %). Most common comorbidities were primary arterial hypertension (41.2 %, n = 28), coronary artery disease (41.2 %, n = 28), congestive heart failure (36.8 %, n = 25), diabetes mellitus (27.9 %, n = 19) and total atherosclerosis (16.2 %, n = 11).

Conclusion. Osteomyelitis trends such as most common comorbidities and localizations, more frequently isolated microorganism, male patient prevalence, mean age in Biķernieki Clinical Centre are overall similar to literature data. It was also discovered that median age for women suffering from osteomyelitis was higher than men. Tarsal bone osteomyelitis was more common in men. Osteomyelitis of other localization had no statistically significant difference amongst sexes.
FUNCTIONAL RESULTS AFTER THUMB RECONSTRUCTION IN PATIENTS WITH THUMB HYPOPLASIA

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Keywords. Thumb hypoplasia, congenital hand disorders, thumb reconstruction.

Introduction. Thumb hypoplasia is a congenital hand disorder. It is characterised as underdevelopment of thumb’s structures. Three surgical techniques are used – tendon transposition, pollicization, toe-to-hand transplantation.

Aim. Evaluate functionality of a reconstructed thumb in patients with thumb hypoplasia. Materials and methods. A retrospective cohort study was conducted. The study population included all patients, who underwent thumb reconstruction from 2008 until 2016. All surgeries were done in The Microsurgery Centre. Follow-up examination was performed at least 6 months after the surgery. Patient’s completed Disabilities of the Arm, Shoulder and Hand (DASH) survey. Range of motions (ROM) was measured in three thumb’s joints – carpometacarpal, metacarpophalangeal and interphalangeal. Strength of power and pinch grip, two-point discrimination was tested. Results were analyzed in IBM SPSS v23.0.

Results. In period from 2008 until 2016 39 patients have undergone thumb reconstruction surgery due to thumb hypoplasia. 19 cases were analysed – 14 cases of tendon transposition, 2 toe-to-hand transplantations and 3 pollicizations. 11 patients had Blauth II stage, 1 patient IIIa stage, 4 IIIb cases, 1 case with IV stage and 2 cases with V stage thumb hypoplasia. No cases of early surgical complications occurred. In tendon transposition group decreased ROM was detected in 50% of measurements, in transplantation group – in 33% of measurements and in pollicization group – 43%. Power grip affected vs. healthy hand average score – tendon transposition group 8.45 vs. 11.09 kg, transplantation group 16 vs. 18.5 kg, pollicization group 5 vs. 5.67 kg. Pinch grip affected vs. healthy hand average score – tendon transposition group 2.84 vs. 3.3 kg, transplantation group 0.75 vs. 4 kg, pollicization group 1.17 vs. 2.17 kg. Two-point discrimination test was abnormal in 1 case. DASH score in tendon transposition group – range 0.9–56.3, mean 14.5, transplantation group – range 8–10.7, mean score 9.35, pollicization group – range 6–26.7, mean score 19.8. All measurements between transplantation and pollicization groups were compared using Mann-Whitney test. In all cases, p value was greater than 0.05.

Conclusion. Tendon transposition is an effective method for Blauth stage II and IIIa. For more severe stages thumb replacement is required. Pollicization is commonly used method, but leaves patient’s hand with 4 digits. Toe-to-hand transplantation is newer and more complicated surgical procedure, but has advantage of five-digit hand. Early results indicate that toe-to-hand transplantation provides as good functional results as pollicization.
HEMI-HAMATUM ARTHROPLASTY OUTCOMES

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Keywords. Hand surgery, arthroplasty.

Introduction. Multifragmental intraarticular middle phalanx base fractures mostly occur in young adults during sports or work-related activities. If left untreated properly proximal interphalangeal (PIP) joint instability and pain persists, thus impairing hand’s function and quality of life. Joint surface reconstruction with hamate osteochondral graft can be used for multifragmental middle phalanx base reconstruction.

Materials and methods. A retrospective study was conducted. 16 patients were treated with this technique. Follow-up was performed at least 6 months after the surgery. Patients were asked to fulfil multiple surveys – Disabilities of the Arm, Shoulder and Hand (DASH), Patient-Rated Wrist Evaluation (PRWE) and Modern Activity Subjective Survey 2007 (MASS07). Objective measurements included – strength of the power and pinch grip, range of motions (ROM) in both proximal interphalangeal (PIP) and distal interphalangeal (DIP) joints. All measurements were taken on both hands, on operated and contralateral fingers.

Results. Out of 16 patients 6 were females and 10 males, mean age 40 (ranged 22–65). 9 patients agreed to come for follow-up. All patients are right-handed, 8 out of 9 patients injured right hand. Injuries were obtained in the results of sports (3 cases), fighting (2 cases), work-related (4 cases). 6 patients were treated with immobilisation before the surgery, which was performed in average 45 days after injury (ranged 1–184 days). 2 patients developed arthrosis post-operatively and received synthetic joints. These patients were excluded from further investigations. Mean DASH score was 8.9, PRWE score was 6.6 and mean MASS07 score – 8.7. Patients achieved in average 90% of power grip and 100% of pinch grip with injured hand compared with healthy hand. Active flexion reached 90–100 degrees in PIP joint and from 30 to 90 degrees in DIP joint. 5 patients experienced from 10 to 30 degrees of fixed flexion. Mean active ROM was 80 degrees in PIP and 63 degrees in DIP joint. No patients experienced joint instability or chronic pain.

Conclusion. Hemi-hamatum arthroplasty provides satisfactory results in patients with both acute and chronic dislocated intraarticular middle phalanx base fractures. Main potential drawbacks are slight chances of arthrosis post-operatively, reduced ROM in PIP and DIP joints. Nevertheless, the vast majority of patients are pain free and are able to continue work duties and sports activities.
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PREGNANCY AFTER LIVER TRANSPLANTATION

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Keywords. Pregnancy, transplantation, liver, transplant rejection, hepatitis C virus, immunosuppression.

Introduction. Pregnancy with good outcome is extremely rare after the organ transplantation. Extranatal pathology and the need of treatment with immunosuppressive drugs may complicate pregnancy and its outcome for both mother and child. In Lithuanian history it is the first case when a mother delivered a live baby after receiving a liver transplant.

Case report description. In 2015 pregnant woman (gravida 4, para 3) was referred to the Department of Obstetrics and Gynecology at Vilnius University Hospital Santaros Clinics at 33 weeks of gestation due to developing transplant rejection after the liver transplantation. She had history of one blighted ovum and two Cesarean sections. The first child died because of multiple development disorders.

In 2004 she was diagnosed with hepatitis C virus. Hepatitis progressed to liver cirrhosis and portal hypertension which led to bleeding from the upper digestive tract and splenectomy. In 2013 orthotopic liver transplantation m. Belghiti was performed. The immunosuppressive therapy was prescribed. However, HCV reactivation occurred. Following the treatment HCV RNR disappeared with stable virologic response.

After the transplantation patient was diagnosed with type II diabetes and primary arterial hypertension.

The patient became pregnant in 2015. Preceding the pregnancy, the immunosuppressive drugs were lowered. On the third trimester of pregnancy the gastroenterologist recommended to terminate the pregnancy.

Following the arrival, the mother was prescribed with dexamethasone due to fetal lung immaturity. A male baby weighing 2420 grams, 45 cm height, Apgar 8/9 was delivered at 33 weeks of gestation by cesarean section.

After surgery the mother was treated in Intensive care unit for 4 days. Three weeks after surgery she was diagnosed with sepsis caused by E. coli. The total time she had spent in hospital was 35 days.

The last known visit of this patient was on 2017-12-20. Her condition was stable, viral agents were not found. The liver function was satisfactory.

Conclusion. Low incidence of pregnancy after transplantation leads to individualized approach to the patient. It is essential to bring together a multidisciplinary team to choose the best way to save both the mother and the child. Furthermore, in order to achieve better understanding of these conditions the case reports are necessary.

Summary. This case report presents a pregnancy after liver transplantation. The pregnancy was complicated by transplant rejection. At 33 weeks of gestation the patient delivered a live baby by cesarean section. After pregnancy her condition has stabilized.
SPONTANEOUS PREGNANCIES IN A WOMAN WITH TURNER SYNDROME MOSAICISM

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Keywords. Turner syndrome, mosaic, pregnancy, spontaneous.

Introduction. Turner syndrome (TS) is a congenital disorder caused by loss of one of the X chromosomes. It affects about 1 in 2500 live born girls. Due to early ovarian failure most women with TS are infertile, 5–10 % undergo spontaneous puberty and only 2 % can conceive spontaneously. There is a high risk for maternal complications and negative pregnancy outcome. The rarity and the number of different risks in these pregnancies makes it a multi-disciplinary challenge.

Case report. A 27 year old white female with a history of mosaic TS (46, XX / 45, XO) presented for antenatal care at 11th week of gestation in her first pregnancy. The diagnosis of TS was established at age of one by karyotyping, where 75 % of cells showed 45,XO. Menarche started spontaneously at age 11, with irregular menstrual bleeding. During childhood the patient undergone 6 bowel surgeries due to anal atresia and received multiple blood transfusions due to anemia. The patient had no relevant family history to this case. On initial physical examination the patient had normal secondary sexual characteristics, her height was 150 cm (5th percentile) and weight – 42 kg (5th percentile). Gynecological ultrasound displayed early intrauterine pregnancy and two uteri. The patient was counselled about the potential complications and decided to proceed with the pregnancy. The patient was frequently assessed by a team of specialists. Echocardiography found. Diagnostic amniocentesis was done 14th and at 15th week of pregnancy suggested and no abnormalities normal karyotype were of the fetus (46,XY). An oral glucose tolerance test was performed at 25 weeks, it revealed gestational diabetes, that was managed by diet and regular blood glucose level self-control. Spontaneous labor occurred at 36 weeks and due to pelvic fetal presentation a Caesarean section was performed. The patient gave birth to a baby boy without any external malformations. Apgar score was 8 and 9 at 1 and 5 minutes, respectively. Both were discharged 6 days later. 3 years later the patient had another pregnancy which resolved with a miscarriage at 6 weeks of gestation.

Conclusion. It is highly unusual for a woman with TS to spontaneously conceive, and monitoring these high-risk pregnancies is a multi-disciplinary challenge, but positive outcomes are still possible.

Summary. We report a rare case of TS mosaic woman who had two spontaneous pregnancies to bring attention to the risks and challenges these pregnancies may cause to gynecologists.
A CASE OF TWIN–TO–TWIN TRANSFUSION SYNDROME

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Keywords. Twin-to-twin transfusion syndrome, polycythemia, anemia.

Introduction. Twin-to-twin transfusion syndrome (TTTS) is a rare condition which affects only monozygotic twins and is characterized by transfusion of blood from one (donor) twin to another (recipient) through placental vascular anastomoses. The donor becomes hypovolemic and anaemic in contrast to recipient, who develops polycythemia and hypervolemia. Partial exchange transfusion (PET) is traditionally used for lowering the hematocrit in case of polycythemia.

Case report description. 26-year-old woman, gravida 1, para 1 with monochorionic diamniotic twin pregnancy was admitted to the hospital in 38th week of gestation due to abnormal cardiotocography (CTG) findings; subsequent Caesarian section was performed due to fetal distress (FD). Oligohydramnion of first and growth retardation of second twin was diagnosed antenatally. Diagnosis of TTTS was established shortly after delivery. First newborn was a female TTTS recipient showing plethoric skin discoloration with acrocianosis and jaundice on physical examination. Laboratory studies demonstrated severe polycythemia (hemoglobin 26.3 g/dL, hematocrit 78.9 %), leukocytosis and hyperbilirubinemia. PET was performed to reduce hematocrit levels. Second newborn was a small for gestational age female TTTS donor, who presented with respiratory distress (RDS) and skin pallor. Due to secondary anemia (hemoglobin 7.1 g/dL; hematocrit 23.1 %) red blood cell transfusions were required. Both neonates were treated in neonatal ICU and received ventilation assistance for RDS as well as antibacterial treatment due to leukocytosis and suspected intrauterine infection. Twins were transferred to Children’s Clinical University Hospital for further evaluation.

Conclusion. TTTS is a rare disorder associated with high risk of fetal and neonatal mortality; survived neonates are at risk of severe cardiac, neurologic, and developmental disorders. Treatment options to prevent complications in case of antenatally identified TTTS are reduction amniocentesis in recipient twin and fetoscopic laser coagulation of chorionic plate anastomoses; none of them was applied in this case because of late diagnosis. CTG is simple and widely available method for evaluation of fetal well-being in case of suspected TTTS.

Summary. Mother of term pregnancy with TTTS was admitted to the hospital due to abnormal CTG findings and Caesarian section was performed because of FD. First neonate was a recipient born with severe polycythemia, therefore received PET to reduce hematocrit levels. Second neonate was a TTTS donor with skin pallor and anemia treated with RBC transfusions. Both neonates received successful treatment in ICU and transferred for further evaluation.
NEWBORN WITH PRIMARY HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS: A CASE REPORT

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**Keywords.** Hemophagocytic lymphohistiocytosis, autosomal recessive inheritance, neonate.

**Introduction.** Primary hemophagocytic lymphohistiocytosis (HLH) is a rare and potentially fatal disorder of immune regulation characterized by abnormal activation of histiocytes and lymphocytes. PRF1 mutation type of HLH is inherited in an autosomal recessive manner and manifests in infants from birth to 18 months of age. The incidence is estimated at 1 case per every 50,000 live births.

**Case report description.** A patient is a male term neonate with amniocentesis-proven PRF1 gene mutation, which is responsible for development of primary hemophagocytic lymphohistiocytosis. His mother is a 39-year-old woman, gravida 3, para 3 and both of her previous newborns died shortly after delivery; PRF1 mutation was identified post-mortem.

Newborn was transported to neonatal ICU due to severe pulmonary, gastrointestinal and injection-site bleeding, impaired respiratory function, low muscle tone and reflexes, diffuse petechial hemorrhages and edema. Prominent hepatosplenomegaly and lymphadenopathy was observed on physical examination. Laboratory studies revealed progressing leukocytosis, anemia, thrombocytopenia, impaired coagulation (DIC syndrome), elevated ALT and AST (12260 U/l) and metabolic acidosis. He received a treatment with multiple blood product transfusions, antibiotics, vasopressors, analgesics and dexametasone. After multidisciplinary consult chemotherapy according to the HLH-2004 protocol was indicated but postponed due to severe condition. Bone marrow transplant was also planned as a treatment method. 34 hours after birth the patient died due to multiorgan failure and uncontrollable bleeding.

**Conclusion.** Although the particular genetic pathology can be identified antenatally the course of disease in some individuals may be too aggressive, thus making the treatment inapplicable. Despite autosomal recessive inheritance manner in this case all of the newborns were proven to have inherited PRF1 gene mutation with subsequent manifestation of HLH, suggesting that IVF with preimplantation genetic testing could be used in following pregnancies to avoid such condition.

**Summary.** Parents-carriers of PRF1 gene mutation have had 3 newborns died with proven primary HLH. Parents decided to continue third pregnancy, despite the diagnosis of HLH was established antenatally. Neonate was born with severe coagulopathy, metabolic acidosis and multiorgan disfunction and did not survive to receive bone marrow transplant and chemotherapy.
INFANTILE SYSTEMIC HYALINOSIS

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Introduction. Infantile systemic hyalinosis is a rare genetic disorder which is caused by hyaline accumulation in body tissues. It affects many areas in the body such as joints, skin, bones and internal organs where lumps of hyaline are formed. The disease starts to affect children from their first months of life, it causes many complications and there is no cure for this disease at the time.

Case presentation. In this case report we present a 2 year old girl with infantile systemic hyalinosis. The symptoms started to occur in the first months of child's life. First symptoms were slow growth, limited movements, at 3 months – soft, mobile skin bumps, skin thickening at 7 months – gingival hypertrophy. Because of multiple joint contractions the girl was at first diagnosed with arthrogryposis. Later in life severity of the symptoms increased, the patient had severe diarrhea, was failing to gain weight, had common respiratory infections, insomnia. When the girl was 16 months old she could not sit, walk or talk. At the age of 2 years the patient was consulted by a geneticist who suspected the disease and ordered skin biopsy. The biopsy of a lump from her forearm showed changes similar to infantile systemic hyalinosis. To completely confirm the diagnosis genetic testing was made which showed mutations in the ANTXR2 gene so there was no doubt that the patient has this particular illness. Since the diagnosis the girl was treated in Children's Hospital in Vilnius. The treatment is only symptomatic – the patient receives special diet, goes to the physiotherapy, occasionally has some hyaline lumps removed surgically and is treated for the respiratory infections when needed.

Conclusion. Infantile systemic hyalinosis is a very rare genetic disorder so the knowledge of this disease is very limited. The prognosis of this disease is poor because there is no known etiopathogenetic treatment at this time.

Summary. Infantile systemic hyalinosis is a very rare genetic disorder caused by a mutation of ANTXR2 gene. In this case we present a 2 year old girl who suffers from the disease and experiences symptoms caused by a pathological accumulations of hyaline in tissues. The prognosis for those who have this illness is poor because the treatment is only symptomatic and there is no drugs to stop the disease from evolving.
PEDIATRIC DIABETIC KETOACIDOSIS WITH ACUTE PANCREATITIS

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Keywords. Diabetic ketoacidosis, acute pancreatitis, type 1 diabetes.

Introduction. Diabetic ketoacidosis is a metabolic emergency in patients with diabetes characterized by hyperglycemia and acidosis, while acute pancreatitis is a medical emergency with diagnosis based on clinical findings, biochemical markers and abdominal imaging studies. There is a space for more data and discussion on diabetic ketoacidosis with acute pancreatitis in type 1 diabetes, especially in a pediatric setting, as the period of young adulthood is critical for establishing good diabetes management skills as evidenced in this case study with late teens as a time of changing lifestyle.

Case report description. A 17-year-old comatose patient was admitted to the pediatric hospital in October 2017 with suspected diabetic ketoacidosis. Laboratory findings showed serum glucose levels of 70.88 mmol/L, arterial pH 6.741, reduced serum bicarbonate levels, an anion gap that of 33.3 mmol/L as well as positive urine ketones, thus confirming the diagnosis of severe diabetic ketoacidosis. Apart from these findings patient’s serum amylase and lipase levels were 638.80 U/L and 2664.48 U/L with elevated inflammatory markers and with signs of acute pancreatitis in abdominal ultrasound. While patient showed signs of recovery through insulin, fluid and antibacterial therapy as well as appropriate diet there were also other complications that needed further investigation and management – hypothermia, pneumonia, decubitus, multifactorial peripheral neuropathy and hypertension, thus prolonging patient’s time of convalescence. Patient’s medical history revealed that patient has had type 1 diabetes since 2010 and received regular diabetes care, though patient’s glycemic control and diabetes management skills were poor with HbA1C 12.01 % and admittedly irregular insulin use. Adding to these risk factors patient also admitted use of alcohol in days before the onset of first symptoms (polyuria, nausea, vomiting and weakness), which could be seen as a potential trigger mechanism and contributing factor.

Conclusion. This case study reports a presentation of complicated medical emergencies in late teens, while adding to the discussions about the relationship between concomitant diabetic ketoacidosis and acute pancreatitis as well as the challenges of type 1 diabetes management during young adulthood.

Summary. Diabetic ketoacidosis and acute pancreatitis are life-threatening medical emergencies with certain diagnostic criteria and need of a prompt treatment. While diabetic ketoacidosis is not a rare complication in type 1 diabetes patients, also acute pancreatitis shouldn’t be discarded in a pediatric ward, especially taking in account young adulthood and it’s challenges.
PEDIATRIC PATIENT WITH HEMANGIOMA AND DISSOCIATED VERTICAL DEVIATION WITH INTERMITTENT EXTOPIA. A CASE REPORT

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Keywords. Hemangioma, strabismus, DVD, intermittent extropia.

Introduction. We report one case of pediatric patient with eyelid and orbital hemangioma and dissociated vertical deviation (DVD) with intermittent extropia with special emphasis on the therapy. Hemangiomas are the most common benign tumour of infancy. Hemangiomas located on the lid or around the orbit are at risk of causing visual impairment. They require close observation and early therapy. Dissociated vertical deviation (DVD) is a poorly understood innervational disorder characterized by a spontaneous upward deviation of either eye (dissociation) while the other eye fixates a target. DVD is most commonly associated with infantile esotropia, but it is also associated with intermittent exotropia in a minority of cases.

Case report description. 2 months old female patient was referred to Children’s Clinical University Hospital due to obstructive upper and lower eyelid hemangioma in the right eye (OD). She was treated with prednisolone (10 mg/day for month) and laser therapy, which had a positive effect. After a year she received kenalog injections into hemangioma mass. After that patient started receive propranolol therapy (5 mg 3 times a day for month). At the age four, girl was diagnosed with dissociated vertical deviation with intermittent exotropia and underwent strabismus surgery (OD recessio m. rectus lateralis 5,5mm, recessio m. rectus superior 5,5mm). Visus OD 0,5, cc + 1,5 D cyl 0,63, OS 0,2, cc + 3,0 D sph + 1,5 D cyl ax 90° 0,5. Prism cover test (PCT) cc 20 ∆ BI + 16 ∆ BD at near OD. PCT nc 14 ∆ BI + 25 ∆ BD at distance OD. Ten months after surgery when the right eye fixates a left hypertropia and esotropia is present. Hypertropia and esotropia size varies in the evening and in the morning, after fatigue and without fatigue. When the left eye fixates, strabismus angle practically not observed. The following treatment – 6 to 8 hour long occlusion for the right eye to hold fixation in the left eye. At the age eight, strabismus is well compensated. PCT cc 16 ∆ BO + 8 ∆ BD at near OS. PCT cc 14 ∆ BO at distance. OS vertical strabismus still present. After year a second surgery was performed (OS recessio m. rectus medialis 5,5mm, m. obliquus inferior anterior transposition 2,5 + 2,5 mm from m. rectus inferior insertion point).

Conclusion. Eyelid and orbital hemangioma can lead to reduced visual acuity due to strabismus or occlusion by the eyelid itself. Strabismus can occur if the orbital hemangioma exerts mass effect on the globe causing displacement or involves the extraocular muscles. In this case hemangioma was not the reason of strabismus, because of the early treatment, but this is a good example of the need to start hemangioma treatment and differentiate the hemangioma-induced strabismus from other strabismus causes for example muscle dysfunction, that needs other type of therapy.

Summary. Hemangioma treatment included corticosteroids, beta-blockers and laser. In DVD inferior oblique anterior transposition frequently becomes the first-line approach when inferior oblique muscle hyperfunction is present. Strabismus is a challenge for all specialists in ophthalmology that requires surgical treatment for the improvement of clinical outcome.
OPITZ-FRIAS SYNDROME: A CASE REPORT

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Keywords. Multiple congenital anomalies, tracheal cleft, Opitz-Frias.

Introduction. The Opitz-Frias syndrome is a rare congenital midline malformation syndrome diagnosed on the basis of clinical findings. It is characterized by laryngotraceo-esophageal abnormalities, hypertelorism, hypospadias, imperforate anus and developmental delay. Molecular genetic testing is difficult due to the complicated etiology.

Case report description. A ten-day old male infant was referred to Children’s Clinical University hospital (CCUH) with right sided pneumonia and esophageal fistula suspecta. He was born at the 39th gestation week by a Caesarian section due to the uterine scar after first labor. Apgar score 8/9. Examination reveals severe respiratory insufficiency, no swallowing movements, salivation. Massive, thick mucus suctioned from upper respiratory tract. Ectopic anus, hypospadia, hypertelorism also remarked. At the age of twelve days transferred to the CCUH ICU with the diagnosis of traheoesophageal fistula, ectopic anus. Sigmostoma duplex was made. Videobronchoscopy and EGDS reveals congenital laryngeal anomaly, tracheal cleft, anomaly of bronchi and tracheal bronchomalacia. In a CT scan no posterior wall of trachea and anterior wall of esophagus are differentiated. Tracheal cleft type IVa confirmed. Due to the rare congenital pathology, consilium was called to decide further tactics. The operation planned in Finland, Helsinki (no previous operations of this kind has been done in Latvia). Karyotyping and FISH 4q was performed; a normal male karyotype (46, XY) was reported and Opitz-Frias syndrome was suspected. No chromosomal abnormalities reported. At 2-months of age a tracheal cleft closure in cardiopulmonary bypass and tracheostomy was performed in Helsinki. Discharged from the hospital 2 months after operation– prolonged stay due to the opiate abstinence, complex care, tracheobronchomalacia, oxygen dependency, feeding difficulties.

Conclusion. The phenotype of the infant matches criteria for Opitz-Frias syndrome. It is a rare pathology, which demands complex care because of the tracheostoma and sigmostoma, several operations and increased risk for hospital-acquired infections.

Summary. A ten-day old infant presented with right sided pneumonia, severe respiratory insufficiency, no swallowing movements and salivation. Tracheal cleft type IVa was discovered and treated surgically. Prolonged hospital stay was needed due to complex care.
THE FIRST CASE OF MEN2B SYNDROME IN PEDIATRIC PRACTICE IN LATVIA

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Keywords. Type 2B multiple endocrine neoplasia, medullary thyroid carcinoma, nodular goiter, pheochromocytoma.

Introduction. Type 2B multiple endocrine neoplasia (MEN2B) is a rare (1 in 600,000 to 1 in 4 million) familial cancer syndrome caused by mutations in the RET proto-oncogene. Almost all individuals with MEN2B have an identical mutation in codon 918 of exon 16. Inheritance is autosomal dominant, with variable penetrance (70%) and expressivity. Patients with MEN 2B present with pheochromocytoma, medullary thyroid carcinoma, mucosal neuromas and marfanoid habitus.

Case report. A 16-year-old boy presented with previously diagnosed nodular goitre caused by medullary thyroid carcinoma with metastasis for further examination. Medullary thyroid carcinoma was suspected when an ultrasonography scan revealed nodules in the thyroid and regional lymph nodes. Intraoperative biopsy material from thyroid gland, thymus and lymph nodes (paratracheal, next to v. jugularis interna, next to ductus thoracicus, a. carotis bifurcation and cervical jugular lymph nodes) was collected for further histological and cytological examination. The results confirmed homogene thyroid medullary carcinoma with metastasis in lymph nodes and thymus. Due to the diagnosis the patient had a total thyroidectomy and extirpation of the metastatic lymph nodes. Post-operative hypothyroidism and hypoparathyroidism was observed. Therapy included Levothyroxin, calcium and D3 vitamin. Objective examination: severe lip hyperthrophy, suspicions of multiple neuromas in the oral cavity, hypertelorism and mild intellectual disability was observed during physical examination. Biopsy material was collected from the oral cavity for histological examination. The results confirmed multiple mucosal neuromas inherent to MEN2B. MRI and PET/CT scan showed a tumour formation in the left adrenal gland. The phenotypical changes and investigation findings suggested for MEN2B. Blood tests were taken for molecular genetic investigation to exclude possible mutations in RET gene. The results revealed a mutation M918T – in the codon 918 of exon 16 where methionine was replaced by threonine. Previous findings together with the laboratory test results confirmed the diagnosis – very severe type MEN2B. Due to the mutations in the RET gene the genetical analysis was also performed to the patient’s brother. The results came back negative excluding the inheritance.

Conclusion. The case demonstrates diagnostic difficulties associated with very rare form of cancer. At the moment the only treatment option for this diagnosis is surgical. Unfortunately, specific radiotherapy or chemotherapy for MEN2B does not exist. Hence, it is in high importance to recognize thyroid gland nodules and perform the biopsy immediately, in order to exclude the presence of cancerous cells and avoid metastasis.

Summary. Type 2B multiple endocrine neoplasia is a very severe and rare diagnosis, especially in pediatrics. This is the first registered pediatric case in Latvia. Biopsies of thyroid gland, thymus, lymph nodes and oral cavity were made together with a genetic test in order to diagnose the patient.
MIDAORTIC SYNDROME: A CASE OF ASYMPTOMATIC PEDIATRIC STAGE II HYPERTENSION IN WILLIAMS SYNDROME

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Keywords. Midaortic syndrome, arterial hypertension, pediatrics, Williams syndrome.

Introduction. Midaortic syndrome (MAS) is a rare condition characterized by narrowing of the distal thoracic aorta, abdominal aorta and its major branches, often resulting in severe renovascular hypertension. It constitutes about 0.5–2.0% of all the cases of aortic coarctation and is usually seen in children and young adults.

Case report description. A 14-year-old girl with Williams syndrome was admitted to Children’s Clinical University Hospital with a 2-year history of asymptomatic arterial hypertension. On admission, her blood pressure was above 170/90 mmHg, the state of peripheral pulse was assessed as full and symmetrical. On physical examination, a grade 4/6 systolic murmur over the abdominal aorta was heard. Medical tests carried out previously showed no evidence of pathologies of the visceral organs, cerebrum and endocrine system. Blood and urine test results were inside the normal range.

Further investigation with multisection CT angiography and Doppler ultrasound revealed a severe hypoplasia of the thoracic and abdominal aorta and its branches between T8 and L1. The diagnosis of midaortic syndrome was made and the patient underwent percutaneous stent implantation into the thoracic and abdominal aorta. In total 4 stents, each 48 mm in length and 12 mm in diameter, were successfully implanted in the aorta extending from the distal third of the thoracic aorta (T8) to the level of the renal arteries (L1). In addition, both ostia of the renal arteries were dilated with a balloon catheter during percutaneous transluminal angioplasty (PTA). The postoperative period was uneventful and the patient was discharged from the hospital.

Although significant improvement has been achieved, the patient still has to control her blood pressure by taking antihypertensive drugs daily. Despite the procedures performed previously, her blood pressure remains above the 95th percentile.

Conclusion. This case report highlights that midaortic syndrome is an uncommon, possibly challenging condition to diagnose and potentially life-threatening cause of arterial hypertension in children and young adults. Therefore, measurement of blood pressure should be part of routine examination in all children at least once a year and high values must be investigated further.

Summary. A 14-year-old hypertensive girl with Williams syndrome was diagnosed with midaortic syndrome (MAS), a rare condition characterized by narrowing of the distal thoracic aorta, abdominal aorta and its major branches. Angioplasty and vascular stenting was performed. Even though a decrease in blood pressure has been achieved, it remains above the normal range.
OMEN SYNDROME AND CYTOMEGALOVIRUS IN DONOR’S MILK: A CASE REPORT

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Keywords. Omenn syndrome, donor’s milk, cytomegalovirus infection, sepsis.

Introduction. Omenn syndrome (OS) is an autosomal recessive form of severe combined immunodeficiency (SCID) characterized by erythroderma, desquamation, alopecia, chronic diarrhea, lymphadenopathy, and hepatosplenomegaly. This SCID has been linked to mutations in the RAG1/RAG2 gene. The Prevalence of OS is < 1/1,000,000. It’s one of the rarest infant’s syndromes which is fatal if hemopoietic stem cell transplantation (HSCT) is not performed. We present a case of OS which was diagnosed for patient who has been fed by unpasteurized donor’s milk (DM) for a few weeks, as a consequence cytomegalovirus (CMV) infection caused the death of the patient.

Case report. For a 3-week-old girl who had progressive skin rash since her birth, severe atopic dermatitis was diagnosed. Due to the deteriorating condition of the skin, breast-feeding was discontinued when girl was only 6-weeks-old and she was hospitalized at Children’s hospital of Vilnius University hospital Santaros Clinics for more detailed examination. At 10-weeks-old SCID with low T and B cell count and hypogammaglobulinemia was diagnosed. Based on clinical examination OS with the absence of B lymphocyte population was confirmed. Molecular genetics by NGS test revealed homozygous mutation of the RAG1 gene. The allogeneic HSCT is the only way to cure a SCID. After five days of conditioning, CMV infection (766,000 copies/ml) and respiratory failure was detected. An urgent allogeneic HSCT was performed when the girl was 15 weeks old. Despite intensive therapy, the patient died 4 days after transplantation due to multiple organ failure, sepsis, caused by CMV infection. When breast-feeding was discontinued mother started to feed girl with another woman’s unpasteurized milk. Only after few weeks, mother started feeding with investigated and pasteurized DM from “The Milk Bank”.

Conclusion. It is believed that the lethal outcome was confirmed by CMV infection. Considering that patient’s mother and stem-cell donor’s anti-CMV immunoglobulins (IgM/IgG) were negative, it is believed that the infection has been transmitted through the unpasteurized DM from another woman. Therefore, in this case, the discussion arises about the use of unpasteurized DM for the feeding of children with severe combined immunodeficiency diseases.

Summary. It is a lethal case of the Omenn syndrome. An urgent allogeneic HSCT was performed. Despite intensive therapy, the patient died due to the multiple organ failure, caused by CMV infection 4 days after transplantation. It is believed that the infection has been transmitted through the untreated DN from the another woman.
17P CHROMOSOME DUPLICATION

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Keywords. 17p chromosome duplication, multiple developmental defects, frequent infections.

Introduction. A 17p duplication means that the cells of the body have a small but variable amount of extra genetic material from one of their 46 chromosomes – chromosome 17. It may increase the risk of birth defects, developmental delay and intellectual disability.

Case report description. 3 years old boy is one of heterozygous twins and he has a 17p chromosome duplication. His mother is 38 years old healthy women and his father 37 with vision and hearing disorders and cleft palate in anamnesis. His brother has language and development impairment. It was the fourth pregnancy and the second labor. A lower weight, cleft palate and renal agenesis were noticed before the birth. He was born at 33 weeks with multiple developmental defects and psychomotor retardation. Birth weight 1800g. He had frequent upper and lower airways diseases and several bilateral serous otitis. This time the boy was hospitalized in ICU because of dyspnea, slight fever, sluggishness, cough and rhinitis. Vital signs: T 38.5 °C. Respiration rate: 45 bpm, heart rate: 145 bpm, SpO₂ 89 %, BP 101/83 mmHg, CRT 3s. Skin elasticity decreased, dry tongue with white coating. Cervical and submandibular lymph nodes are enlarged (3 cm). Pharyngeal erythema, hypertrophied adenoids and tonsils with white coating. Auscultation: rough vesicular breathing, prolonged expiration, dry rales and fine crackles bilateral. Wheezing and accessory respiration muscles involvement into breathing. Blood test showed neutrophilic leukocytosis and respiratory alkalosis. Chest x-ray: possible focal pneumonia. Dextrocardia. Cervical ribs. Polyostotic fibrous dysplasia of the ribs. Clinical diagnosis: main disease – acute pneumonia. Complications: respiratory alkalosis, hyponatremia and hypo-osmolality, ketonuria. Comorbidities: asthma exacerbation, acute follicular tonsillitis, acute ethmoiditis, congenital heart defects, 17p chromosome duplication, multiple developmental defects, III° hypermetropia of both eyes, unilateral renal agenesis, polydactyly and syndactyly. Surgical history: cleft lip and palate surgery, inguinal hernia surgery, tympanostomy. Planned surgeries: tonsillectomy, adenoidectomy, surgery of fingers defects.

Conclusion. This clinical case reflects a rare genetic disorder and its common symptoms. It requires many serious surgeries and persistent attentive care. There are a few clinical cases in a literature which help to expand the knowledge and improve maintenance of such disorder.

Summary. 3 years old boy was hospitalized in ICU with acute complicated pneumonia. He has frequent serious infections, multiple developmental defects which require many surgeries because of genetic disorder – 17p chromosome duplication.
QUALITY OF LIFE AND SEXUALITY IN PATIENT WITH MAYER-ROKITANSKY-KÜSTER-HAUSER SYNDROME

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Keywords. Müllerian agenesis, vaginal atresia, sexuality, self-esteem.

Introduction. Mayer-Rokitansky-Küster-Hauser syndrome (MRKHS) is congenital absence of uterus, vagina or both. It affects 1/5000 females. During adolescence they present with primary amenorrhea but otherwise are with normal pubertal development and secondary sexual characteristics. Vaginal dilation (VD) is the first line treatment but sometimes surgical therapy is necessary. Future parenting options include adoption, surrogacy and uterine transplantation. Patients have higher level of psychological distress but are satisfied with sexuality in case of proper treatment.

Case report. A 17 year old female presented with primary amenorrhoea and previously suspected absence of the uterus. On examination she had normal external genitalia, breasts, axial and pubical hair development. She had no comorbidities and wasn’t taking any medications. During the first visit pelvic ultrasound was performed showing normally developed ovaries with follicles and absence of uterus. To exclude presence of rudimentary uterine horns next to abdominal walls and confirm diagnosis of uterine aplasia, abdominal and pelvic magnetic resonance imaging (MRI) was performed. MRI findings suggested vaginal atresia, ovaries with uterine tubes and no uterus in its anatomical site or elsewhere. After confirmation of diagnosis, VD was chosen as a method of treatment and she performed it twice a day for 20 minutes. One month after initiating VD patient had successful sexual intercourse. At this point the patient has been in a committed relationship for 2 years and has had regular sexual intercourse for 5 months. During last appointment, her vaginal length was 9 centimeters and she used dilator with circumference of 3,5 centimeters. The patient was asked to fill out 1) Rozenberg self-esteem (RSES) and 2) female sexual distress (FSDS) scale. Patient scored 2 points out of 52 in FSDS, suggesting no sexual distress. Patients with MRKHS usually score 11 or more, which suggests sexual distress. In RSES patient scored 33 points out of 40, which suggests high self-esteem and is similar to the literature data.

Conclusion. The patient has no sexual distress and has high self-esteem. It can be attributed to good therapeutic outcomes and the fact that she doesn’t have any associated anomalies. Patient herself notes great support from family and her partner. Later on VD can be replaced with regular sexual intercourse which can aid the patient even more.

Summary. Patient with primary amenorrhoea was diagnosed with MRKHS. Her treatment plan included VD. At this point the patient is not affected by her congenital pathology neither psychologically nor physically.
VON WILLEBRAND DISEASE AS A SIGNIFICANT RISK FACTOR FOR HEMORRHAGE AFTER THE CERVICAL LOOP ELECTROSURGICAL EXCISION

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Keywords. Gynecology, surgery, von Willebrand disease.

Introduction. Loop electrosurgical excision procedure is the first-line treatment for cervical intraepithelial neoplasia (CIN), the effectiveness is significantly high, it is easy to perform and relatively safe, although 2% of patients have complications such as severe bleeding and infection. The complications are treated with antibiotics or suturing of the cervix with compelling results. We would like to present a case study of repeated cervical hemorrhages after the loop electrosurgical excision of cervix for a patient with previously unrecognized bleeding disorders.

Case report description. A generally healthy 38-year-old female was admitted to the Gynecology clinic for loop electrosurgical excision of cervix because of previously detected CIN II-III on biopsy. During the excision suspicious area was observed on the right lateral wall of vagina and the loop biopsy was done with following coagulation of this area. 10 days after the electrosurgical excision of cervix the patient was admitted to the Emergency department because of severe bleeding for 2 days. Suturing of cervix stopped the bleeding temporary. After this episode the patient was admitted to the Emergency department repeatedly 4 times because of severe cervical and vaginal bleeding. She received cervical and vaginal wall coagulation, repeated suturing of the cervix and vaginal wall and also hemostatic sponge was inserted to stop the bleeding. During the last admission hematologist was invited because there was a suspicion of a bleeding disorder. Analysis for von Willebrand factor and factor VIII showed evidence of the von Willebrand disease. Desmopressin injections and tranexamic acid was prescribed, but this therapy was insufficient, also the patient experienced side effects such as dizziness, nausea and palpitations. Then 1500 IU of VIII factor/von Willebrand factor concentrate for intravenous injections were prescribed and the bleeding was stopped completely.

Conclusion. This case study shows how important it is to consider underlying bleeding disorders for patients with severe repeated hemorrhage after the loop electrosurgical excision of cervix. It is relevant to find out the history of bleeding episodes, in order to recognize bleeding disorders and to be able to prepare properly for the procedure and avoid major complications.

Summary. A generally healthy 38-year-old female was admitted to the Gynecology clinic for planned loop electrosurgical excision of cervix; afterwards she was admitted to the Emergency department several times because of repeated vaginal bleeding. She received suturing and coagulation of the cervix and vaginal wall, but bleeding was stopped only when treated with VIII factor/von Willebrand factor concentrate. The laboratory analysis showed positive results for von Willebrand disease.
GESTATIONAL BREAST CANCER: A CASE REPORT

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Keywords. Gestational breast cancer, PATE, complications.

Introduction. Gestational breast cancer is a cancer which is diagnose during gravidity, in the postpartum period or any time throughout lactation. This cancer is a relatively rare pathology. The rate of pregnancy-associated breast cancer is approximately 15 to 35 per 100,000 deliveries. Significant reason of increased cases of pregnancy-associated breast cancer might be delay of childbearing.

Case report description. 38 year old woman admitted for a cardiologist consult to our clinics with shortness of breath and common weakening. Over a month patient went to a labor, had healthy born child. During the pregnancy there was no interferences, except for some changes in breast. At that time, it was considered as typical changes for pregnancy. Shortly after giving birth patient sought for reevaluation of her condition: the pain in chest area and right hand. This time were decided to make deeper investigation. Biopsy results showed adenocarcinoma, G3 with metastasis in regional lymph nodes – breast cancer. Lung perfusion scintigraphy revealed double sided, massive pulmonary artery tromboembolia. On cardiac echo sights of pulmonary hypertension, right ventricle overloading with pressure and functional tricuspid valve insufficiency was found, left heart chambers deformed. Abdomen ultrasound showed hepatomegaly with venous stasis, thrombosis of portal vein. Venous echo did not show any significant changes. Medical treatment included: furosemide, ivabradine, nexium i/v, metoclopramide, ondansetron i/v; bromazepam, dexamethasone. After three days in cardiac ICU patient status was getting worse. Blood pressure 78/61 mmHg, breath rate 25–30 times/min, SaO² – 98 %, HR- 97 times/min. Noradrenaline was addressed intravenously, and BP corrects to 114/84. Next day bone scintigraphy shows metastasis in bone marrow. Multidisciplinary team agreed with chemotherapy with doxorubicin, cyclophosphamide. Nevertheless, patient status was getting worse and she did not survive.

Conclusion. Our patient had many cancer complication: metastasis in regional lymph nodes, metastasis in regional lymph nodes, pulmonary hypertension, right ventricle overloading with pressure and functional tricuspid valve insufficiency, hepatomegaly with venous stasis, thrombosis of portal vein and metastasis in bone marrow. All these complications led to patient’s status worsening and inevitable death.

Summary. We report a rare condition which manifested during the pregnancy. It is crucial to examine any symptom at the time of pregnancy because overlooked gestational cancer can lead to fatal complication.
RAPIDLY PROGRESSIVE PHYLLODES TUMOUR OF THE BREAST

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Keywords. Phyllodes tumour, metastases, chemotherapy.

Introduction. Phyllodes tumours (PH) relate to a fibroepithelial tumour group. The incidence is 0.5% of all malignant breast neoplasms.

Case report description. On March 26 2015 45 years old female, admitted to LOC with diagnosis of bilateral multiple neoplasms of breasts. A well-bordered fibroadenomas, largest 2 cm diameter. A right breast sectoral excision was performed and sent to histology – PH was confirmed. Patient was advised to follow up. One year later patient did an ultrasound, in which multiple bilateral breast neoplasms still presented. On June 15 patient admitted to the hospital due to hematoma of right breast. Ultrasound guided drainage was done under a local anesthetic and 2.2 liters of sanguineous fluid was removed. MRI revealed a local relapse of PT in the right breast. Core biopsy was performed and revealed invasive growing malignant PT. Right mastectomy was performed followed by radiation therapy for supraclavicular lymph nodes and mastectomy scar. Histological examination revealed malignant phyllodes tumour (11 × 6 × 17 cm), one lymph node with no cancer cells. Control CT scan revealed metastasis with cavities in the lungs. On January 1 2017 first course of palliative chemotherapy with gemcitabine and docetaxel was introduced. Ten days’ post chemotherapy, patient admitted to the hospital with shortness of breath. X-ray showed bilateral pneumothorax. Bilateral VATS talc pleurodesis was performed, a biopsy was taken – highly malignant carcinoma. Patient received second line palliative chemotherapy with ifosfamide and doxorubicin. After three cycles of chemotherapy, CT scan showed shrinkage of lung nodules. On August 15 2017 new metastases in bones and lungs were diagnosed. The third line palliative chemotherapy was prescribed. After two cycles patient’s condition worsened, chemotherapy was discontinued and best supportive care was provided.

Conclusion. PT can occur in all age groups. Benign PT is similar to fibroadenomas but malignant PT appears like primary breast sarcoma. MED12 somatic mutations was discovered insisting the convenient molecular relationship. The first step treatment is surgery. Local recurrence rates vary. Approximately 15% of malignant PT gives metastases with poor prognosis, less than 2 years’ survival time. Mono- or poly-chemotherapy can be prescribed. The merits of systemic therapy are therefore considered on case-by-case basis.

Summary. PT must be included in differential diagnose considering patients age, rapid growth and tumour size. Surgical treatment is the first step. Adjuvant radiation is used to improve local control. Palliative chemotherapy with cisplatin, etoposide, ifosfamide alone or in combination with doxorubicin have been proven to be effective.
V-SHAPE VASCULARIZED FIBULA GROWTH PLATE FOR LONG SEGMENT TIBIAL RECONSTRUCTION

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Keywords. Tibial reconstruction, Ewing sarcoma.

Introduction. Ewing sarcoma is rare malignant bone cancer. Goals of treatment are radical resection of primary tumour, preventing metastatic spread, provide best possible functionality and quality of life. Studies have shown, that amputation of diseased extremity does not increase survival rate, besides has negative impact on quality of life. Nowadays few options are available for long segment tibial reconstruction. Synthetic prosthesis can be used, but has an elevated risk of infection, which might lead to amputation. Allograft bone transplant is possible, but it’s difficult to find donor for paediatric patients, immunosuppressive therapy is required. Rotationplasty has good functional results, but pure aesthetic results. None of these options provide limb growth. We present a surgical technique, which provides radical treatment, functionality and possibility for limb growth.

Case reports. Two male patients (age 12 and 4) were treated with Ewing sarcoma in tibial bone. Resection zone included proximal metaepiphysis, half of diaphysis. To reconstruct the segment two fibular flaps were used. One as pedicle flap, second as free flap. Pedicle fibular flap was advanced till lateral tibial condyle. Free fibular flap from contralateral leg was placed against medial condyle. Diaphysis received blood supply via peroneal artery. To provide blood supply for growth plate, epiphysial branch from anterior tibial artery was included in the flap. Distal parts of the flaps were positioned against distal part of tibia, thus forming V-shape pattern. Osteosynthesis was done using non-elastic intramedullar nails.

First patient was treated at age of 12, second – at age of 4. Follow-up was performed 2 years after reconstruction. Both patients are disease free and able to walk using ankle splint. Patients scored 65.4 and 62.5 in The Foot & Ankle Disability Index, 45 and 42 in Lower Extremity Functional Scale. 80° and 115° active flexion and full extension in the knee is achieved with no joint instability. Radiography in first patient showed open growth plate in medial fibular flap, 15° varum deformity and 18° posterior recurvation, in second patient lateral fibula head subluxation was recorded.

Conclusion. Tibial reconstruction with V-shape fibular vascular growth plate flaps is the only option to provide radical treatment, satisfactory functionality and preserve limb growth for paediatric patients with long segment defect in the tibial bone.

Summary. Two male patients with Ewing sarcoma in tibial bone were treated using two vascularized fibulas with growth plates. Long-term results showed that technique provides radical treatment, good functionality and preserves limb’s growth.
THE ROLE OF BONE SCINTIGRAPHY IN MONITORING OF $^{223}$Ra THERAPY EFFICACY IN CRPC PATIENTS WITH BONE METASTASES

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Keywords. Bone scintigraphy; CRPC; Radium-223 dichloride; $^{223}$Ra, Xofigo.

Introduction. The majority of patients with castration-resistant prostate cancer (CRPC) eventually develop bone metastases with associated skeletal-related events, such as pain, pathological fractures and spinal cord compression. The recently introduced α-emitting radiopharmaceutical $^{223}$Ra-dichloride, unlike its β-emitting counterparts, has been demonstrated to prolong overall survival and time to onset of skeletal-related events in CRPC patients with bone metastases. According to a 2017 Advanced Prostate Cancer Consensus, bone scintigraphy and computed tomography (CT), in addition to prostate-specific antigen (PSA) and alkaline phosphatase, are the preferred imaging modalities for evaluation of $^{223}$Ra treatment efficacy.

Case report description. This case report presents two CRPC patients (age 63 and 75) with numerous bone metastases in the absence of visceral metastases who had exhausted chemotherapy options and subsequently received six standard courses of $^{223}$Ra treatment. They demonstrate distinct post-treatment outcomes: one stable and one progressive, as shown by PSA, alkaline phosphatase levels and change in clinical symptoms. CT and bone scintigraphy scans were performed prior to and after treatment. The bone scintigraphy scan of stable disease patient demonstrates no new metastases and lower radionuclide uptake of existing metastases, while the bone scintigraphy scan of progressive disease patient indicates numerous new bone metastases and enhanced radionuclide uptake of existing metastases. CT scans clearly display new metastases, but the presence of existing metastases appear similar in pre- and post-treatment images.

Conclusion. $^{223}$Ra treatment is a promising new palliative treatment option with favorable safety profile for castration-resistant prostate cancer patients. However, as this case report illustrates, not all patients fully benefit from the treatment. Results suggest that bone scintigraphy cannot be entirely replaced by a CT scan in this setting: bone scintigraphy is able not only to detect new metastases, but also monitor response of existing metastases to treatment.

Summary. Two CRPC patients treated with Radium-223 dichloride present with opposite clinical outcomes: one stable and one progressive disease. Bone scintigraphy scan was the only imaging modality being able to detect the effectiveness of the drug on the existing pre-treatment bone metastases.
THE MANAGEMENT OF A PATIENT WITH A CERVICAL DISC HERNIATION: A CASE REPORT

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Keywords. Cervical disc, herniation, spinal canal stenosis, discectomy, Zero-P cage.

Introduction. The spine is a two-part structure. First, the vertebral column and second, the neural contents, the spinal cord and nerve roots. Spinal disease presents with pain and/or loss of neurological function. Symptoms can be described as radiculopathy or myelopathy. Long tract involvement is also common. Intervertebral discs provide cushion by being able to take and disperse pressure with compression. The most common area to have a disc herniation is posterior laterally due to the posterior longitudinal ligaments being relatively weak compared to the other structures containing the disc. The most common levels of cervical disc herniation are C5-6 and C6-7.

Case report description. The patient was a 54-year-old white male diagnosed with cervical disc herniation at the levels of C4-5 and C5-6 confirmed with MRI. He was presented by ambulance to University Clinical Centre Ljubljana Neurology clinic on 19.11.2017. complaining of severe weakness of left lower extremity and difficulty walking. Patient also had chronic neck pain, weakness and numbness in upper extremities and tingling in index finger of the right hand. Patient’s past medical history includes left shoulder rotator cuff surgery in 2015. On examination there is no decrease in cervical movements, no palpable findings. Hyperreflexia in upper and lower extremities, Babinski reflex negative. Weakness in upper extremities (left arm more prominent). 29.11.2017. patient was operated with preoperative diagnosis: Spinal canal stenosis C4–C6, spastic paraparesis, myelomalacia. Manipulations performed were anterior discectomy C4–C5, C5–C6, excision of osteophytes and posterior longitudinal ligament in mentioned segments. After discectomy Zero-P cage was inserted into empty disc spaces. Epidural drainage was inserted. After the surgery patient received medicament treatment with Sterofundin, Pantoprazol, Analgin, Piritramid. Control x-ray was performed and no pathology/complications were noticed.

Conclusion. Patient was discharged 5 days after the surgery with decreased neck pain, tingling in arms, weakness in left arm, pain in the right side of the face. No gait problems were observed. The patient will start recovery in rehabilitation and has to attend check-up after 3 months. Medicament treatment is not prescribed.

Summary. Anterior discectomy and Zero-P cage insertion in the cervical spine resulted in partial resolution of patient’s neck and arm symptoms. Cervical disc herniation may present with contralateral symptoms that are different from the current perception of this disease. The Zero-P device is safe and efficient treatment.
EARLY PRESENTATION OF DEVIC’S DISEASE

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Keywords. Devic’s disease, optic neuritis, myelitis, MRI.

Introduction. Devic’s disease, also known as neuromyelitis optica, is an autoimmune inflammatory disorder of the central nervous system. This disorder is characterized by the presence of a highly specific antibody against aquaporin-4. Devic’s disease predominantly damages the spinal cord and optic nerves. Pediatric-onset of Devic’s disease is rare, and it constitutes up to 5% of demyelinating diseases acquired in childhood.

Case report. A 3-year-old girl presented with worsening vision of the right eye after varicella infection. Magnetic resonance imaging (MRI) of the head was performed, which revealed edematous optic tracts with hyper-intensity on T2-weighted images. The patient received intravenous immune globulin and prednisolone for initial acute attack treatment and was discharged to continue treatment with oral glucocorticoids. Despite the use of medication, two months later acute paraparesis developed and the patient presented with difficulty in standing and walking. Brain and spinal cord MRI scans demonstrated swollen spinal cord with longitudinally extensive hyper-intense lesions on T2-weighted images. Four months later the patient regained the ability to walk, but visual impairment progressed and led to total blindness of the right eye. Follow up MRI showed decreased swelling of the spinal cord and less intense signal compared to previous studies on T2-weighted images.

Conclusion. The presentation of Devic’s disease at the age of this patient is unusual. This disorder is a rare cause of demyelinating process in children and adults. The main task in creating the differential diagnosis is to distinguish Devic’s disease from multiple sclerosis because of differences in prognosis and therapy. MRI is one of the major arbiters in helping to distinguish these two conditions. This diagnostic tool detects specific MRI findings of the optic nerve, spinal cord and brain.

Summary. This case underlines the need of awareness of rare causes of demyelinating disorders, such as Devic’s disease, and the importance of MRI for the differential diagnosis.
SARC OIDOSIS OF THE OPTIC NERVE

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Keywords. Optic nerve, sarcoidosis.

Introduction. 1–5% of patients diagnosed with systemic sarcoidosis develop injury to an optic nerve. However, an isolated optic nerve sarcoidosis is extremely rare, hence, a correct diagnosis becomes very complicated. To our knowledge, there are 25 cases of isolated optic nerve sarcoidosis described in literature. With this case report we present one more case of this uncommon pathology.

Case report description. A 30 years old previously healthy male was complaining of a deteriorating vision with his left eye for year and a half. He was diagnosed with retrobulbar neuritis and treated with steroids. His condition improved only temporarily. Magnetic resonance imaging (MRI) scan revealed mass in a distal part of the left optic nerve enhancing contrast. 3 Tesla MRI was repeated and a negative dynamics was observed – a mass increased in size and reached an optic chiasm. No other pathology was found. General condition was stable. A differential diagnosis was unclear and suggested between glioma, lymphoma, ganglioglioma and other mass forming pathologies. Left lateral supraorbital craniotomy was performed. Macroscopically the mass resembled a tumour, yet, intraoperative biopsy showed no tumour and changes were similar to granulomatous neuritis, most resembling sarcoidosis. It was decided not to remove the mass. Waking up after the anaesthesia was complicated, head computed tomography showed no haemorrhage, but tension pneumocephalus was suspected. Nevertheless, the patient recovered soon. Treatment with glucocorticoids was administered. Vision with the left eye did not worsen. Final diagnosis was left optic nerve sarcoidosis. Chest X-ray showed no pathological changes. No other pathological findings typical for sarcoidosis were found. Postoperative follow up was uneventful.

Conclusion. Optic nerve sarcoidosis differential diagnosis is difficult and wide. It is usually made between optic nerve glioma and meningioma. Due to its unusual presentation intraoperative biopsy might be the only method to determine the right diagnosis. Only the right diagnosis allows prescribing a correct treatment.

Summary. A young male had worsening vision with his left eye for year and a half. He was treated from retrobulbar neuritis, but his condition declined. Head MRI revealed a contrast enhancing mass in left optic nerve. A tumour was suspected. Craniotomy and mass biopsy was performed. Histological examination showed left optic nerve sarcoidosis. No other pathological findings typical for sarcoidosis were found in a body. Isolated left optic nerve sarcoidosis was diagnosed. Treatment with glucocorticoids was administered. Only 25 cases of isolated optic nerve sarcoidosis were described before.
ADRENOLEUKODYSTROPHY AS PROBABLE CAUSE OF RAPIDLY PROGRESSIVE ATAXIA

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Keywords. Adrenal insufficiency, ataxia, adrenoleukodystrophy.

Introduction. Adrenoleukodystrophy (ALD) is X-linked recessive disorder with prevalence 1:20000. Adult-onset cerebral ALD is extremely rare and compiles only 1–3 % of cases. This clinical case represents unusually late onset of the disease with rather characteristic findings.

Case description. A 69-year-old man was admitted to Riga East Clinical University Hospital with shortness of breath and fatigue. Due to previous history of cardiovascular diseases and persistent heart failure NYHA III patient was hospitalized to Cardiology unit and received therapy for decompensated heart failure. Few days after admission patient developed cognitive decline and neurological examination was performed. The results revealed confusion, ataxia, dysphonia and dysarthria, GKS = 15. Head MRI and lumbar puncture was performed. Cerebrospinal fluid analysis showed increased protein (0.51 g/L) and glucose (5.29 mmol/L) levels with normal leukocyte count. Screening for HSV, VZV, CMV, EBV, HIV, syphilis, tick-borne encephalitis and neuroborreliosis was negative. MRI scan showed supratentorial hyperintense changes suggestive for leukodystrophy. Patient received 1 g of Methylprednisone without improvement, his condition worsened, sitting and walking without support became impossible and cognitive decline progressed with MoCA test result of 15/30. Nerve conduction study revealed sensory-motor axonal demyelinating polyneuropathy in legs and arms. According to patient’s son first signs of gait and balance disturbances appeared 3 years ago. Metabolic cause was suspected and endocrinologist recommended to check cortisol level. Blood test showed up decreased cortisol level in blood (1.6 µg/dL) and urine (0 µg/dL) approving adrenal insufficiency. Patient received Hydrocortisone 20 mg and Fludrocortisone 50 µg daily per os. Considering clinical manifestations, radiological and laboratory findings probable ALD was suspected and patient was discharged from the hospital with recommendations to continue hormone therapy and perform genetic tests to confirm diagnosis.

Conclusion. Radiologically confirmed cerebral leukodystrophy combined with adrenal insufficiency, sensory-motor polyneuropathy, cognitive impairment and progressive ataxia is highly suggestive for X-linked ALD. Definite diagnosis require genetic testing and increased level of very long fatty chain acids in plasma.

Summary. Gait and balance disturbances and cognitive decline are non-specific symptoms often mistakenly associated with normal process of aging. Nevertheless, progressing ataxia should raise suspicion and require scrupulous investigation for underlying cause.
EPILEPSY SIMILAR TO ENCEPHALITIS

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Keywords. Panayiotopoulos syndrome, childhood epilepsy, encephalitis.

Introduction. Epilepsy is one of the most common neurological disorders during childhood. Although doctors easily recognize seizures, epilepsy may have less common symptoms which results in incorrect diagnosis.

Case report description. An 8 years old boy was admitted to the hospital with headache, vomiting, weakness, head deviation to the left.

From past medical history was known about tick bite 5 month ago, but the boy was vaccinated from tick-borne encephalitis. Patient’s mother told that vomiting happens approximately once in a month. That lead to the boy being previously examined but nothing abnormal was found.

During physical examination patient’s level of consciousness was 12/15 scores in GCS. There were eyes and head deviation to the left, hypertonic left limbs, spontaneous Babinski reflex, positive meningeal signs. The diagnosis of encephalitis was suspected and treatment was initiated with Acetazolamide and Mannitol. Patient’s condition gradually improved, but the vomiting remained. Head CT, MRI with contrast, lumbar punction showed nothing abnormal.

Anti-NMDAR, anti-AMPAR1, anti-AMPAR2, anti-CASPR2, anti-LGI1, anti-GABAR B1/B2, IgG and IgM antibodies against B. Burgdorferi were not found. Eventually the EEG was performed. During sleep intermittent epileptic activity was observed in right temporal and occipital lobes of the brain and Panayiotopoulos syndrome (PS) was diagnosed. Treatment with Sulthiame was prescribed and since then the patient showed no symptoms and was discharged from the hospital.

Conclusion. PS symptoms may be mistaken as acute symptomatic seizures such as in encephalitis or other disease, such as gastroenteritis. Therefore, to identify and cure the disease it is important to know different types of epilepsy and their symptoms.

Summary. PS is a common childhood epilepsy syndrome which may be difficult to recognize. This case report represents PS which was mistaken with encephalitis because of previous medical history of tick bite and similar to encephalitis clinical symptoms. Therefore laboratory and imaging studies, lumbar punction were performed to confirm this diagnosis but they showed nothing abnormal. Eventually, the EEG showed intermittent epileptic activity during sleep and PS was diagnosed. Adequate treatment was prescribed and patient was sent home. This case report shows that sometimes it may be difficult to diagnose epilepsy when it has less common symptoms.
MAL DE DEBARQUEMENT SYNDROME CLINICAL SERIES

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**Keywords.** Mal de Debarquement syndrome, vestibular system.

**Introduction.** Mal de Debarquement syndrome is a rare and incomprehensible disorder of the vestibular system. Diagnosis of the syndrome is difficult due to uncertain pathogenesis. We present a series of clinical cases of patients with Mal de debarquement syndrome.

**Clinical series description.** 1\textsuperscript{st} clinical case: a 39-year-old patient referred to the Vilnius University Hospital, Santaros Clinic, ENT department for 1 month lasting dizziness after a flight. In addition to dizziness, the patient complained of a feeling of instability, strong general weakness, nausea, vomiting, and difficulty walking. Dizziness is troublesome daily. The patient was consulted by neurologists, but prescribed treatment had no effect. The patient underwent clinical and instrumental examinations of the vestibular function: head-impulse test, videonystagmography: spontaneous nystagmus test, positional samples, caloric test, rotary, oculomotoric tests and computer posturography; All tests were within the normal range.

2\textsuperscript{nd} clinical case: A 35-year-old woman referred to the VUH SC ENT department for a 1-month period of dizziness which started immediately after a flight. Dizziness has a sudden start, patient complains of feeling unstable and tingling of hands during an episode of dizziness. Dizziness is felt daily. The patient had a clinical and instrumental examination of the vestibular function, all tests were within the normal range.

Both patients were tested with a MRI, to reject structural changes. Head MRI was within the normal range.

**Conclusion.** Based on the anamnesis, objective and physical examinations, both patients were diagnosed with Mal de Debarquement syndrome.

**Summary.** Mal de Debarquement syndrome is a rare otoneurological disorder characterized by dizziness after an effect of a prolonged passive movement. It usually occurs after a trip with a boat, an airplane or even a train or a car. The exact prevalence of the disease is not known, and is usually diagnosed in women aged 40–50 years. Key features include rocking, bobbing, swaying, often accompanied by a feeling of instability and imbalance. Since the pathophysiology of the Mal de Debarquement syndrome so far has not been completely clear, diagnosis and the choice of appropriate therapy are both complex. Neurological and ENT testing is within the normal range.
CLARKSON DISEASE – IDIOPATHIC SYSTEMIC CAPILLARY LEAK SYNDROME: THE FIRST CASE IN LATVIA

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Keywords. Clarkson disease, idiopathic systemic capillary leak syndrome, hypoalbuminemia, hemoconcentration.

Introduction. Idiopathic systemic capillary leak syndrome (ISCLS) is a rare disorder which was first described by Clarkson in 1960. The main symptoms of ISCLS are hypotension or shock, hemoconcentration, and hypoalbuminemia due to a sudden shift of fluid and macromolecules from the intravascular space to the interstitial space. (Duron et al., 2015) This case is the first one in Latvia.

Case report description. A 26-years old male was admitted to hospital with recurrent episodes of syncope and with complaints about pain and impaired sensation in legs. Patient was hypotensive (BP – 100/50 mmHg), with tachysystole (114 ×/min) and high hemoconcentration (Hb 224 g/l). Echocardiographic findings showed right sided cardiac tamponade. In ICU pericardiocentesis was performed, but hypotension progressed despite intensive hydration; catecholamines were introduced. Fast developed edema in legs and arms inducing compartment syndrome with secondary periferal polyneuropathy. Laboratory results showed hypoalbuminemia and initial DIC syndrome; Albumin and Antithrombin III transfusions and uninterrupted hemodialysis were started. Serum protein electrophoresis showed paraproteinemia. Based on clinical signs and investigation results the diagnosis was confirmed on the 4th day – Idiopathic systemic capillary leak syndrome – Clarkson disease. Symptomatic therapy was performed. Profilactic treatment with i/v Immunoglobulins 2 g/kg/day to avoid future episodes were initiated. The general condition of the patient stabilized and on the 10th day he was barely able to walk with assistance. Physiotherapy was started. He was discharged on the 20th day and still being treated with i/v Immunoglobulin therapy once a month.

Conclusion. ISCLS must be considerable as differential diagnosis in cases of hypotension, hemoconcentration and / or hypoalbuminemia. Patients with ISCLS should be carefully monitored in ICU, because haemodynamic instability is frequent, but an early diagnosis can prevent serious complications.

Summary. This case report describes rare disease – Idiopathic systemic capillary leak syndrome – Clarkson disease – and demonstrates that it could be successfully treated if diagnosis is confirmed as soon as possible.
RAPIDLY PROGRESSIVE INTERSTITIAL LUNG DISEASE IN A PATIENT WITH SYSTEMIC SCLEROSIS

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Keywords. Cyclophosphamide, interstitial lung disease, methotrexate, rapidly progressive systemic sclerosis.

Introduction. Systemic sclerosis (SSc) is an autoimmune disease of multiple organ systems, characterized by the fibrosis of the skin and internal organs as a result of overproduction of extracellular matrix components. The most commonly affected organs are esophagus, lungs, heart and kidneys. Rapidly progressive SS is a life-threatening disorder that manifests by rapid involvement and deterioration of multiple visceral organs. According to 2017 European League against Rheumatism (EULAR) recommendations, methotrexate is effective in improving the fibrosis of the skin in early diffuse SSc. However there is currently no evidence of its usefulness in visceral organs fibrosis.

Case report. 44-year-old female presented with symptoms of fatigue, fever, weight loss, shortness of breath, dysphagia and faecal incontinence. Clinical signs included hyperpigmentation and thickening of the skin in the chest and facial area, Raynaud’s phenomenon and digital stiffness with calcinosis and intermittent ulceration. The duration between the first symptoms and diagnosis of systemic sclerosis was 7 months. Due to rapid progression of the disease and young age, autologous hematopoietic stem cell transplantation (HSCT) was considered, however, given high risks of HSCT, the initial therapy of methotrexate (20 mg subcutaneously once a week) was chosen. After 6 months of treatment, the patient developed significant pulmonary fibrosis (TLC decreased from 70 to 44%, DLCO decreased from 48 to 27%) and atrial fibrillation, at which point methotrexate was changed to cyclophosphamide.

Conclusions. This case report highlights the seriousness of rapidly progressing systemic sclerosis. It is important to carefully consider the indications of medications and their safety prior to treatment. Appropriate management requires frequent consultations with rheumatology specialists and careful evaluation of visceral organ involvement.

Summary. Rapidly progressive systemic sclerosis is a life threatening condition which requires extensive systemic evaluation, careful lung function monitoring and rapid immunosuppressive treatment.
A RARE CASE OF LUNG ADENOCARCINOMA WITH ROS1 MUTATION IN A YOUNG WOMAN

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Keywords. Lung adenocarcinoma, ROS1 mutation, Crizotinib, thrombophilia.

Introduction. ROS1 gene mutation is a rare mutation that leads to the development of lung and other cancers. It occurs in 1 to 2% of lung adenocarcinomas, most commonly in young non-smoking women. Such case in Latvia is described first time. Lung adenocarcinomas frequently are accompanied by paraneoplastic syndromes that may start long before the cancer is detected. The patient presented here developed thrombophilia which manifested as deep vein thrombosis with pulmonary embolism several months before cancer diagnosis was put.

Case report description. A 39-year-old non-smoking female was transferred from Balvi and Gulbene hospital to Pauls Stradiņš Clinical University Hospital on 15.01.2016 due to suspected acute myocarditis, acute pericarditis and heart failure. Since December 2016 the patient had non-productive cough, sense of pressure in the chest and dyspnea. Computed tomography of the heart revealed a structure (a thrombus) in the right ventricular cavity and pulmonary thrombi in both lungs. After video-assisted thoracoscopy and marginal resection of the lung for histological examination the lung adenocarcinoma at III B stage was diagnosed.

The patient was included in a clinical research programme and received six courses of first-line palliative chemotherapy with Pemetrexed/Cisplatin, two courses of second-line palliative chemotherapy with Docetaxel and one course of third-line palliative chemotherapy with Carboplatin/Etoposide. After this course the computed tomography imaging revealed the tumour metastasis in the vertebral body. Due to this finding the stage of the disease was changed to IV. In parallel the treatment with Orfarin and Fraxiparin was followed up for thrombosis prevention.

However despite the therapy the disease progressed. Eleven months after the diagnosis was established the tumour sample was tested for ROS1 mutation. As the test result was positive, specific therapy with a ROS1 receptor tyrosin kinase inhibitor Crizotinib was started. First time this specific therapy gave significant improvement, but after one-month the therapy had to be stopped owing to problems in financing. At 10.06.2017 patient died due to brain metastasis.

Conclusion. If lung adenocarcinoma is diagnosed in a young non-smoking person, it is important to perform genetic testing to reveal ROS1 mutation as early as possible and to start a specific therapy with a ROS1 receptor kinase inhibitor Crizotinib. Also, if a patient develops primary thrombophilia first time in his life it is important to consider possible neoplastic syndrome and perform necessary examinations to exclude possible lung cancer.

Summary. The case demonstrates a young, non-smoking woman with adenocarcinoma of the lung with ROS1 mutation and thrombophilia as a paraneoplastic syndrome. As the precise diagnosis and specific treatment was started, lately patient died due to metastatic spread of the disease.
PLEURAL EFFUSION AS A FIRST RADIOLOGIC SIGN OF AORTIC PATHOLOGY

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\textbf{Keywords.} Pleural effusion, aortitic aneurysm, aortitis.

\textbf{Introduction.} Aortic diseases are life-threatening conditions. The primary imaging method for them is contrast-enhanced computed tomography (CT) where these diseases show abnormalities of wall thickness, density and vascular diameter. Infectious aortitis is a rare disease that most often manifests itself by an aortic aneurysm. In most cases etiology are \textit{Salmonella}, \textit{Staphylococcus aureus} and \textit{Treponema pallidum}. Aortic pathology may present with pleural effusion, radiologically about 27–38\% of cases.

\textbf{Case report description.} A 70 years old woman, nonsmoker was admitted to hospital with a history of fewer for two days, nonproductive cough, chest pain which irradiates to back and left shoulder for about one week. It is known that patient had arterial hypertension, controlled with antihypertensive medication. In emergency unit CT with intravenous contrast was made, where visualized pleural effusion 1.0–1.5 cm in left pleural space. Laboratory tests showed WBC $-13.2 \times 10^{9}$/L, C reactive protein $-152$ mg/L. Empirically started antibiotics with Amoxicillin, later Tazobactam / Piperacillin, both with no clinical effect. Six days later control CT detected an aortic arch aneurysm, most likely infectious with reactive pneumonia and pleural effusion in left side. Digital subtraction angiography showed partial ulceration in an aortic arch. Autoantibodies to rheumatologic diseases, blood culture, TPHA and RPR tests for syphilis were negative.

\textbf{Conclusion.} The patient underwent endovascular aortic prosthesis surgery with no complications.

\textbf{Summary.} Unspecific clinical symptoms may lead to delayed diagnosis of aortic pathology. Contrast-enhanced computed tomography is essential for confirmation of diagnosis. As in our case first CT did not show changes in aortic wall, but the only finding was pleural effusion. Making control CT in unclear cases is important. As in our case second CT was made and radiologic results suggest that this was most likely infectious aortitis, but the source of infection or other inflammatory disease has not been identified.
SEVERE SEROTONIN SYNDROME AND DEATH OF 20-YEAR-OLD MALE PATIENT CAUSED BY LOBAR PNEUMONIA AND 3,4-METHYLENEDIOXYMETHAMPHETAMINE USE

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Keywords. Serotonin syndrome, pneumonia.

Introduction. Serotonin syndrome is a rare life-threatening condition that may occur following use serotonergic medications or drugs and is well described in a literature. Even less often serotonin syndrome is diagnosed in young previously healthy patients.

Case report description. Patient admitted in Riga East Clinical University Hospital Emergency department in critical condition with severe hyperthermia (over 42 °C) and shock. Patient’s grandmother was awaken early in the morning by his scream, find a patient awake, psychomotor agitated, patient had clonic seizures with no reaction to irritation. Information given by relatives – patient came home after party last evening with no symptoms of any illness and felt healthy before. Upon arriving blood pressure was 71 / 43 mmHg, HR 130 BPM, SpO₂ 92 %. Laboratory finding: leucocytosis 15.88 10e9/L, K+ 8.92 mmol/L, Glu 3.08 mmol/L, CK-MB 574.68 U/L, LDH 976.57 U/L, Troponin T-HS 922.3 ng/L, creatinine 194.68 mkmol/L, ASAT 449.13 U/l. pH 7.124, pCO₂ 70.3 mmHg, pO₂ 82.8 mmHg. Streptoccocus Pneumoniae antigen express test was positive.

CT scan of thorax showed pneumonia of upper lobe of right lung; CT scan of brain showed initial cerebral edema. Sepsis caused by pneumonia and multiorgan failure was treated firstly. 55 minutes after admission, cardiac arrest (ventricular fibrillation) occurred. 60 minutes CPR was without effect and patient died.

Toxicological test results received after patient’s death – MDMA (Ecstasy), Marijuana and ethylenglycol found in urine sample.

Autopsy performed the next day showed petechial spots on the surface of epicardium, liver, spleen and lungs; erythrocytes extravasation and lymphocytic infiltration, as a result of drug overdose. Also, regions with acute ischemic zones in myocardium were found. Pneumonia was found in the upper lobe of the right lung in the stage of red hepatization.

Conclusion. Hyperacute manifestations, non-specific symptoms, pneumonia and the rarity of serotonin syndrome decelerated the ability to determine correct preliminary diagnosis and start specific therapy. Express drug tests would be useful in cases with unclear anamnesis and typical presentation of serotonin syndrome.

Summary. The case report describes severe serotonin syndrome and death, that caused by complete serotonin receptors saturation that led to: central genesis hyperthermia; muscles hyperactivity resulted as rhabdomyolysis and acute hyperkalemia; activated noradrenergic system, damage of coagulation equilibrium.
8 YEARS WITH A FIXED FRAGMENT OF TUNNELED DIALYSIS CATHETER IN CENTRAL VEINS: INFECTION DENIED WITH PET

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Keywords. Hemodialysis, tunneled dialysis catheter, catheter-related bloodstream infection, positron emission tomography.

Introduction. Hemodialysis (HD) is an essential treatment option for end stage renal disease (ESRD). When native vessels are exhausted and there is no possibility to make an arteriovenous fistula (AVF), the last option for HD access is tunneled dialysis catheter (TDC). All types of intravascular devices pose a risk of infection. TDC frequently causes catheter-related bloodstream infection (CR-BSI), thus requiring TDC removal and antibacterial therapy. Duration of catheterization, underlying chronic diseases and HD itself are risk factors for CR-BSI.

Case report description. In this paper we report a 53 year old female patient diagnosed with ESRD due to chronic glomerulonephritis. The patient has been on HD for seven years and she was referred to the emergency room due to AVF thrombosis. The condition was confirmed by venous ultrasound of left hand. Concerning anuria, the patient required urgent HD. According to the past history, she had a fragment of previous TDC, which was cut during removal eight years ago after unsuccessful removal. Chest X-ray showed a fragment of TDC fixed to the right internal jugular vein, inferior vena cava and right atrium. The new line was placed through the left jugular vein and HD was started. Patient was diagnosed with CR-BSI caused by MRSA on the fifth day of hospitalization. Positron emission tomography (PET) denied TDC fragment as a possible source of infection, therefore open current surgery and fragment removal was not attempted. Superficial veins of right hand were not eligible for AVF formation, and the patient stayed on HD via TCD on the left side.

Conclusion. Foreign body is always a possible cause of bloodstream infection, thus it is important to see the doctor when any signs of infection, such as temperature > 38 °C, chills, disorientation, hypotension or respiratory failure are noticed. The patient was advised to reconsider peritoneal dialysis as an alternative treatment with less risk for infection.

Summary. A 53 year old woman on HD was referred due to thrombus in the arteriovenous fistula. While was considering the technique of access, the patient informed about a fragment of TDC left in her body for almost past 8 years. This was confirmed by chest x-ray. New HD catheter was placed through the left veins. Any sings of infection should be evaluated properly as foreign body could cause bloodstream infection later in life, and PET is a tool to evaluate the suspicion of infection.
PULMONARY VEIN OCCLUSION AFTER PULMONARY VEIN ABLATION FOR ATRIAL FIBRILLATION:
A CASE REPORT

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Keywords. Atrial fibrillation, vein ablation, vein stenosis, occlusion, lung, lobectomy.

Introduction. Pulmonary vein stenosis (PVS) is a life-threatening complication of pulmonary vein ablation (PVA) for atrial fibrillation (AF) especially when it leads to an occlusion. When the decrease of lumen size is haemodynamically significant it may cause symptoms such as: general weakness, shortness of breath, haemoptysis. We present a case of a pulmonary vein occlusion (PVO) after PVA for AF with successful treatment and good post-operative outcomes.

Case report. A 54-year-old man who had a non-treated PVS after a PVA procedure for AF 7 months ago admitted to the emergency room complaining about shortness of breath, chest pain and haemoptysis. Coarse crackles on lower parts of left lung were heard when auscultating. CT scan with contrast angiography showed consolidation and areas of atelectasis of the left lower lobe and absence of communication between the left inferior pulmonary vein (LIPV) and the left atrium. To confirm the diagnosis lung perfusion/ventilation scan was accomplished which demonstrated that the left lung was receiving only 15% of the overall lung perfusion. We tried to recanalize LIPV with balloon angioplasty and further stent implantation twice with no success. As patient’s status became worse serohemorrhagic fluid was found in his left pleural cavity. Repeated CT scan indicated an increasing damage of the lung therefore it was decided to perform a lobectomy. Intra-operative findings were obliterated LIPV as well as solid and atelectatic lobe which had multiple adhesions with parietal pleura and diaphragm. Histopathologic examination of the surgical material was carried out which showed no evidence of neoplasia. With no shortness of breath or other previous symptoms and with vesicular breath sounds on the remaining sites of the lungs our patient was discharged 6 days after surgery.

Conclusion. A transcatheter approach for recanalizing pulmonary vein is a “gold-standard” therapy for early stages of PVS. However delayed cases of PVS can lead to more serious problems such as PVO with losing a particular lung section. The latter problem requires a resection of the damaged lung site to restore patient’s health. If a patient has a sensation of PVS symptoms immediate chest CT scan with angiography or MRI scan should be performed to determine an early stage of this disease.

Summary. It is a case of pulmonary vein occlusion after pulmonary vein ablation for atrial fibrillation. Traditional treatment failed therefore a lobectomy was performed. After surgery patient’s health recovered rapidly and no previous symptoms have persisted.
MANAGEMENT OF PATIENT WITH DYSPHAGIA AORTICA AND AORTOESOPHAGEAL FISTULA

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Keywords. Aortic aneurysm, dysphagia aortica, aortoesophageal fistula.

Introduction. Aorto-esophageal fistula (AEF) is a very rare cause of upper gastrointestinal bleeding. The connection between ascending aortic aneurism and esophagus is typically caused by aortic prosthetic grafts. Difficulty swallowing, occurring in patients with thoracic aortic aneurisms, is a late presentation and is called dysphagia aortica. This condition is commonly found in the Asian population. This case report presents a clinically well-known, but rarely encountered pathology.

Case report description. An 80-year-old female was admitted to Pauls Stradiņš Clinical University Hospital Emergency department with complaints about sudden intense pain behind sternum, irradiating to back, as well as shortness of breath and blood spitting. The patient was in poor overall condition and her blood pressure was 180/100 mmHg. In ED emergency esophagogastroduodenoscopy was performed, which showed extramural esophageal compression and mucous defect, pointing to the potential bleeding site. Chest x-ray showed decreased size of the left lung and elongated, bulging thoracic aorta with multiple aneurisms and calcined wall. Chest computed tomography with contrast showed substance in esophagus lumen with the same density as blood and possible communication between esophagus and the aortic aneurism.

The patient was transferred to the Thoracic Surgery centre where symptomatic therapy was initiated: morphine due to persisting pain; antihypertensive drugs to maintain systolic blood pressure under 130 mmHg. After four days in the hospital patient's temperature increased to 38.5 °C and antibiotic prophylaxis with piperacillin/tazobactam was started.

Complaints about difficulty swallowing, shortness of breath and blood spitting remained and a multidisciplinary meeting of doctors was summoned. It was decided that a radical surgical treatment was not possible and endoscopic procedures were with high risk, so surgical gastrostomy and further symptomatic treatment was accepted. After surgical gastrostomy the patient felt better, blood spitting did not recur. The patient continued outpatient treatment, following the given recommendations.

Conclusions. Dysphagia aortica is rarely considered as a differential diagnosis of dysphagia. There are treatment options for patients with AEF, but usually radical therapy is not possible due great patient age, poor overall condition and coexisting comorbidities.

Summary. This case report presents an 80-year-old woman with complaints about sudden intense pain behind sternum, irradiating to back, shortness of breath and blood spitting. After examinations rare diagnosis of AEF was made and successfully managed by surgical gastrostomy.
MYOCARDIAL INFARCTION AS A COMPLICATION OF MEDIASTINAL BRONCHOGENIC CYST

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Keywords. Bronchogenic cyst, mediastinal mass, mediastinal complications.

Introduction. Bronchogenic cyst is a relatively rare cause of mediastinal mass and majority of them are reported to be asymptomatic and found incidentally. However, even in symptomatic cases it might be a diagnostic challenge, because clinical presentation is usually nonspecific. We are reporting a case of bronchogenic cyst which manifested one of the rarest complications – myocardial infarction.

Case report. A 27-year-old male presented with complaints of a dull chest pain, cough, fever and malaise, lasting around one week. Computed Tomography (CT) angiography was made and soft-tissue masses with no contrast enhancement in mediastinum with a suspicion of lymphoma were identified. In addition, there was an external pressure visible in the bifurcation area while performing fibrobronchoscopy. Thus, Video-assisted Thoracoscopic Surgery (VATS) – open thoracotomy was performed with findings of purulent substance by the bifurcation. After the surgery reduction of the fluid and masses, the clinical state of the patient was improving and the patient was discharged after 11 days. 7 months later the patient presented again with the same symptoms as the first time. Acute lateral-frontal myocardial infarction was identified in ECG. In CT Scan of the chest cystic formation in mediastinum was found. Coronography was performed and a massive clot in the left coronary artery was detected. As a consequence, percutaneous coronary intervention was performed and stent was implanted. The coronary blood flow was restored and the symptoms of the patient regressed. Transesophageal echocardiography also confirmed a cystic formation, compressing the chambers of the heart and the trunk of left coronary artery. In 10 days rethoracotomy was performed. The cyst was removed and the patient had no complications after the surgery. The final pathologic diagnosis of bronchogenic cyst was confirmed.

Conclusion. The bronchogenic cysts are mostly asymptomatic, thus it is poorly diagnosed. However, it is usually located in mediastinum and it may produce symptoms of pressure to the surrounding structures. The radiological findings can also be misleading, because the CT appearance of the fluid can vary from density of water to higher density. Surgical treatment is recommended even for asymptomatic cysts in order to prevent complications.

Summary. We present a case of a bronchogenic cyst which manifested myocardial infarction because of the compression of the left atrium of the heart. Due to the surgical removal of the cyst and percutaneous coronary intervention performed on time, the clinical state of the patient improved rapidly.
COMPLICATED LEAD-RELATED ENDOCARDITIS IN A YOUNG PATIENT REQUIRING LEADLESS PACEMAKER IMPLANTATION

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Keywords. Endocarditis, leadless, MICRA, ventricular septal defect, cardiac surgery.

Introduction. Pacemakers (PM) extend survival and improve quality of life, but they can also cause life-threatening complications. The reported lead-related endocarditis incidence varies in 0.13 to 7%, and venous thrombosis up to 50% of patients, and may remain asymptomatic as venous collaterals develops.

Case report description. 26-year-old female patient was admitted to the department of cardiology with fever and right-sided pulmonary infarction of the upper lobe. In the laboratory examination raised level of inflammatory markers were discovered, and bacterial culture results from both hands showed Staphylococcus epidermidis bacteraemia.

A transoesophageal echocardiogram showed moving structures around electrodes in the right side of the heart (10 × 11 mm). A computed tomography showed superior vena cava (SVC) occlusion, thrombotic masses in the right atrium around electrodes.

Patient’s past history included total heart block after surgical closure of ventricular septal defect (VSD) at age of 2, following with myocardial PM implantation and multiple transvenous PM system replacements. History of recent hospitalisations for pulmonary infarction and pneumonia.

Redo median sternotomy with cardiopulmonary bypass was preformed, PM leads and vegetations were removed and partial recanalization of SVC was achieved. Tricuspid valve was replaced with bioprosthesis. A new epimyocardial PM electrodes were implanted with PM pocket in contralateral side.

At the 6th postoperative day patient developed surgical site infection and PM pocket infection, laboratory analysis showed negative dynamics. Therapy with VAC system was initiated.

In the hybrid operating room, leadless PM was implanted percutaneously via transvenous approach, into the right ventricle, following with removal of myocardial PM and VAC system, reosteosynthesis of sternum was performed.

On the 13th postoperative day patient was discharged home in a satisfactory state.

Conclusion. Lead-related endocarditis is a rare complication with high mortality rate. To reduce risk of re-infection by repeated implantation of transvenous leads, there is a possibility to use leadless single-component intracardiac device. This is the first described case of a leadless transcatheter pacing system use in Latvia.

Summary. This case report demonstrates young patient with pacemaker dependency as a result of total heart block after surgical VSD closure in childhood. After multiple PM system changes patient developed lead-related endocarditis and SVC occlusion and was managed with cardiac surgery and leadless PM system implantation.
PATIENT WITH KLIPPEL–TRÉNAUNAY SYNDROME PRESENTING WITH SEVERE ANAEMIA

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Keywords. Klippel–Trénaunay syndrome, anaemia, limb hypertrophy, depression

Introduction. Klippel–Trénaunay syndrome (KTS) is a rare congenital disease that manifests with varicous veins, limb hypertrophy and vascular malformations (port-wine stains). In KTS treatment should be conservative with multidisciplinary approach.

Case report description. A 43-year-old woman was hospitalised in Clinical Hospital Rijeka, Croatia due to family doctor’s referral after diagnosing severe microcytic hypochromic anaemia (haemoglobin level was 3.5 g/dl). In hospital patient immediately received 4 erythrocyte mass transfusions after which haemoglobin level increased to 5.8 g/dl.

During first visit patient complained about weakness and loss of power. Patient had haemorrhoids and fresh blood in her stool. She noticed rapid weight loss (around 40 kg), bad oral health and hair loss that all started around 2 years ago. She also had amenorrhea for the last year. Objectively patient looked weak and pale. She looked cachectic however her both legs were swollen and increased in size. She had several port-wine stains on her right thigh.

At birth patient was diagnosed with Klippel–Trénaunay syndrome that was never treated, however her condition did not cause daily life restrictions since she was able to work and do mild sports. She admitted she has developed depression more than 10 years ago because of her physique due to disease that led her to opiate abuse for several years. For the last 23 years she has smoked 1 package of cigarettes a day.

The only medication patient used was alprazolam 0.5 mg/day and buprenorphine 6 mg/day due to her previous opiate abuse (prescribed by psychiatrist).

During next 2 days patient received 4 more erythrocyte masses. She was admitted for further investigations but she refused the treatment and after 3 days left hospital. After last transfusion her haemoglobin level was 10 g/dl.

Conclusion. This case report presents a patient with rare syndrome that is not common in this hospital. In this case untreated KTS lead to severe anaemia because of bleeding haemorrhoids and depression because patient was not pleased with her physical appearance.

Summary. To avoid complications patients with KTS should receive lifetime therapy. Our patient should have continued treatment with nutritional support containing iron, haemorrhoid treatment and should be referred to psychiatrist because of her depression. Laser therapy for patient’s port-wine stains and compression stockings could improve her visual appearance which might reduce her depression.
A MALT LYMPHOMA SIMULATING CROHN’S DISEASE: 
CASE REPORT

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Keywords. MALT, lymphoma, IBD.

Introduction. MALT lymphoma, can be clinically confused with inflammatory bowel disease. Both of them can cause similar gastrointestinal symptoms, although they require specific treatment and provide different prognosis to the patient.

Case report. A 50-year-old man with a diagnosis of small intestine Crohn’s disease and receiving azathioprine was presented at our hospital with recurrent episodes of malaise and melena (4 in total). He had reportedly lost 6 kg of weight during that time. Upon physical examination no abnormal findings were found. Upper gastrointestinal endoscopy revealed ulceration in antral part of stomach, which was proven by histopathology. Enteroscopy of the small bowel demonstrated an 1.5 cm jejunum ulcer. Microscopically, biopsies showed lymphoplasmacytic infiltrate, a good clinical response was achieved and patient had only one episode of melena in following 2 years of treatment. 2 years later he relapsed and was hospitalised again. Laboratory testing indicated anemia- hemoglobin 98 g/l. Gastroduodenoscopy revealed atrophic mucosal tissue interposed between normal appearing mucosa on the posterior wall of the stomach. Biopsy samples were acquired. Small bowel MRI enterography revealed local circumferential infiltration of proximal part of the ileum. However, with clinical information, making the diagnosis of MALT lymphoma was hesitated. With the clinical picture and radiology findings, still not knowing results of biopsy, there was decided to increase azathioprine dosage from 100 mg to 150 mg per day and discharge patient from the hospital. A month after, results of endoscopic biopsies derived from proximal wall of stomach revealed H.pylori negative MALT lymphoma of gastric fundus. The patient failed to get any treatment due to MALT lymphoma diagnosis at this time. After one year he was hospitalised with nausea, vomiting and severe pain in upper part of the abdomen. CT scan showed ileus of small intestine and extraluminal air within the peritoneal cavity which led to gastrointestinal perforation diagnosis. The patient was scheduled for laparotomy. Histology of the postoperative jejunum disclosed jejunal MALT lymphoma, same imununophenotype as the gastric. Four months later, according to the pathological findings, the patient was treated with course of R-CHOP chemotherapy. Complete remission was observed following 6 cycles of treatment, as visualized by CT scan.

Conclusion. MALT lymphoma’s histopathology and symptoms can mimic Crohn’s disease. In this case, only MRI revealed diagnosis of MALT lymphoma.

Summary. This case report highlights the clinical relevance of knowledge and awareness of MALT lymphoma simulating Crohn’s disease.
GASTRIC GASTROINTESTINAL STROMAL TUMOUR CD117-NEGATIVE

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Keywords. Gastrointestinal stromal tumour, PDGFA-mutation, CD117.

Introduction. Stromal tumours originating from stem cells and Cajal starter cells. They constitute 0.1–3% gastrointestinal tract tumours. As primary tumours, they can occur throughout the entire gastrointestinal tract. They occur especially in 5th decade of life, rarely in children. At the time of diagnosis, they can form multiple metastatic focal points, mostly located in the abdominal wall, retroperitoneal space or liver.

Case report. 70-year-old patient reported to the hospital with gastric bleeding. The doctors performed endoscopic diagnostics (gastroscopy, colonoscopy), radiological imaging examinations, abdominal ultrasonography, abdominal CT. Endoscopic diagnostic – gastroscopy revealed gastrointestinal ulceration, the histopathological sections diagnosis was GIST, CD117 negative. CT examination of the abdominal cavity showed existence of 4 metastatic tumours within the liver. The doctors applied surgical treatment which was partial resection of the stomach. Histopathological and immunohistochemical studies shown lack of CD117, SMA, S100 expression. Focal expression of CD34, HMB45. The tumour measure 5 × 3, 5 × 2,5. Mitotic index at the level of 10/50 high-power field. Molecular studies demonstrated the presence of PDGFA mutations.

Conclusion. Only molecular tests allowed to make a decision about the diagnosis and treatment because of the fact that patient belongs to the narrow group of cases in which is indicated to follow a different treatment than in CD117-positive GIST.

Summary. In 80–90% of GIST, the over expression of the CD117 antigen (mutation of the KIT proto-oncogene) is observed. 80% of CD117 negative GISTs have a mutation in the PDGFRA gene (platelet-derived growth factor receptor alpha). In 10–20% CD117 negative GISTs the expression of KIT and PDGFRA- wild-type mutations are not found.
MAPLE SYRUP URINE DISEASE: A CASE REPORT

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Keywords. Maple syrup urine disease, inborn error of metabolism, neonate.

Introduction. Maple Syrup Urine Disease (MSUD) is a rare inherited disorder affecting the breakdown of branched chain amino acids (BCAAs) – leucine, isoleucine and valine. That causes the accumulation of ketoacids which results in oxidation of metabolites with a characteristic odor. Leucine and its ketoacids have neurotoxic effect. If not diagnosed or not treated properly that can cause lethal brain swelling. The aim of this case report was to report the rare inborn error of metabolism, its manifestation and underline the significance of appropriate treatment.

Case report description. A 7 day age female newborn arrived to the emergency department due to the lethargy and progressing reduction of oral intake. There was observed the tonic posturing, distonic movements and cerebral encephalopathy signs. Routine laboratory investigations had shown hipoglycemia and decompensated metabolic acidosis. Serum lactate level was normal. Neurosonography showed hyperechogenicity of periventricular white matter and subcortical nuclei. Also, the consulting geneticist revealed the maple syrup odor in the urine. The elevated plasma concentrations of BCAAs: leucine 1817 µmol/l, isoleucine 532 µmol/l, valine 973 µmol/l confirmed the diagnosis of maple syrup urine disease. The patient was treated with intravenous fluid and glucose therapy, thiamine and the elimination of BCAAs from the diet: breast feeding replacement with BCAAs-free medical formula. However, there was no clinical improvement; the BCAAs concentrations remained extremely high so there was decided to start the peritoneal dialysis (PD). After the 9 days the PD was stopped due to the insufficient results. There was observed the hypotonic posture, absence of neonatal reflexes and the increase in BCAAs levels. Consequently, the continuous venovenous hemofiltration (CVVH) with CARPEDIEM machine was introduced. After the 3 days of CVVH there was achieved the targeted levels of BCAAs (leucine 38 µmol/l) and positive dynamic of general condition. The condition of the last day in-hospital treatment: normal muscle tonus, positive neonatal reflexes, no stereotypical movements, BCAAs in normal ranges, though absence of head circumference growth.

Conclusion. The accumulation of BCAAs in the brain causes the encephalopathy and progressive neurodegeneration. As a consequence, the early diagnosis and effective treatment is very important. As such as the neonatal screening that is performed in some countries.

Summary. In this case we presented the essential diagnostical features of MSUD and the challenging issues of treatment of this disease. This case underlines the need of awareness of the suspicion and appropriate treatment of inborn errors of metabolism.
PSYCHOGENIC POLYDIPSIA WITH DILUTATIONAL HYponATREMIA

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Keywords. Psychogenic polydipsia, dilutional hyponatremia.

Introduction. Primary polydipsia is caused by psychiatric disorders, and often is accompanied by sensation of dry mouth. Since primary polydipsia is a diagnosis of exclusion, other causes, like diabetes insipidus must be excluded first. The illness generally develops in three phases, beginning with polydipsia and polyuria, followed by hyponatremia due to excessive drinking and finally water intoxication which may manifest as nausea, vomiting, delirium, ataxia, seizures, and coma, and may even be fatal.

Case report. We describe a case of a 31 year old woman with paranoid schizophrenia that has resulted in psychogenic polydipsia with dilutional hyponatremia. 15 years ago she had anorexia nervosa; body weight for a long time was 30 kg (BMI 12 kg/m²). Progressive dysphagia with stomach pain, constipation resulted with fear of eating. Since 2014 patient experiences dry mouth. Excessive water consumption caused dilutional hyponatremia. The water deprivation test excluded diabetes insipidus. Long term malnutrition caused osteoporosis. As a result, multiple traumatic fractures of pelvis accrued in 2015. In May 2016 patient presented to the hospital with seizure. Laboratory findings showed Na+ 120.95 mmol/l (N 136–145 mmol/l). After substitutional therapy, patient’s condition improved. Patient admitted drinking around 6 liters of water per day. Patient regularly takes psychiatrist prescribed medication – Fluoxetine, Quetiapin, Alpralozam, Olanzapine. In 10 months patient admitted with fatigue, cold arms and legs. Patient’s weight was 40kg (BMI 17.3 kg/m²). She was drinking around 25 liters of water per day. Na+ 111 mmol/l (N 136–145 mmol/l). Psychiatrist recommended limiting water consumption. Patient did that after discharge, but next day was admitted with another seizure, since sodium rose rapidly from 111 to 134.8 mmol/l (N 136–145 mmol/l). After discharge she had two more episodes of seizures and hospital admissions. Withholding from excessive drinking allows sodium levels to rise from 128 up to 136.76 mmol/l in control tests.

Conclusion. Balance between antipsychotic medication for psychogenic polydipsia treatment and medication induced hyponatraemia is complex. On one hand medication can reduce polydipsia, but on the other it can promote it. Hypotheses include stimulation of thirst centers by elevated dopamine levels, drinking to counteract anticholinergic side effects of psychotropic medications, and changes in feedback regulation of the hypothalamic-pituitary axis induced by chronic polydipsia.

Summary. A 31 year old woman with psychogenic polydipsia presented with dilutional hyponatremia and subsequent seizure episodes over past two years.

Withholding from excessive drinking improves overall sodium levels.
AN INSPIRATIONAL CASE REPORT OF FITNESS
AND HEALTH TEAMS VICTORY OVER
METABOLIC SYNDROME

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Keywords. Metabolic syndrome, fitness, diet and lifestyle changes over medicamentous treatment.

Background. Nowadays the prevalence of obesity greatly increases, as does the potential to develop Metabolic Syndrome (MS). MS is a condition that represents a multiplex of risk factors such as: insulin resistance, obesity, metabolic changes in blood tests and multiple organ dysfunction and psychological pressure. People with MS are more likely to develop chronic health conditions, including cardiovascular disease and diabetes. Between 2013 and 2014, prevalence of obesity (BMI 30.0–39.9 kg/m²) in people 20 years of age and older was 37.7 %, but the incidence of morbid obesity (BMI ≥40 kg/m²) was 7.7 % in the same age category.

Case report. In August 2016 a 22 year old woman with morbid obesity was diagnosed with MS and type 2 diabetes. She had 4 of 5 MS criteria:
1) Fasting blood glucose – 7.40 mmol/l;
2) Hypertension treated since the age of 15;
3) HDL- cholesterol was 1.16 mmol/l;
4) Abdominal obesity, waist circumference – 110 cm.
She had high motivation to improve her medical condition, quality of life and reduce psychological distress. A consulting team of an endocrinologist, a sports doctor, the fitness enthusiast from Endivity Training and a physiotherapist worked to create a medical treatment and training program. In the time period of 1 year, she lost 38.5% of her body mass, which was achieved by supervised physical activities, balanced diet and restricted number of calories a day. She was ensured with plenty of time to relax her mind and body (allowing her muscles to recover). She participated in manual therapy suggested by the sports doctor and underwent a treatment encouraged by her endocrinologist. After 3 months of training her blood pressure normalized and she stopped medication. Treatment with metformin 1500 mg daily was continued. Comparing MS criteria’s analysis after one year (August, 2017), we see that:
1) Fasting blood glucose is 4.80 mmol/l;
2) Blood pressure is 130/80 mmHg;
3) HDL- cholesterol is 1.28 mmol/l;
4) Waist circumference is 84 cm.
Triglycerides, which is the 5th MS criterion, was normal before and after treatment.

Conclusion. High motivation of patient and teamwork allow her to achieve very good results. She is still continuing to observe healthy life style principles and will be happy to share her experience with others. This case is a good example of how graduate weight loss can resolve medical problems.

Summary. Life style changes can make a powerful impact on metabolic syndrome treatment, and it needs to be observed in any patient.
CASE REPORT: PATIENT WITH 50 YEAR HISTORY OF PHANTOM PAIN

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Keywords. Phantom limb sensation, phantom pain, neuropathic pain, traumatic lower limb amputation.

Introduction. Phantom pain pathogenesis and therapeutic principles have been actively studied in recent years to provide the patient with satisfactory quality of life and painless daily activities after limb amputation. Several factors have been proven to contribute to onset of phantom sensation and phantom pain, such as amputation mechanism, patients age at the time of amputation, pharmacological therapy and the use of prosthesis. All of the aforementioned factors were evaluated in order to assess the cause for prolonged pain.

Case report description. Patient, female, 64 years old. At the age of 15 in 1968 she suffered a traumatic lower limb amputation below the knee. Phantom pain appeared immediately after and was not manageable with medication. The wound closure required a skin graft transplantation. In the same year patient recived prosthesis, but underwent reamputation a year later at the level of knee joint (Gritti-Stokes amputation), because usage of the prosthesis was limited. Although new prosthesis was made, the phantom pain persisted and new pain sensations appeared in amputation stump. Patient described these sensations as sharp with sudden sense of electricity going through the limb, scoring these pains with a score of ten from possible ten on the Pain scale. At the moment – 50 years later – patient still suffers from neuropathic pain in accordance with PainDetect questionnaire. Phantom pain has become more tolerable, but phantom sensation is still present. Patient has been prescribed Pregabalin, but she prefers Ibuprofen for pain relief, as Pregabalin induced drowsiness interferes with her work.

Conclusion. Phantom sensation can persist for more than 50 years after amputation. Patients risk factors for phantom pain include amputation at young age, traumatic amputation mechanism and lack of acute pain management after amputation. Prosthesis usage was not effective as a pain management method. Ibuprofen is not effective for treatment of neuropathic pain, and patients therapy should include anticonvulsants, tricyclic antidepressants, NMDA receptor antagonists. Effective collaboration between patient and doctor could improve the success of pain management.

Summary. Patient had a traumatic amputation in 1968 at the age of 15, after the incident phantom pain was diagnosed. Pain has persisted for 50 years, and patient still suffers pain attacks with pain between them, describing pain intensity as worst possible. Mismanaged therapy could be accounted for recurring pain.
ALCOHOL WITHDRAWAL SYNDROME RELATED SUDDEN DEATH

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Keywords. Chronic alcohol abuse, alcohol withdrawal syndrome, sudden cardiac arrest, cardiopulmonary resuscitation.

Introduction. Alcoholism remains a serious issue in the aspect of health care as chronic alcohol abuse frequently results in polymorbid states which are often irreversible, distorting and even fatal.

Case report description. A 49-year-old male seeks emergency medical assistance due to feeling fatigued and anxious; he also complains of heart palpitations for the last 2 weeks and claims he had experienced 3 episodes of unconsciousness the day before. The patient has been consuming alcohol for 2 months with short periods of abstention. He has a known diagnosed of toxic dilatation cardiomyopathy (CMP). Examination reveals arterial blood pressure 155/76 mmHg, sinus tachycardia 101 ×/min and ethanol 1.6 %.

The patient is taken to the Riga East University Hospital clinical center “Gaiļezers” Clinic of Emergency Medicine where further investigations are done. Laboratory findings - lactate 10.05 mmol/l, glucose 14.32 mmol/l, potassium 5.86 mmol/l. Electrocardiogram shows sinus tachycardia, incomplete right bundle branch block and non-specific ST-wave changes. Computed tomography for the head visualizes air emboli in the sagittal sinus.

A diagnosis is established: electrolyte disorder, metabolic lactate acidosis and toxic dilatation CMP. The patient is admitted to the Toxicology center where therapy with Sol. NaCl 0.9 %, B vitamins, diazepam, clonidine, antipsychotics and omeprazole is prescribed. An afterwards done laboratory analysis shows a D-dimer level of 18.1 µg/ml and a CT pulmonary angiography is planned.

The next morning the patient experiences an episode of sudden cardiac arrest and cardiopulmonary resuscitation is immediately initiated. 40 minutes later asystole occurs and biologic death is stated. Later that day the patient’s wife declines an autopsy in writing.

Conclusion. The complicated clinical findings were most likely ethanol abuse related and mutually stimulating but the reason of sudden cardiac arrest in the given patient will remain unknown. Various possible reasons of why the patient died include massive pulmonary embolism, catheter related venous air embolism, severe uncorrected hyperkalemia, lactic acidosis and other. An autopsy would have served as a learning experience.

Summary. Alcohol abuse related health issues and alcohol withdrawal syndrome may result in life threatening cardiac events if not promptly and correctly treated.
VII SURGERY, ONCOLOGY

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IMMUNOHISTOCHEMICAL ASSESSMENT OF CARCINOEMBRYONIC-RELATED CELL ADHESION MOLECULE 6 EXPRESSION IN PANCREATIC INTRAEPITHELIAL NEOPLASIA

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Keywords. PanIN, CEACAM-6, immunohistochemistry.

Introduction. Carcinoembryonic-related cell adhesion molecule 6 (CEACAM-6) is a glycosylphosphatidylinositol (GPI) - linked member of the immunoglobulin superfamily. It is calcium-independent adhesion protein and it exhibit homo- and heterotypic cellular interactions. CEACAM-6 is overexpressed in many gastrointestinal epithelial tumours. It also may play role in regulation of cell adhesion, tumour progression and angiogenesis.

Aim. The aim of study was to evaluate and to compare the expression of CEACAM6 protein in normal pancreatic ducts and in the most common precursor lesions of pancreatic ductal adenocarcinoma (PDAC) – in pancreatic intraepithelial neoplasia (PanIN) coexisting with pancreatitis and PDAC.

Materials and methods. The study group consisted of 70 patients treated for chronic pancreatitis and pancreatic ductal adenocarcinoma, who also had pancreatic intraepithelial neoplasia. The expression of CEACAM-6 was performed by immunohistochemical method and evaluated using 3-point scale: 0 – lack of positive reaction in pancreatic intraepithelial lesions, 1 (weak and moderate) – reaction present in 1–30 % epithelial cells in PanIN, 2 (strong) – reaction present in > 30 % epithelial cells in PanIN. We used STATISTICA v13.1 Software (Statsoft, Cracow, Poland) for statistical analysis. The data were analyzed using Spearman’s rank correlation test. Correlations between CEACAM-6 expression depending on PanIN stage were examined by Mann–Whitney’s test.

Results. Statistical analysis revealed positive correlation between CEACAM-6 expression with PanIN (cytoplasmic and membranous reaction, p < 0.0001). Expression of this protein increased with stage of PanIN advancement. In addition, we observed statistically significant relationship between CEACAM-6 expression and diagnosis. Higher cytoplasmic reaction and lack or weak membranous reaction were more often seen in patients suffered from pancreatic ductal adenocarcinoma (p = 0.01). By contrast, higher membranous reaction was more frequently observed in patients with chronic pancreatitis (p < 0.001). Moreover, we noticed that cytoplasmic reaction (p = 0.012) and membranous reaction (p = 0.041) were demonstrated more often in female group.

Conclusion. Expression of CEACAM-6 appears to make an important role during progression of PanIN lesions to invasive pancreatic cancer. Moreover, CEACAM6 may be a useful biomarker which could be used to diagnose precancerous lesions in pancreas.
SIGNIFICANCE OF FASCIN–1 AND ACTININ–4 EXPRESSION IN PANCREATIC INTRAEPITHELIAL NEOPLASIA DEVELOPMENT

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Keywords. Panin, fascin-1, actinin-4.

Introduction. Fascin-1 and actinin-4 are involved in key process of tumour cells adhesion, migration and metastasis. Actinin-4 plays an important role in promotion of cell proliferation by enhancing the target gene expression and accelerates the cytoskeleton reorganization facilitating the cell migration. Fascin-1 regulates cell motility by maintaining the integrity of actin–rich cell structures. Its overexpression leads to loss of cell adhesion and metastasis.

Aim. The aim of study was immunohistochemical assessment of fascin-1 and actinin-4 expression in normal pancreatic ducts and in pancreatic intraepithelial neoplasia (PanIN) – precursor lesion of pancreatic ductal adenocarcinoma (PDAC).

Materials and methods. The study involved 70 patients treated surgically due to PDAC, cysts and pancreatitis, who also had pancreatic intraepithelial neoplasia. Fascin-1 and actinin-4 expression were evaluated using immunohistochemistry. Expression of actinin-4 was observed along the luminal cell border and in the cytoplasm whereas expression of fascin-1 was found in the cytoplasm of pancreatic ductal epithelial cells. The results of the staining were quantitatively assessed for the percentage of the positively stained cells. STATISTICA 13.1 (Statsoft, Poland) was used for statistical analysis. The data were analyzed using Spearman's rank correlation coefficient and Mann–Whitney's test.

Results. A statistically significant relationship was observed between expression of fascin-1 as well actinin-4 (cytoplasmic) and patient’s age (p = 0.01, p = 0.002, respectively). Higher fascin-1 and actinin-4 expressions were shown in group over 60 years old. Expression of fascin-1 and actinin-4 was associated with diagnosis (p < 0.001, p = 0.04, respectively). Higher expression of these proteins was seen in PanINs accompanied by PDAC than in cases of pancreatitis and pancreatic cysts. Statistical analysis revealed correlations of the fascin-1 and actinin-4 expression with the presence and grade of PanIN (p < 0.001, p = 0.002, respectively). Expression of these proteins was observed in each stage of PanIN and increased with the pancreatic intraepithelial neoplasia progression.

Conclusion. Fascin-1 and actinin-4 expression is associated with the stage of PanIN advancement and depends on the type of primary disease. Overexpression of these proteins may be involved in the oncogenic pathway by disrupting cell–cell adhesion. Elevated expression of fascin-1 and actinin-4 indicates the role in the progression from PanIN to PDAC.
FIRST RESULTS OF GASTROENTEROPANCREATIC NEUROENDOCRINE TUMOUR (GEP-NET) MULTI-INSTITUTIONAL REGISTRY

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Keywords. Neuroendocrine tumours, multi-institutional registry, statistics.

Introduction. GEP-NETs are a heterogeneous group of neoplasms that arise throughout the gastrointestinal system. Although recent epidemiological studies show an annually increasing incidence of the disease, data on GEP-NETs is difficult to obtain and is mainly based on national cancer registries. A national Latvian registry of GEP-NETs was launched by the cooperation of two University Hospitals and the first results are reflected in the study.

Aim. To gather patients with GEP-NETs in a multi-institutional registry and analyze the obtained data. To update statistics and continue researching GEP-NETs.

Materials and methods. One hundred seventy-two cases of histopathologically confirmed GEP-NETs treated at two University Hospitals between 2006 and 2016 were gathered by retrospective and prospective analysis of patient files, registered in EUROCRINE and included in the study. Clinicopathological characteristics, surgical variables and immunohistochemistry were analyzed.

Results. Male to female ratio was 1:2.3 (n = 52:120) with the median age of 60 (interquartile range 52–70) years. The most frequent primary site was the pancreas (n = 50; 29.1 %), followed by stomach (n = 46; 26.7 %), small intestine (n = 35; 20.3 %), appendix (n = 12; 7.0 %), rectum (n = 8; 4.7 %), colon (n = 8; 4.7 %), caecum (n = 6; 3.5 %), sigmoid colon (n = 4; 2.3 %) and carcinoma of unknown primary site (n = 3; 1.7 %). In 84.3 % of the cases (n = 145) tumours were hormonally non-functional. Advanced disease at time of diagnosis was detected in 29.7 % (n = 51) of cases, however, PET-CT was not used until 2016. 80.2 % of patients (n = 138) underwent an operation with curative or palliative intent. Postoperative staging determined that most tumours were stage I (29.1 %; n = 50). According to Ki-67 distribution, G1 (36.6 %; n = 63) tumours were predominant. Chemotherapy was administered in 13.4 % (n = 23) of patients, and biological targeted therapy was administered in 8.1 % (n = 14) of patients between 2015 and 2016. At the time of the analysis 42 deaths were documented, corresponding to 24.4 % of the registry population.

Conclusion. Collection and critical analysis of GEP-NET data in accordance to European levels can serve as a solid background for improving surgical and non-surgical treatment thus influencing long term results in the future.
ANTI-TUMOUR EFFECT OF ONCOLYTIC SINDBIS VIRUS
VECTORS IN MOUSE BREAST CANCER MODEL

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Keywords. Alphavirus, Sindbis Virus, cancer gene therapy.

Introduction. Sindbis virus is enveloped RNA virus which belongs to Alphavirus genus. Alphavirus based vectors are potential candidates for cancer gene therapy. The advantages of alphaviral vectors, including high transgene expression level, absence of pre-existing immunity, low immunogenicity of the vector itself and other features over the traditional gene therapy vectors, make them a very attractive model for gene therapy targeting tumour microenvironment.

Aim. In this study we investigated the ability of recombinant oncolytic alphaviral vectors based on Sindbis virus replicon to inhibit tumour growth in mouse TS/A breast cancer model.

Materials and methods. Sindbis (SIN) based vectors were designed to express mouse Chitinase like protein (CLP) gene, as a potential anti-tumour cytokine able to activate tumour-associated macrophages (TAMs) and polarize them into tumoricidal M1 phenotype. Sindbis virus vector expressing Green fluorescent protein (GFP) was used as a control. Viruses were produced in Baby hamster kidney cells (BHK-21) under optimized conditions and purified using ion exchange chromatography. In vitro tests – Western Blot (WB) and immunostaining (IS) assay were applied to detect transgene expression and to quantify virus titres. Viruses were injected intatumorally in mouse TS/A tumours (n = 6–7), injections of Phosphate buffer saline (PBS) were used as a negative control. Totally five virus injections were made within 22 days. The volume and the weight of tumours were analyzed and compared to the negative control. TAMs were analyzed in cryosection using anti CD-68 immunohistochemistry.

Results. In vitro cell infection tests showed high level of CLP protein production in cell cultures. Anti-CLP immunostaining revealed cytoplasmic localization of CLP in the cell. In vivo studies in mouse TS/A model showed statistically significant inhibition of tumour growth upon intratumoral administration of both Sin/CLP and Sin/GFP vectors (p < 0.05) comparing to PBS control. Although both vectors (Sin/CLP and Sin/GFP) led to tumour growth inhibition, we did not observe significant enhancement of antitumoral effects by CLP expression in mouse model. Nevertheless, analysis tumour cryosections showed that intratumoral expression of CLP promotes TAM infiltration into the tumour and their polarization to tumoricidal M1 phenotype.

Conclusion. In this study we showed that intratumoral administration of alphaviral vectors inhibits tumour growth in TS/A breast cancer model. Furthermore, alphaviral vectors can be used for transient expression of cytokines for modification of tumour microenvironment.
CD44 MARKER EXPRESSION IN COLORECTAL CARCINOMA

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Keywords. CD44, colorectal carcinoma.

Introduction. Studies suggest that the concept of cancer stem cells (CSCs) is essential in the process of oncogenesis. The expression of glycoprotein marker CD44 is currently used to detect these CSCs in colorectal carcinoma (CRC). Recent research marks CD44 role in aggressive cancer growth, tumour cell proliferation and metastatic spread. Identifying CD44 as target for antibodies has shown promising results in the reduction of malignant activity in a neoplasm.

Aim. Evaluation of CD44 marker expression in different CRC areas and its relation to different tumour parameters.

Materials and methods. The retrospective study included 40 CRC cases, stained with CSC marker CD44. The tumour type and spread (pTN) was assessed by WHO classification. Invasion into lymphatic vessels and nerve structures were noted. CD44 marker expression in CRC in main tumour mass (MTM) and invasion site (IS) was qualitatively evaluated in 5 vision fields. Expression was characterized by relative extent (RE), % and intensity I in a 0–3 scale (0: absent, 1: weak, 2: moderate, 3: strong) as the sum of RExI. Obtained data were analyzed using IBM SPSS 25.0. Descriptive statistical methods were used. Results were considered statistical significant, if p < 0.05.

Results. Study included 40 cases of CRC and main part of cases were pT3 and pT4 CRC. Metastasis in lymph nodes (pN+) were present in 42.5 % (95 % CI: 28.5 – 57.8) of cases. Overall, invasion into lymph vessels were found in 35.0 % (22.1–50.5), perineural invasion in 27.5 % (16.1 – 42.8) of cases. Sample analysis revealed a mean CD44 marker expression of 2.47 (2.30 – 2.55) in MTM and 1.93 (1.82 – 2.05) at IS. Positive correlation between MTM and IS was proved to be statistical significant (Spearman test (ρ) = 0.44, p = 0.04). Difference (Δ) in CD44 expression between MTM and IS displayed a mean of 0.54 (0.44–0.66). There was no statistically significant difference of mean Δ regarding pT (p = 0.07), pN (p = 0.37) and tumour grade (p = 0.69). 45 % (30–60) of cases showed at least one positive parameter for invasion. Mean Δ had statistically significant result comparing cases with lymph vessel invasion (p = 0.02), but there was no statistically significant difference regarding venous (p > 0.05), perineural (p > 0.05), intraneural (p > 0.05) invasions. CD44 high (> M = 2.47) and low (< M = 2.47) expression in MTM showed no statistically significant result regarding pTN and invasion into tissue structures (p > 0.05). However, high (> M = 1.93) and low (< M = 1.93) CD44 expression in IS showed statistically significant result regarding cases with at least one invasion and cases without any invasion (p = 0.03).

Conclusion. MTM showed significantly higher mean CD44 expression than the IS. CD44 might have a predictive role in tumour invasion and lymphatic spread of CRC. Potential therapeutic value needs to be evaluated in further research.
LYMPH NODE DISSECTION DURING TOTAL THYROIDECTOMY EFFECT ON TOTAL SERUM CALCIUM LEVEL AFTER SURGERY IN THYROID CANCER PATIENTS

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Keywords. Total thyroidectomy, thyroid cancer, total serum calcium, lymph node dissection.

Introduction. Total thyroidectomy is often necessary to treat thyroid cancer. Parathyroid glands are often affected during the operation, which may result in changes in serum calcium level in the postoperative period. Postoperative hypocalcemia can cause severe symptoms and increase hospitalization time. Local lymph node dissection during thyroidectomy is often necessary for therapeutic, prophylactic or diagnostic purposes.

Aim. The aim of this study was to find out if lymph node dissection (LND) during total thyroidectomy affects first postoperative day total serum calcium level (TSCaL).

Materials and methods. Retrospective study was carried out analyzing patient data who underwent total thyroidectomy from October 2015 till February 2017 and had histologically proved thyroid cancer. Data about preoperative and first postoperative day TSCaL was available for 74 patients. 20 (27.0%) from them underwent LND during thyroidectomy. IBM SPSS 22 software was used for descriptive statistics and T-test. Normal TSCaL was defined as 2.20–2.60 mmol/L, low TSCaL as 1.90–2.19 mmol/L and severe hypocalcemia as < 1.90 mmol/L.

Results. Of 74 patients 68 (91.9%) were female and 6 (8.1%) – male. Mean age was 55.7 ± 3.0 ranging from 23 to 81. Mean preoperative TSCaL was 2.32 ± 0.03 mmol/L, mean postoperative TSCaL was 2.02 ± 0.03 mmol/L. There was statistically significant difference between preoperative and postoperative TSCaL (−0.30 ± 0.04 mmol/L, p < 0.001). In first postoperative day 14 (18.9%) patients had severe hypocalcemia, 55 (74.3%) – low TSCaL and 5 (6.8%) – normal TSCaL. Mean first postoperative day TSCaL in group who underwent LND was 2.00 ± 0.06 mmol/L and 2.03 ± 0.03 mmol/L in group who didn’t, but no statistically significant difference between mean values was found (p = 0.427). There was no statistically significant difference in mean ∆TSCaL (preoperative – postoperative TSCaL) between those who had LND and those who did not (p = 0.728).

Conclusion. Mean total serum calcium level was lower after total thyroidectomy. Although there was difference in mean postoperative serum total calcium level in those who underwent lymph node dissection and those who did not, it was not statistically significant, so lymph node dissection during total thyroidectomy in thyroid cancer patients is not an additional risk factor for lower postoperative total serum calcium level.
HISTOLOGICALLY BENIGN BREAST LESIONS SURGICAL EXCISION REASONABleness FOR PATIENTS WITH PREVIOUS RADIOLOGICAL EXAMINATION AND CORE BIOPSY FINDINGS

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Keywords. Benign breast lesion, core biopsy, breast ultrasound, mammography.

Introduction. Benign breast lesions like simple cysts, fibroadenomas and intraductal papillomas are very common in women, and they are not life-threatening unlike breast cancers. Some of them may not cause any symptoms and may be found during a mammogram only, but sometimes they can cause symptoms that are like those from breast cancer. Therefore further investigations like breast ultrasound and core biopsy are required to decide are there indications for surgical operation or only further observation is needed.

Aim. Evaluate benign breast lesions excision reasonableness in patients with radiological examination and core biopsy findings.

Materials and methods. The target group for our research were patients (female gender only) with histologically confirmed benign breast lesion, who underwent its surgical excision from 01.07.2016. till 09.11.2017. Then the radiological examination (breast ultrasound or/and mammography) results and core biopsy results were searched. Only those patients who had both investigation results available, were included. Then radiological examination and core biopsy results were evaluated and categorized. Finally, reasonableness for surgical excision were analyzed based on „NHS Breast Screening Programme” Clinical guidance for breast cancer screening assessment, Fourth edition, November 2016.

Results. During the period from 01.07.2016. till 09.11.2017. 82 patients with histologically confirmed benign breast lesion underwent its surgical excision. 75 of them had both radiological examination (mammography and/or US) and core biopsy performed. Age range was 16–85 years (the mean age 42.4 years). The data showed that 13.33 % of surgical excision were done with clear indications. In 86.67 % of cases there were no indications for surgical excision based on the Clinical guidance for breast cancer screening assessment. And only 3.00 % (4 research participants) indication for surgical lesion excision was patient’s own wish.

Conclusion. From 75 patients who participated in our research 86.67 % had surgical excision operation, that was not necessary if we use “NHS Breast Screening Programme” Clinical guidance for breast cancer screening assessment, Fourth edition, November 2016 as our guidelines. It must be said, that some patients had other relative indications that was not mentioned in guidelines, but were significant for decision to have surgical excision like discharge from nipple, palpable masses or patients own wish to have this surgery.
LARGE AND INTRATHORACIC GOITERS:
A COMPARATIVE STUDY

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Keywords. Goiter, intrathoracic goiter, large goiter.

Introduction. Goiter is diffuse or nodular thyroid gland hypertrophy. Intrathoracic goiter is defined as goiter that either descends below the plane of the thoracic inlet or has more than 50% of its mass residing below the thoracic inlet. Management of large and intrathoracic goiters might be more challenging due to the size and location of the thyroid.

Aim. The aim of the study was to analyze the preoperative and postoperative characteristics of patients with large goiters and patients with intrathoracic goiters, and compare them with average and small goiters (< 100 g).

Materials and methods. A retrospective review of a surgical database Eurocrine was performed. We included patients with large thyroids (total excised thyroid mass > 100 g) and patients with intrathoracic goiters, regardless of the size, that were hospitalized for thyroidectomy from 2015 to 2017. Data was analyzed using Microsoft Excel and SPSS programs.

Results. Of the 420 patients, 74 (17.7%) patients had large (> 100 g) or intrathoracic goiter. Those patients were divided into subgroups: 45 (10.7%) patients with large goiters (total excised mass from 100 to 200 g), 17 (4.1%) patients with large goiters (total excised mass > 200 g) and 12 (2.9%) patients with intrathoracic goiters. The remaining 346 (82.3%) patients were classified as average size goiters. The mean excised thyroid mass in the first group was 136.26 g, in the second group – 292.76 g and in the third group – 198.22 g. The mean excised thyroid mass in the group of average size goiters was 36.32 g. The two main indications for operation in all three subgroups were a compression symptom and thyreotoxicosis. In the group of average size goiters the main indication was to exclude a malignancy (28.6%) followed by thyreotoxicosis (26.7%). The longest mean operation time was in a subgroup with goiter mass > 200 g (161 minutes), the shortest mean operation time was in a subgroup with average size goiters (121 minutes). The main histological diagnosis in all three subgroups was nodular goiter. There were two cases of left recurrent laryngeal nerve palsy after the surgery – one in the subgroup with patients with total excised goiter weight > 200 g, another in the group with average size goiters. The most patients with hypocalcaemia which required treatment with i/v or p/o calcium were in the group of average size goiters.

Conclusion. Patients with large and intrathoracic goiters require more operation time than average size goiters, although the size and location of the goiter does not have a major impact on surgical technique and postoperative complications.
CHARACTERISTICS OF TUMOR THICKNESS IN MELANOMA PATIENTS: SINGLE CENTER STUDY

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Keywords. Melanoma, Breslow, relapse free survival.

Introduction. The incidence of skin melanoma has increased from 6.9 in 2007 to 10.4 in 2014 per 100 000 inhabitants in Latvia (Health in the Baltic Countries report, 2014). The mean stage on which melanoma is diagnosed in Latvia is IIC, mean Breslow – 6 mm (Azarjana K. et al., 2012, Melanoma epidemiology, prognosis and trends in Latvia). It is known that early diagnosis of the disease can provide a better prognosis for cure and overall survival. However, it is seen that diagnosis of melanoma in Latvia is set late.

Aim. To characterize features of primary diagnosed skin melanoma and calculate relapse free survival according to the tumour stage. Data were compared with England, Bosnia and Hercogovina, Sweden.

Materials and methods. Medical records of 700 patients were analyzed, from whom 90 patients with primarily diagnosed melanoma, whose diagnosis was established during the January 2011 to December 2013 met inclusion criteria and were included in the retrospective study. All patients underwent surgery at Riga East University Hospital (REUH). Obtained data were analyzed using IBM SPSS program.

Results. From 90 patients 60 were women (67%) and 30 were men (33%). The average age was 40.62 years, mean Breslow thickness for all patients – 2.68 mm. Patients were divided into three groups according to the stage of the disease. Group 1 (IA, IB stages) included 53% of patients, whose average age was 40.05 years, average Breslow – 1.19 mm, median Clark level – II. Average relapse free period was 4.54 years. Progression of the disease occured in 16% of cases. Group 2 (IIA, IIB, IIC stages) included 37% of patients. Average age – 40.93 years, average Breslow was 3.86 mm, median Clark level – III. Average relapse free period – 4.24 years. 18% of patients had spread of the disease. Group 3 (IIIA, IIIB, IIIC) included 10% of patients. Average age – 43.9, average Breslow was 6.76 mm, median Clark level – IV, relapse free period – 3.3 years. Progression of the disease was observed in 50% of cases. According to the literature, the mean Breslow in England is 1.2 mm, Bosnia and Hercogovina – 4.6 mm, Sweden – 1.58 mm.

Conclusion. Only 53% of patients admitted at REUH were diagnosed at the stage I of the disease. The average Breslow thickness was higher in our study in comparison with data obtained from England and Sweden. Relapse free survival decreased in the patients with higher stage of the disease and those with thicker melanoma.
INCIDENCE OF PERMANENT PACEMAKER IMPLANTATION AFTER CARDIAC SURGERY: A SINGLE CENTER EXPERIENCE

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Keywords. Permanent pacemaker, cardiac surgery, bradyarrhythmias, valves surgery.

Introduction. Conduction abnormalities after cardiac surgery are observed in 17 to 34% of patients. Transient bradyarrhythmias resolve themselves in the first days after surgery, but persistent conduction disturbances requiring permanent pacemaker implantation (PPI) occur in 0.4–8.5% of patients undergoing heart surgery, depending on surgery type. Approximately 5% of PPI are following valvular surgery.

Aim. Aim of this study was to determine rate of intrahospital PPI after cardiac surgery at Pauls Stradiņš Clinical University Hospital.

Materials and methods. In the current single-center retrospective study, we reviewed Pauls Stradiņš Clinical University Hospital, Cardiac Surgery Centre medical records between years 2015 and 2017, of in total 3242 patients who had undergone open-heart surgery. Included were all patients with PPI postoperatively before discharge, for further analysis we specified 3 groups: patients with isolated aortic valve replacement (AVR), isolated coronary artery bypass grafting (CABG), tricuspid valve (TV) replacement or repair alone or with other types of surgery. Statistical analysis was performed with IBM SPSS 25. Descriptive statistics, Chi-Square or Fisher’s Exact Test, normal approximation (Wald) was used, p values < 0.05 were considered as statistically significant.

Results. One hundred thirty-five (4.2%) patients received a PPI after cardiac surgery, of these patients 24 following AVR, 2 following CABG and the majority – 71 following TV procedure, 38 patients received PPI following other combined procedures. Mean age of PPI patients standard deviation was 68.5 ± 10.5 years, 61 (45.2%) were men. Mean days of PPI after surgery was 6.0 ± 4.0. Of all PPI cases, PPI was performed after AVR, TV surgery and CABG in 17.8%, 52.6%, and 1.5% respectively. The incidence of PPI in group of all AVR patients was 3.3% (95% confidence interval 2.0–4.6%), CABG 0.2% (0.0–0.77%) and TV surgery 8.8% (6.9–10.9%; p < 0.05). Indications for PMI included complete AV block in 59 (44.4%), sinus node dysfunction in 25 (18.8%), and atrial fibrillation with a slow ventricular rate in 41 (30.8%) of cases. Complete AV block as an indication for PPI in AVR group was in 16 (66.7%), TV surgery 26 (36.6%) and in CABG in none of the patients (p = 0.33).

Conclusion. In our centre, patients undergoing heart surgery require a PPI in approximately 4.2% of cases. The risk of PPI was particularly higher after procedures where TV was involved, followed by AVR. Which can be explained by the anatomy of conduction system and its proximity to the TV and aortic valve structures in particular. The most often indication for PPM was complete AVB, that coincides with published data.
DIAGNOSTIC PREDICTIVE VALUE OF XPERT BLADDER CANCER MONITOR IN THE FOLLOW UP OF PATIENTS AFFECTED BY NON MUSCLE INVASIVE BLADDER CANCER (NMIBC)

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Keywords. Bladder cancer, NMIBC, follow-up, mRNA-based marker, recurrence, urine markers.

Introduction. Bladder cancer (BC) represents 5% of all new cancer cases in the European Union and is the 5th most common cancer in both sexes. At initial diagnosis, 70% are confined and not muscle invasive (NMIBC). Therefore, they do not require radical interventions, like radical cystectomy. BC possesses one of the highest recurrence rates of any other tumour, ranging from 50 to 70% within 5 years of the first treatment, requiring a lifelong follow-up with cystoscopy and cytology. The Xpert Bladder Cancer Monitor kit is a new urinary marker test based on the evaluation of the presence of 5 targets mRNAs (ABL1, CRH, IGF2, UPK1B, ANXA10), using real-time PCR.

Aim. To evaluate the diagnostic accuracy of the Xpert Bladder Cancer Monitor test, compared to urinary cytology, cystoscopy and/or histology in follow up of patients with history of NMIBC.

Materials and methods. 201 patients with a history of NMIBC undergoing active follow-up were included in this prospective study. After urine collection, the patient underwent cystoscopy and if cystoscopically positive, a transurethral resection of the bladder (TUR-B). Cytologies were evaluated according to the Paris classification system. Diagnostic accuracy including sensitivity, specificity, positive (PPV) and negative predictive value (NPV) of both tests were calculated.

Results. Patients were followed up for low grade (LG) NMIBC in 130 cases (64.7%) and for high grade (HG) in 71 cases (35.3%). One patient had to be excluded due to not diagnostic cytology and Xpert BC Monitor. From 200 patients, 47 had tumour recurrence (41 LG (87.2%), 6 HG (12.8%). The overall sensitivity of Xpert BC Monitor was significantly superior the one of cytology (46.8% and 10.6%). Of 153 cystoscopically/histologically negative patients 150 were cytologically negative, 3 were suspicious for high grade UC resulting in a specificity of 98%. The Xpert BC Monitor was correctly negative in 120/153 patients, resulting in a specificity of 78.4%. The PPV for cytology was 62.5% and for Xpert Monitor 40%. The overall NPP for cytology and Xpert Monitor was 78.1% and 82.7% respectively.

Conclusion. In this study, we report our first experience with a new mRNA-based urine test. Sensitivity of the Xpert Bladder Cancer Monitor Test was significantly higher than for cytology, especially for LG tumour. The test performed well in terms of specificity, but could not reach the extremely high value of cytology. PPV was slightly better in cytology and NPV performed approximately the same for both tests.
LAPAROSCOPIC AND OPEN REPAIR SURGERY
COMPARISON OF THE PERFORATED
GASTRODUODENAL ULCERS

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Keywords. Laparoscopic, open repair surgery, gastroduodenal ulcers.

Introduction. Laparoscopic surgery is becoming more popular every year, also as surgical treatment option in perforated peptic ulcers. But in this diagnosis it remains unclear if and how, comparing these two methods, laparoscopic surgery is safer and efficient for the patient.

Aim. Through the retrospective data analysis, compare both surgery options using information about the patients postoperative state.

Materials and methods. Medical records of all patients who underwent laparoscopic or open repair surgery of perforated peptic ulcers at the Riga East University Hospital Clinical Centre “Gailezers” between January 2013 and December 2016 were evaluated. The study included 190 patients. To compare and analyze postoperative state, data from medical records was used – duration of the acute symptoms (h), size of perforation (mm), operative time (min), postoperative hospital stay (days), time of the resumption of oral intake (days), time of the hospital bedrest (days), number of used analgetics and postoperative complications. Statistical analysis was carried out using SPSS statistics analyzing software, using Levene’s test for equality of variances and Mann–Whitney U test to compare medians. Also p values were calculated.

Results. From total of 190 patients, of whom, 38 received laparoscopic repair and 152 open repair, were included in this study. Comparing the duration of the acute symptoms in each group (OR = open repair; LS = laparoscopic) with t-test (Independent Samples), mean values were – LS = 4.618 h and OR = 6.158 h (p = 0.044 (< 0.05)). Size of perforation LS = 3.68 mm, OR = 7.03 mm (p < 0.001). Operative time – LS = 77.50 min, OR = 82.61 min and (p = 0.438 (> 0.05)). Postoperative hospital stay LS = 5.32, OR = 8.72 days (p < 0.001). Time of the resumption of oral intake LS = 3.18, OR = 4.34 days (p < 0.001). Time of the hospital bedrest LS = 3.24, OR = 5.19 days (p < 0.001). Number of used analgetics LS = 4.84, OR = 7.80 (p = 0.042). Mann–Whitney U test showed the same trend, where only operative time showed no significant differences (p > 0.05).

Conclusion. Laparoscopic surgery is comparable with open surgery in repair of perforated peptic ulcers. Advantages of laparoscopic surgery is shorter postoperative stay, earlier resumption of oral intake, shorter hospital bedrest time and less analgetic intake – which might suggest that there is less postoperative pain. However, with more detailed comparison and also prospective data, including tests about the quality of life, should be undertaken to further assess the safety and efficacy of laparoscopic repair for peptic ulcer perforation.
COMPARISON OF SALVAGE TOTAL MESORECTAL EXCISION FOLLOWING TRANSANAL ENDOSCOPIC MICROSURGERY AND PRIMARY TOTAL MESORECTAL EXCISION: CASE-MATCHED ANALYSIS

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Keywords. Rectal cancer, total mesorectal excision, transanal endoscopic microsurgery, salvage TME.

Introduction. Transanal endoscopic microsurgery (TEM) is a minimally invasive procedure, which allows local excision of early stage rectal cancer with organ preservation and can be used as an alternative treatment to radical surgery. In case of unfavourable histological features patients can undergo salvage total mesorectal excision (TME).

Aim. We aimed to compare intraoperative, short-term results and possible complications of salvage TME (sTME) following TEM and primary TME (pTME) procedures.

Materials and methods. In this retrospective study we analyzed data obtained from 27 patients’ charts, who had undergone rectum resection with TME for early rectal cancer between 2010 and 2017 at National Cancer Institute. Early sTME was performed in 9 patients, each patient that underwent sTME was compared with two patients that underwent pTME for early rectal cancer. Patients were matched on basis of gender, age, cancer stage and operative procedure. We recorded the demographics, tumour specifications, treatment, duration of surgery, postoperative results and early complications. Both groups were compared using Fisher’s exact test and Student’s T test.

Results. A total of 130 patients underwent TEM at the National Cancer Institute during study period, 9 (6.92 %) of those patients had to undergo sTME. The average patients’ age was 62.7 ± 7.07 years, 55.6 % of patients were female and 44.4 % were male. The average tumour size in sTME group was 2.8 ± 1.05 cm (range 1.5–5) and 2.61 ± 1.36 cm (range, 1–5) in pTME group (p = 0.696). Duration of surgery in sTME group was significantly longer on average of 43 minutes compared to pTME (p < 0.0267). Tearing of bowel wall during surgical procedure occurred for more patients in sTME group (p = 0.103). The rate of postoperative complications was similar in both groups (p = 0.55).

Conclusion. We demonstrated that sTME after TEM is a challenging procedure, even though it is not associated with increased morbidity or increased mortality. However, a previous TEM represents a risk factor for an increased rate intraoperative bowel perforation. These conclusions may be biased by the small numbers and the retrospective design of the study and should therefore be considered with caution.
THE COMPARISON OF POSTOPERATIVE HEMORRHAGE BETWEEN TRAUMATIC BRAIN INJURY AND BRAIN TUMORS

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Keywords. Brain trauma, tumours, hematoma.

Introduction. Postoperative brain bleeding is a dangerous complication. Causative factors are various yet ambiguous, thus it is valuable to find what is related with the outcome of patients who already have postoperative hematomas.

Aim. To evaluate what influences the outcome of patients with postoperative brain hematomas.

Materials and methods. Retrospective study was performed during 2014–2015. Patients who had brain surgery due to trauma or tumour and developed postoperative hematoma diagnosed with head computed tomography (CT) were included. Admission type, surgical, postoperative data, simplified acute physiology score (SAPSII), Glasgow coma scale (GCS) 7 days after surgery were evaluated. Statistical analysis was performed with Microsoft Excel 2010 and SPSS 21 programs. Results were statistically significant when \( p < 0.05 \).

Results. 153 patients (81 males, 72 females) were included; mean age – 61 ± 15 years. 62 patients were reoperated due to hematoma. 127 patients survived, 26 – died. SAPSII score varied from 6 to 84. Mortality rate was higher in trauma patients (\( p = 0.000 \)). GCS score 7 days after surgery varied significantly between trauma and tumour patients (\( p = 0.000 \)) with coma more frequent in trauma patients (\( p = 0.001 \)). More time was spent in intensive care unit (ICU) after brain traumas (\( p = 0.000 \)). Negative correlation was between subdural/epidural hematoma thickness and GCS score (\( p = 0.008 \)), positive – between hematoma thickness and time spent in ICU (\( p = 0.046 \)). Positive correlation was between midline structures dislocation and time spent in ICU (\( p = 0.02 \)) with higher incidence of death (\( p = 0.004 \)), negative – between dislocation and GCS score 7 days after surgery (\( p = 0.031 \)). Higher the systolic and medium arterial blood pressure during (\( p = 0.001, p = 0.002 \)) and 24 hours (\( p = 0.017, p = 0.015 \)) after surgery, higher the time spent in ICU. Higher SAPSII value leads to longer admission in ICU (\( p = 0.000 \)) and lower GCS score 7 days after surgery (\( p = 0.000 \)). Survivors had lower bilirubin value 24 hours after surgery (\( p = 0.016 \)). Patients in coma on the 7th day after surgery had higher SAPSII score (\( p = 0.000 \)), bilirubin (\( p = 0.015 \)), leucocytes (\( p = 0.007 \)) and potassium concentrations (\( p = 0.021 \)) 24 hours after surgery. Patients prescribed with anticoagulants spent less time in ICU (\( p = 0.004 \)). Survivors were significantly younger (\( p = 0.039 \)).

Conclusion. Traumatic brain injury, subdural and epidural hematomas thickness, midline structures dislocation, higher systolic and median arterial blood pressure, higher SAPSII score are related with worse outcome of patients.
CEREBROSPINAL FLUID CIRCULATION DISORDERS: 
A PILOT STUDY

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Keywords. Cerebrospinal fluid (CSF), ventriculostomy.

Introduction. Cine flow magnetic resonance imaging (MRI) technique is increasingly used to evaluate CSF flow parameters and their changes in obstructive and non-obstructive hydrocephalus. However, the exact values, which would ensure a positive effect of ventriculostomy or ventriculoplasty, are not known. Many researches are being done recently.

Aim. To determine cerebrospinal fluid flow parameters, which would indicate the necessity for ventriculostomy.

Materials and methods. A pilot study was designed during 2017. 12 patients were suspected of hydrocephalus and had to undergo cine flow MRI, yet, only 5 of them (4 females, 1 male were included in the final study due to a successful CFS flowmetry regime. The parameters evaluated were: stroke distance, maximal/minimal/peak mean velocities, maximal/minimal/mean systolic and maximal/minimal/mean/peak diastolic velocities. Parameters were evaluated in the cerebral aqueduct ampulla.

Results. 4 patients were diagnosed with obstructive hydrocephalus, 1 with normal tension hydrocephalus. 3 patients underwent ventriculostomy, 1 patient - lumbar puncture and 1 patient had no indications for surgery. After a surgery 2 patients improved clinically and 1 had a positive radiological dynamics. Preoperative the mean of parameters were: stroke distance 0.123 cm, max. velocity - 0.660 cm/s, min. - 0.023 cm/s, peak mean - 0.670 cm/s, max. systolic velocity 1.150 cm/s, max. diastolic - 0.550 cm/s, min. systolic 0.142 cm/s, min. diastolic - 0.055 cm/s, mean systolic velocity 0.140 cm/s, mean diastolic - 0.019 cm/s, peak diastolic velocity 0.503 cm/s.

Conclusion. Since it was a pilot study, we found some limitations that will be improved in the following prospective study. The main parameters that have to be evaluated are: stroke volume, flow rate, CSF flow void, peak systolic velocity - they will be added. The maximal/minimal/mean peak velocities will remain. 3 regions of interests (ROI) will be evaluated in the axial MRI scan - at the margin of cerebral aqueduct (ROI1), concentric around the ROI1 (ROI2) and in the midbrain, where CSF flow is absent (ROI3). The parameters will be calculated at the three parts of an aqueduct: at the inlet, ampulla and pars posterior of a cerebral aqueduct. We have not had any patients that would not have improved after a surgery, therefore, until now we were unable to evaluate the values that would indicate the necessity for ventriculostomy and would ensure improvement after it. It is expected to be determined in the future study.
CONSCIOUSNESS STATE ALTERATION DYNAMICS CAUSED BY CEREBRAL ANEURYSM RUPTURE

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Keywords. Cerebral aneurysm, aneurysm rupture, consciousness dynamics.

Introduction. Immediately after cerebral aneurysm rupture patient condition deteriorates heavily and only after urgent surgical intervention it can begin to improve. Patient admission state, timing of the intervention and consciousness dynamics during hospitalization may well reflect the complication rate and outcome for the patient.

Aim. The aim of this research was to evaluate patient consciousness and its dynamics after spontaneous subarachnoid hemorrhage from cerebral aneurysm.

Materials and methods. Prospective study of patients with confirmed cerebral aneurysm as a cause for sudden spontaneous subarachnoid hemorrhage who were admitted to Republican Vilnius University Hospital’s department of Neurosurgery was carried out in the period from November 15th 2016 to December 31st 2017. On the day of admission patients were given a grade of World Federation of Neurosurgical Societies (WFNS) grading system and were examined periodically during admission and on 2nd/3rd, 7th, 14th, 30th postoperative days. The examination included consciousness evaluation by Glasgow Coma Scale (GCS), basic neurological examination and patient head CT scan assessment for aneurysm location and size, possible postoperative bleeding, ischemia, vasospasm or late hydrocephalus.

Results. The study included 23 patients, most of them – 12 (52.2 %) were women. Mean participant age was 59.2 ± 12.8 years and the majority of patients (95.7 %) underwent immediate intervention. Intervention groups are as follows: surgical clipping of the aneurysm – 15 (65.2 %), endovascular coiling – 6 (26.1 %), combination of both treatment options – 1 (4.3 %). Most of the intracranial aneurysms (71.4 %) were predominantly found in the anterior arterial basin of a. carotis interna (ICA) and the most common intracranial aneurysm location was a. communicans anterior (AComA) – 12 (42.8 %). Approximately one fifth of participants were carrying multiple aneurysms. Comparing patient groups by WFNS grade and GCS dynamics showed relevant predictions of better consciousness level of WFNS I–II vs. WFNS IV–V grade patient groups on admission (WFNS I–II GCS0 15–13 vs. WFNS IV–V GCS0 10–4.5, p = 0.000) and on the 2nd/3rd day postoperatively (WFNS I–II GCS2/3 12.8–13.5 vs. WFNS IV–V GCS2/3 10.1–8.5, p = 0.067). However, there were no significant results comparing patient consciousness dynamics with WFNS grade on 7th, 14th and 30th postoperative days. Patient consciousness deteriorated on the 7th postoperative day significantly if there was a cerebral vasospasm present (No vasospasm GCS7 13.6 vs. Vasospasm GCS7 8.1, p = 0.037).

Conclusion. The most common intracranial aneurysm location is AComA. WFNS grading system is useful for patient consciousness prediction during admission and on 2nd/3rd postoperative days. On the 7th postoperative day patient consciousness deterioration is mainly caused by cerebral vasospasm.
COMPLICATION RATE PREDICTION AFTER SUBARACHNOID HEMORRHAGE USING MODIFIED FISHER GRADING AND HIJDRA SUM SCORING SYSTEMS

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Keywords. Subarachnoid hemorrhage, modified Fisher grade, Hijdra sum score.

Introduction. Extravasated blood in the basal cisterns, fissures and ventricles of the brain can complicate the patient condition by inducing local vasospasm or occlusive hydrocephalus. The amount of subarachnoid hemorrhage in head CT scan can be assessed by modified Fisher grading scale and Hijdra sum scoring (HSS) system.

Aim. The aim of the study was to compare modified Fisher grading scale and Hijdra sum score system in effectiveness of complication rate prediction for patients after spontaneous subarachnoid hemorrhage.

Materials and methods. Retrospective study of patient visual data from head CT scans at Republican Vilnius University Hospital's department of Neurosurgery was performed in the period from November 15th 2016 to December 31st 2017. Cerebral aneurysm caused spontaneous subarachnoid hemorrhage amount was evaluated by modified Fisher grading scale and HSS on the day of admission and on 1st, 2nd/3rd, 7th, 14th, 21st postoperative days. Periodical consciousness evaluation with additional neurological examination was carried out on the same terms. Supplementary clinical and radiological information regarding complications were taken into account. Statistical data was analyzed with SPSS v.23. Statistical significant confidence level of 90% was chosen (p < 0.1).

Results. The study included 23 patients, who were given a grade of World Federation of Neurosurgical Societies (WFNS) grading system at admission. WFNS rates were: I – 7 (30.4 %), II – 6 (26.1 %), III – 0, IV – 7 (30.4 %), V – 2 (8.7 %). According to patient WFNS groups Hijdra sum scores were significantly higher on the day of admission for higher WFNS grade (HSS0 WFNS I 10.8 ± 7.4, WFNS II 16.2 ± 8, WFNS IV 18.1 ± 3.9, WFNS V 25.5 ± 6.3, p = 0.064) and modified Fisher grades were significantly higher on the 1st postoperative day for higher WFNS grade (Modified Fisher1 WFNS I 2.4 ± 1.6, WFNS II 4, WFNS III 3.8 ± 0.4, WFNS IV 4, p = 0.097). There was a positive moderate correlation between HSS0 and WFNS grade (r = 0.554, p = 0.011). HSS1 ventricular component predicted cerebral vasospasm (No vasospasm HSS1 2 ± 1.7 vs. Vasospasm HSS1 4.6 ± 3.2, p = 0.05).

Conclusion. Hijdra sum score on the day of admission was significantly higher with every WFNS grade of the patient groups. There was a moderate positive correlation between HSS0 and WFNS grade. On the first postoperative day modified Fisher grade was significantly higher with higher WFNS grades but HSS1 ventricular component predicted cerebral vasospasm which modified Fisher grade did not.
PERCEPTION OF THE DISEASE AND QUALITY OF LIFE IN LUNG CANCER PATIENTS

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Keywords. Lung cancer, quality of life, questionnaire.

Introduction. According to the World Health Organization (WHO) data, lung cancer is the fifth main reason, causing death. Lung cancer patients experience a variety of negative emotions, that affects their physical, psychological wellbeing (quality of life).

Aim. The aim of our study was to examine the patients understanding about the disease, to evaluate the impact of lung cancer on emotional, physical status, future expectations and religious beliefs.

Materials and methods. During the period from March 2014 to May 2017, a prospective study with lung cancer patients had been performed in Centre of Pulmonology and Allergology of Vilnius University Hospital Santaros Clinics. A questionnaire was created concerning lung cancer impact on patients quality of life and perception of the disease. The study population consisted of 116 consecutive questioned patients (78 % men; mean age 63 ± 8.6 years; average duration of the disease – 12 months).

Results. 37 % of the patients could not answer the question, how do chemotherapeutic drugs work. 35 % worry about adverse effects of chemotherapeutic therapy. 56 % did not suffer the long-term emotional effects of lung cancer. 84 % patients physical activity decreased from the onset of the disease. 36 % quit smoking after learning their diagnosis. 34 % had taken additional, in their opinion, health enhancing drugs. 81 % of the questioned patients religious beliefs, after lung cancer was diagnosed, did not change and 16 % claim it became stronger. 41 % were reluctant to predict the course of the disease.

Conclusion. A large number of patients deny experiencing long-term emotional changes and avoid anticipating the disease outcome. However, majority of patients admit that lung cancer diagnosis had a significant influence on their physical condition. A significant amount of patients with lung cancer do not understand treatment effectiveness, so many take additional remedies and do not change their smoking habits. The information which patients receive about disease and treatment, is not sufficiently understood or quickly forgotten, so in order to increase the benefits of the treatment, a doctor should provide information in the most comprehensible and understandable way.
THE SPECTRUM OF LYMPHOPROLIFERATIVE DISORDERS
2016: ONE CENTRE STUDY

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Keywords. Lymphoproliferative disorders, lymphoma, lymphoid malignancies.

Introduction. A lymphoid malignancy, or lymphoproliferative disorder (LPD), is a clonal lymphocyte proliferation resulting in an excessive production of B or T lymphocytes. LPDs are quite rare and still poorly understood among non-haematologists. In Lithuania, there is no functioning data-base of lymphoid malignancies, therefore the data of pathology centres is the only source that is representative not even in quantity, but also in quality. National Center of Pathology is the biggest pathology centre in Lithuania which specializes in haematopathology and we assume that its one-year LPD analysis accurately shows Lithuania's epidemiological situation of LPDs.

Aim. The aim of this study was to assess the distribution of LPDs diagnosed in 2016 in National Center of Pathology according to histological criteria and to compare the results to the western countries.

Materials and methods. Using the data-base of National Centre of Pathology, we retrospectively found 628 patients who underwent biopsy and were diagnosed with a primary lymphoid malignancy in 2016. The cases were classified according to WHO (World Health Organization) Classification of Tumours of Haematopoietic and Lymphoid Tissues (2016 revision).

Results. In 2016, there were 575 primary non-Hodgkin lymphomas (NHL) and 53 Hodgkin lymphomas (HL). Multiple myeloma, monoclonal gammapathy of unknown significance, leuakemias and plasmacytomas were excluded from the further analysis. The most common were diffuse large B cell lymphoma (DLBCL) (119/44 % among B NHLs), B marginal zone lymphoma (B MZL) (50/20 %) and B follicular lymphoma (B FL) (38/15 %). Mature T cell lymphomas were found in 12.2 % of NHL patients. The most common localizations were haematopoietic system (60.1 %) and gastrointestinal tract (14.6 %). The most significant differences comparing our epidemiology with the one represented in WHO were more common DLBCL (44 % comparing to 37 %) and B MZL (18 % vs. 9 %) and less common B FL (15 % vs. 29 %) and B small lymphocyte lymphoma (B SLL) (2 % vs. 12 %). The DLBCL/B FL ratio in our centre was 3.13, meanwhile it as low as 1.38 in the western countries.

Conclusion. The most common lymphoid malignancies were DLBCL, B MZL and B FL. Usually they occurred in haematopoietic or gastrointestinal systems. Comparing to western countries, we had more DLBCL and B MZL, but less B FL and B SLL. DLBCL/B FL ratio in our centre was 3.13 and it is significantly higher than in western countries. For a more accurate LPD epidemiological analysis in Lithuania, other pathology centres should be included in further studies.
MICROVASCULAR TISSUE TRANSFER SURGERY: 
FLAP SURVIVAL ANALYSIS

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Keywords. Microsurgery, flap, survival.

Introduction. Nowadays free microvascular flap survival rate is nearly 100%, nevertheless full flap necrosis still occurs. This can lead to patients’ prolonged hospitalization, greater morbidity and lower quality of life.

Aim. Aim of this study is to evaluate survival rate of free microvascular flaps in The Centre of Plastic and Reconstructive Microsurgery of Latvia.

Materials and methods. A retrospective study was conducted from 2011 until 2016. Patients’ medical histories database was analyzed. Type of flap, recipient region, any early complications and therapy was recorded.

Results. 214 cases of free microvascular flap transfer surgeries were analyzed. Mean patients’ age was 49 years (range 2–85), 80% were male patients. 114 patients had significant chronic diseases. Reasons for reconstructive surgery included tumor (114), injury (47), soft-tissue infection (12) and osteomyelitis (25), scar tissue (7), pseudarthrosis (6). Flaps were transferred to head and neck (114), torso (3), upper limb (29), lower limb (68). Following flaps were used – radial artery flap (77), fibular osteocutaneous flap (46), lateral arm flap (22), gracilis myocutaneous flap (16), scapular flap (15) anterolateral thigh flap (12), latissimus dorsi muscular flap (8), inguinal flap (7), rectus abdominis myocutaneous flap (3), costal osteomyocutaneous flap (3), medial sural artery perforator flap (2), iliac crest osteocutaneous flap (1), free dorsalis pedis flap (1). Overall flap survival was 94.4%. Total flap necrosis occurred in 12 cases, while minor complications (hypoperfusion, marginal necrosis) in 38 cases (17.8%). For rheologic therapy 10% dextran solution in 207 cases and anticoagulants in 34 cases were prescribed.

Conclusion. All complications occurred in patients with trauma, infections and tumours and more often in patients with chronic diseases (26.3% vs. 20%). Although differences did not have a statistically significance, these risk factors must be considered in order to choose the most suitable treatment for every patient.
COMPARISON OF AESTHETIC OUTCOMES OF POLLICIZATION AND TOE-TO-HAND TRANSPLANTATION

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Keywords. Aesthetic results, thumb reconstruction, thumb hypoplasia

Introduction. Pollicization and toe-to-hand transplantation are two main procedures to form a new thumb. Pollicization has been used for many years as first choice procedure for patients with congenital thumb defects such as thumb hypoplasia. The technique provides good functional results, but an unusual aesthetic outcome as a hand is left with 4 fingers. Toe-to-hand transplantation is newer and more complex procedure, which only recently has been used to treat patients with thumb hypoplasia. Early results show that functional outcomes are as good as in pollicization. Thus, the main difference between techniques is whether a patient’s hand is left with 4 or 5 fingers.

Aim. Compare aesthetic results of pollicization and toe-to-hand transplantation.

Materials and methods. The study population included all patients, who underwent these procedures due to thumb hypoplasia from 2008 until 2016. All procedures were done in The Centre of Plastic and Reconstructive Microsurgery of Latvia. Follow-up examination was performed at least 6 months after the surgery. Patients were asked to give Visual Analog Score (VAS) from 1 (the best score) to 10 (the worst score) on the visual appearance of a reconstructed thumb. Also, an internet survey was created. People were asked to give reversed VAS (1 for the worst score and 10 – for the best) for each technique.

Results. In period from 2008 until 2016 2 patients underwent transplantation surgery, 3 patients – pollicization. Mean VAS given by patients and their parents was 4 for pollicization group and 1.5 for transplantation. Internet survey was completed by 290 people. 67 % of respondents were women, 33 % – men. Most of them (64.2 %) were aged from 19–30 years and have acquired higher education (67 %). 49 % of respondents were professionally related with health care and medicine and 51 % were not. Mean VAS for pollicization was 5.84 and 7.04 for transplantation. Difference in mean scores was statistically significant (independent samples t-test, p < 0.001). Health care professionals gave higher score for both techniques (7.31 vs. 6.77 for transplantation and 5.98 vs. 5.62 for pollicization). Statistical significance was found for transplantation (independent samples t-test, p < 0.001).

Conclusion. Both patients and general population consider that a 5-finger hand with transplanted thumb has better aesthetics than a 4-finger hand. By providing multiple treatment options for patients the best possible outcome can be achieved.
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WIDE-NECKED INTRACRANIAL ANEURYSM TREATMENT WITH NEUROFORM ATLAS STENT SYSTEM – SINGLE CENTER EXPERIENCE

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Keywords. Wide neck aneurysm, coils, stents.

Introduction. Nowadays coiling becomes method of choice for treating patients with intracranial aneurysms however endovascular approach of wide neck intracranial aneurysms may be challenging, due to the reason that coils can herniate into the parent vessel. Neuroform ATLAS stent system is newly approved for treatment of intracranial wide neck aneurysms.


Materials and methods. Patients were selected from hospital database and retrospectively reviewed for wide neck intracranial aneurysms treated with neuroform ATLAS stent system. Aneurysm size, clinical presentation, aneurysm location and imaging follow-up were included in the analysis. Angiographic images in PACS system were analyzed before and after the treatment.

Results. 34 patients with 35 aneurysms were treated with neuroform ATLAS stent systems. 23 (67.6%) females and 11 (32.4%) males in the age group from 32 to 77, mean age 65. Mean aneurysm size was 5.4 mm, range from 2–12 mm. Mean Dome to neck ratio was 1.35 and range from 0.8–2.3. Affected intracranial arteries were: arteria carotis interna 20 (57.1%), a. communicans anterior 4 (11.4%), a. cerebri media 4 (11.4%), a. communicans posterior 3 (8.6%), a.basilaris 3 (8.6%), a. vertebalis 1 (2.9%). 19 (55.9%) patients had no symptoms, 6 (17.7%) had severe headaches, 5 (14.7%) had ruptured aneurysms/ subarachnoid haemorrhage, 2 (5.9%) patients had nerve compression (n.occulomotorius), 1 (2.9%) had sudden episodes of dizziness during last year and 1 had visual impairment. From these 34 cases 7 (20.6%) of them had aneurysm recurrences prior to the treatment of neuroform ATLAS stent system.18 patients had follow up 6 months after the procedure. After the follow up assessment of aneurysms, according to the Raymond-Roy Occlusion Classification (RROC), 2 patients had a residual neck (RROC2) and 16 patients had complete occlusions (RROC1). All procedures were without complications and successfully were implanted stents and coils.

Conclusion. The neuroform stent is safe and effective treatment of wide neck intracranial aneurysms. The results we obtained are promising, but there will be need for long-term imaging and clinical follow-up.
A SUMMARY AND COMPARISON OF THE MOST COMONLY AFFECTED CORONARY ARTERY LESIONS BY SEGMENT IN POPULATION USING COMPUTED TOMOGRAPHY ANGIOGRAPHY AND INVASIVE CORONARY ANGIOGRAPHY

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Keywords. Computer tomography angiography, invasive coronary angiography, coronary artery disease.

Introduction. Invasive coronary angiography (ICA) is traditionally used for evaluation of presence and severity of coronary artery disease. ICA has a 2-dimensional imaging therefore atherosclerotic plaques in the arterial wall cannot be accurately visualized. Multidetector computed tomography angiography (CTA) strength is that it is able to not only visualize luminal narrowing but also the extent of atherosclerotic plaque in the arterial wall.

Aim. To find the most commonly affected coronary artery segments. Comparing CTA to ICA: can CTA method and results be equivalent ICA.

Materials and methods. Among 94 patients 727 vessels with varying degree of stenosis both from CTA and ICA were included in this study. All coronary lesions above 10 % were analyzed, divided into one of the 17 segments. Each segment group then was divided into two subgroups: coronal lesions bellow 50 percent and above 50 percent. After both methods were compared in each segment and subgroup.

Results. From 727 vessels examined by both methods CTA found 509 lesions and ICA 218. The most affected segments bellow 50% by CTA were RCA2seg 38 times, LM5 30, LAD6 29, and LCX1Iseg 27. By ICA RCA 7x, LM5 5, LAD6, RCA2seg and OM11 4x. Lesions above 50% by CTA LAD6 55, LAD7 49, RCA2 29. By ICA LAD7 40, LAD6 39 and RCA2 29. When comparing the lesions by both methods in most common affected segments under 50%: LM5, LAD6, LCX1 and RCA2 it showed no correlation between both methods where CTA visualized more stenosis then ICA. However in lesions above 50%: LAD6, LAD7 and RCA2 it showed a correlation between the two methods (p < 0.001). Analyzing all coronary artery segment lesions (17) by severity of stenosis it showed a correlation in 12 segments: LM5, LAD6, LAD7, D1, D2, LCX1, CX13, OM12, M2, RCA1, RCA2 and RCA3 (p < 0.001)

Conclusion. CTA found twice as more lesions in coronary arteries then ICA; note that not all of the lesions bellow 50 % are noted in ICA. Regarding the lesions above 50% and all of the segments together there is a positive correlation that proves CTA may facilitate improved guidance of percutaneous treatment of coronary lesions.
COMPARING NONINVASIVE FRACTIONAL FLOW RESERVE FROM COMPUTED TOMOGRAPHY ANGIOGRAPHY WITH INVASIVE ANGIOGRAPHY FOR CORONAL ARTERY LESIONS

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Keywords. Fractional flow reserve, coronary computed tomography angiography, invasive coronary angiography, coronary artery disease.

Introduction. Fractional Flow Reserve (FFR) is a lesion specific technique to determine functional importance of a coronary stenosis. Invasive FFR is a gold standard for detecting hemodynamic changes in coronary artery lesions, however noninvasive FFR derived from computed tomography angiography (CTA) offers an alternative way of evaluating lesion-specific ischemia. Recent studies have shown a high diagnostic performance of CTA for the identification of anatomically obstructive coronary stenosis compared with ICA.

Aim. Important considerations whether are the diagnostic accuracy of $\text{FFR}_{\text{CT}}$ sufficient and can $\text{FFR}_{\text{CT}}$ guide intervention without invasive FFR confirmation.

Materials and methods. From 727 examined vessels by CTA and ICA together FFR was measured in 151 vessels with hemodynamic changes and lesions in 94 patients. ICA FFR was measured during the procedure with pressure-monitoring guidewire. CTA $\text{FFR}_{\text{CT}}$ was calculated in specialized center in USA. Diagnostic performance of FFR was compared to $\text{FFR}_{\text{CT}}$.

Results. FFR and $\text{FFR}_{\text{CT}}$ were measured in 151 vessels LAD 74, RCA 39, LCX 14, CX 7, D1 5, OM1 4, OM2 3, OM 2, dRCA and M1 1. 3 most common measured vessels were LAD, RCA and LCX. Angiography FFR for 3 most frequent vessels: LAD 0.78, RCA 0.89, LCX 0.83 however CTA calculated a lower $\text{FFR}_{\text{CT}}$: LAD 0.73, RCA 0.82, LCX 0.77. Comparing between FFR and the severity of stenosis in both methods there is a correlation the greater stenosis will equal a lesser FFR (FFR and stenosis $p < 0.001$, $\text{FFR}_{\text{CT}}$ and stenosis $p < 0.001$). Though in studies found not every major stenosis will have a change in hemodynamic flow. Cronbach’s alpha test was used to compare both CTA and ICA whether one method could replace the other. The 3 most common vessels were compared: FFR/ $\text{FFR}_{\text{CT}}$ LAD 0.80, FFR/ $\text{FFR}_{\text{CT}}$ RCA 0.75, and FFR/ $\text{FFR}_{\text{CT}}$ LCX 0.74. Range $0.8 > a \geq 0.7$ is acceptable and $0.9 > a \geq 0.8$ is good; meaning one could replace the other.

Conclusion. $\text{FFR}_{\text{CT}}$ has a high performance for diagnosing ischemic lesions and in future may replace ICA where it is unavailable, lower costs and time and lower the risks after an invasive procedure.
RADIATION DOSE OPTIMIZATION IN CONVENTIONAL
CHEST RADIOGRAPHY

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**Keywords.** Radiography, dose optimization.

**Introduction.** In today’s world of medicine not only has the conventional radiography evolved, but it has secured its place as the one of the most informative, non-invasive tests for solving a variety of clinical problems. However, as the radiation dose being relatively low in chest radiography, it is also being reported as the most common procedure of all diagnostic X-ray examinations, associated with 10–20% of collective radiation dose for patients.

**Aim.** The purpose of this study was to evaluate how radiation dose and image quality are dependent on radiographic parameters in conventional chest radiography.

**Materials and methods.** Chest phantoms were used to simulate an average-sized adult chest, so that the response of the imaging system will be similar to that of a standart PA chest radiography. The phantoms were filmed with different tube voltage (109–141 kV) and different copper filtration from 0.1 to 0.3 mm thickness respectively. Radiographic parameters: distance to detector at 1800mm and integrated Al filter were not changed. Imaging parameters ($kVp$, $mAs$, exposure time) were recorded to estimate the dose-are product (DAP) as the measure unit of radiation exposure. Advert to estimated results we have examined the staff of VULSK who underwent the annual healthcare check-up using the modified protocol of standart chest X-ray.

Patient specific parameters (age, body mass index) were recorded before the first examination. Using higher/lower tube voltage and Cu filtration of 0,3mm dependent upon previous chest x-ray protocol and the results of phantom filming, we calculated how radiation dose was reduced. Therefore, all images were assessed by radiologists who managed to evaluate the quality of images with different parameters using a questionnaire devised by “European guidelines on quality criteria for diagnostic radiographic images”.

**Results.** The mean DAP of protocol with Cu filtration of 0,3 mm and 125 kV was significantly lower compared to previous standart protocol without Cu filtration ($p < 0.05$). Additionally, the mean DAP was also notably lower with Cu filtration of 0,3mm and 133 kV. There also been a significant relation between DAP growth dependent on patient’s BMI ($p < 0.001$).

**Conclusion.** We studied the performance of one conventional radiography system with regard to the DAP and different radiographic parameters. The new protocol may help to optimize the radiation dose without a decrease in image quality as there were no significant difference according to the radiologists.
COLLIMATION AND PATIENT DOSE IN CONVENTIONAL RADIOGRAPHY

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Keywords. Conventional radiography, collimation, collimator, calibration, effective dose, radiation risk.

Introduction. It is said that the importance of collimation in conventional radiography shouldn’t be underestimated. Collimation is one of the aspects that affect patient dose and is almost solely the responsibility of the radiographer, when it comes to individual dose optimisation. There are some empirical studies that describe the effect of collimation on patient doses. At the same time, there is not any research found on the subject of collimator calibration and its effect on patient doses.

Aim. The aim of the study was to evaluate the effect of collimation on patient doses and radiation risks by calibrating the collimator for the Siemens Ysio DR system and Apelem Magnum CR system.

Materials and methods. Empty x-ray images in various sizes were taken in two directions: through the positioning table and through the wall mounted table. As the aim was to evaluate the size of x-ray images, all the other parameters were left constant, like focal spot, active middle AEC chamber, sensitivity, focus to receptor distance (FRD), focus to table distance (FTD) and voltage. The collimator was centred to the bucky. On the Siemens Ysio DR system the images were taken with two different voltages, to see if the results depend on it. The widths and heights of acquired images were measured with the freeware program ImageJ. To convert the measurements into mm special x-ray rulers were placed on the receptors in both directions. Finally, linear calibration lines were drawn and functions created for every height and width in Excel using the least squares method where the slope represented the calibration factor.

Results. The results on the Siemens Ysio DR system showed that they don’t depend on the voltage the images were taken with. The difference between calibration factors mostly appeared in the third decimal point and the corresponding intercepts rounded up to the same values. The calibration factors for the Siemens Ysio DR system collimator were all basically equal to 1 and the intercepts close to 0 mm. The calibration factors and intercepts for the Apelem Magnum CR system collimator were not much but noticeably more different from 1 and 0 (mm), respectively. When Lumbar spine supine AP image was simulated with PCXMC program, the resulting whole body effective dose decreased 9.7 % and radiation risk 11.8 % when set readings (20.0 × 35.0 cm) were compared to calibrated readings (20.4 × 31.0 cm).

Conclusion. Calibrating collimators could add to the precision on evaluating patient doses and radiation risks, especially with older systems with analogue collimators. Even though in this example the doses would have been overrated, it could always be the other way around.
KNOWLEDGE ABOUT IONIZING RADIATION AMONGST COMMUNITY AND MEDICAL STAFF

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Keywords. Ionizing radiation, knowledge, patients knowledge, physicians knowledge.

Introduction. Imaging tests become one of the main human-made ionizing radiation sources in these days. Computed tomography (CT) performed within one year could cause more than 29,000 oncological diseases in the future. Further, high dose of radiation could cause acute sickness, infertility or immunosuppression. It is always important to evaluate community and medical staff knowledge level of radiation to improve the current situation.

Aim. To identify community and medical stuff knowledge about ionizing radiation and to evaluate how did they get information about it.

Materials and methods. The study was conducted in Lithuanian university of health sciences from December 2016 to July 2017. Original questionnaire was prepared by researchers using published data in this field. All participants were classified in three groups – radiology related, other medical stuff and radiology unrelated persons. The ratio of participants correct answers to all questions was converted to the percentage and data was processed by using analysis software package SPSS 24 (Mann Whitney, Pearson Chi square, Kruskal-Wallis tests).

Results. 184 volunteers were surveyed. The average of respondents results was 67.5 %. The average of correct answers in female group was 66.4 % and in male group was 70.9 %.

Knowledge of female and male did not show statistically significant difference. 75.5 % know that X-ray involve radiation and 69.6 % of participants know that CT involve it as well. Respondents related to radiology and medical physicians statistically had equal knowledge level. Also, 50.0 % of respondents were informed or had information about radiation before radiological tests from different sources. There was no statistically significant difference between knowledge of subjects who were informed about medical radiation and those who were not informed.

Conclusion. There is no difference between females and males, medical physicians and radiologists, informed and uninformed persons knowledge about ionizing radiation. 75.5 % know that X-ray involve radiation and 69.6 % of participants know that CT involve it as well. Unfortunately, half of participants state that were never informed about ionizing radiation.
MRI AND CT SCANS COMPARATIVE VALUE IN SPREAD BREAST CANCER DIAGNOSTICS

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Keywords. MRI, CT, cancer.

Introduction. Breast cancer is one of most prevalent malignant diseases worldwide. It has high morbidity and mortality values. In 2012 there was around 1,7 million new cases of breast cancer globally and its’ fatal outcomes count is around 571 000 each year. From all new cases of breast cancer around 5−6 percent of patients already have distant metastases. Occurrence of metastases has negative impact on the outcome, that is why timely choice of instrumental diagnostic tests is significant in diagnosing and treating breast cancer metastases and choosing the most effective treatment tactic. When suspecting breast cancer, it is important to determine optimal test method and/or combinations of them to determine possible distant metastases, because timely diagnosed it can improve patient outcomes and prolong life expectancy.

Aim.
1. To compare MRI and CT scan value in diagnosing spread breast cancer.
2. Evaluate how MRI and CT tests influence spread breast cancer treatment.

Materials and methods. Retrospective research was performed, in which case files of women who were treated for spread breast cancer (ICD-10 diagnosis C50) in LSMUL KK Oncology clinic in 2015–2016. Case files of 31 women for whom MRI and CT scans were performed while suspecting breast cancer recurrence. Instrumental examinations results (MRI, CT) in patients’ medical records were analysed and treatment plan was assigned after the MRI and CT examination.

Results. Mean age was $57 \pm 1.2$ years, where the youngest patient was 47 and the oldest 71. Breast cancer molecular types were identified: most prevalent was B luminal HER2 positive subtype (41.9 %), B luminal was found in 30 % of cases, A luminal in 20 % and triple negative in only 5 % cases. Based on research data it was found that CT scan was more sensitive in diagnosing distant metastases. Metastases were found for 64.5 % of patient with CT scan while only 35.5 % were detected while using MRI. When evaluating treatment options after radiological tests the most of patients underwent chemotherapy alone (48.38 %), when data for metastases was insufficient patients were left for further active monitoring (35.5 %). In cases of local spread surgery (6.45 %) or radiotherapy (9.6 %) alone were used.

Conclusion.
1. CT scan is more sensitive in diagnosing recurrence of breast cancer (64.5 %) in comparison to MRI (35.3 %).
2. Treatment choice is defined not only by the number of metastases detected by CT or MRI scans, it is also influenced by current symptoms. When radiological tests do not show metastases, active monitoring is chosen. In systemically spread and severe symptoms chemotherapy is used (48.38 %), in local spread radiotherapy (9.6 %) or surgery (6.45) is used.
RADIOIODINE $^{131}$I TREATMENT EFFICACY EVALUATION: DOSE/RESPONSE ANALYSIS

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Keywords. Dose/response analysis; Hyperthyroidism; Radioiodine; $^{131}$I.

Introduction. Radioiodine $^{131}$I treatment for benign hyperthyroidism is a well established technique used for more than 60 years. However there is still no clear consensus regarding the most appropriate dosing regimen: some centers use fixed doses method while others individually calculate doses for every patient.

Aim. The aim of this study is to determine if the administered dose of radioiodine per gram of hyperfunctioning thyroid tissue influence the response to the treatment on 6–12 month follow-up.

Materials and methods. This is a retrospective clinical history analysis of 31 patients (2 male, 29 female) treated with fixed doses of radioiodine for benign hyperthyroidism. Thyroid mass, dose of administered radioiodine and laboratory indicators of thyroid function were analyzed. Thyroid mass was determined by calculating the volume of hyperfunctioning thyroid tissue using $^{99m}$Tc single photon emission computed tomography (SPECT) images. Therapeutic response was determined by laboratory values of thyroid-stimulating hormone (TSH), triiodothyronine (T3) and thyroxine (T4) 6–12 months after treatment and classified either as sufficient (hypothyroidism or euthyroidism, 21 patients) or insufficient (hyperthyroidism, 10 patients) therapeutic response. Using these data the dose of administered radioiodine per gram of thyroid tissue was calculated. Mean dose per gram of thyroid tissue was then compared between the patient groups of sufficient and insufficient therapeutic response. T-test and logistic regression statistical tests were used (IBM SPSS Statistics v23).

Results. Mean dose of administered radioiodine per gram of thyroid tissue was higher in sufficient therapeutic response group (mean dose 6.89 MBq/g) than in insufficient therapeutic response group (mean dose 4.86 MBq/g; T-test; p = 0.018). According to logistic regression model, higher doses per gram improve the chance to end up in a sufficient therapeutic response group (OR = 1.81; p = 0.036).

Conclusion. The results suggest that higher doses of radioiodine per gram of thyroid tissue may yield better therapeutic outcomes compared to lower doses. These results support a hypothesis, that individually calculating the doses prior to treatment might help to achieve an adequate dose for a sufficient clinical response while lowering the risk of hypothyroidism due to unnecessarily high doses, thus this approach might be a more beneficial dosing regime than fixed doses regime.
DIAGNOSTIC ACCURACY OF MPMRI AND BPMRI IN
SIGNIFICANT PROSTATE CANCER DETECTION

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Keywords. Prostate cancer, magnetic resonance imaging (MRI), multiparametric MRI, diffusion-weighted imaging, significant cancer.

Introduction. To study whether a short unenhanced biparametric MRI (bp-MRI) matches mp-MRI in detecting significant PCa.

Aim. Bp-MRI is sufficient to mp-MRI for significant PCa detection.

Material and Methods. A retrospective analysis of 61 patients. Prostate specific antigen level ranged from 0.695 ng/ml to 100 mg/ml (mean ± SD: 8.41 ± 14.08 ng/ml). Low risk group consisted of 26 (43 %) patients, medium risk – 11 (18 %) and 24 (39 %) in high risk group. 30 TRUS biopsies, 23 transperineal biopsies and 8 radical prostatectomies were performed in the study group. Two radiologists separately assessed the mp-MRI examination (T2-weighted [T2W] imaging, diffusion-weighted imaging [DWI], apparent diffusion coefficient map [ADC-map] and dynamic contrast-enhanced imaging [DCE]). Two months later, the bp-MRI version (T2W imaging, DWI, and ADC-map) was evaluated. Statistical analysis was carried out applying SPSS software, v.23, p < 0.05.

Results. Reader 1: Assessing mp-MRI: sensitivity of 0.9342, and specificity 0.875. Assessing bp-MRI: sensitivity of 0.9111, and specificity 0.8125.

Reader 2: Assessing mp-MRI: sensitivity of 0.9778, and specificity 0.75. Assessing bp-MRI: sensitivity of 0.8889, and specificity 0.875. mp-MRI: intra-reader agreement Cohen’s Kappa (k) was 0.7924 for reader 1 (95% confidence interval [CI], 0.7924–0.9668) and 0.7746 for reader 2 (95% CI -0.5853–0.9639). bp-MRI: intra-reader agreement Cohen’s Kappa (k) was 0.7093 for reader 1 (95% confidence interval [CI], 0.5067–0.9119) and 0.7204 for reader 2 (95% CI 0.5255–0.9153).

Conclusion. Bp-MRI is sufficient to mp-MRI for significant PCa detection.

MpMRI and bp-MRI have the same amount of increased insignificant PCa false positives. Consensus reading may be the way to keep this number low.
ARRAY-COMPARATIVE GENOMIC HYBRIDIZATION ANALYSIS
AS A VALUABLE APPROACH IN MOLECULAR DIAGNOSTIC
OF PRIMARY COLORECTAL ADENOCARCINOMAS

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Keywords. Colorectal cancer, aCGH, chromosomal instability.

Introduction. Colorectal cancer (CRC) is the third leading cause of death related to cancer worldwide. Tumorigenesis for CRC is a multistep process including the accumulation of genetic and epigenetic alterations that occur during the normal-to-cancer sequence. The loss of genomic stability is a crucial molecular step and it is mainly caused by chromosomal instability. Modern high throughput technology that allows a comprehensive genome-wide analysis might be very helpful in the elucidation of these mechanisms.

Aim. The aim of the present study was to use an array-comparative genomic hybridization method (aCGH) to assess chromosomal aberrations in primary colorectal tumours.

Materials and methods. 35 patients treated due to colorectal adenocarcinomas were selected for aCGH–based study. All of the case samples were obtained intraoperatively from IV– staged CRC patients. As a control we used normal colon mucosa. The study group included patients in the range of 37–50 years. Only cancer cells–rich specimens (> 90 %) were used to further analysis. DNA was isolated using a DNeasy Blood & Tissue Kit (Qiagen) according to manufacturer’s protocol. Whole–genome chromosomal aberrations were identified with aCGH method using Sure Print G3 Human CGH 8x60K Oligo Microarrays that were analyzed through a high–resolution scanner G2505C. Row fluorescent data were extracted using Feature Extraction Software v.12.0. Chromosomal alterations were identified with a Cytogenomics v.3.0 Software (all products from Agilent Technologies).

Results. The vast majority of the examined CRCs demonstrated numerous chromosomal abnormalities including losses in 3p, 4q, 5p, 6q, 8p, 10q, 11q, 13q, 14q, 17q, 17p, 18q, 18p, 20q, 20p and gains in 11q, 13q, 13p, 17q, 20q, 20p. We observed frequently loss or gain of a whole chromosomal arm. The most common change detected in malignancy lesions was a loss of 16p11.1. In one primary CRC, we observed no chromosomal aberrations.

Conclusion. Obtained results suggest that significant genome instability is characteristic for advanced CRCs, although chromosomal stable colorectal cancers exist. Assessment of the chromosomal abnormalities common for primary CRCs may be useful to identify new disease–related genes.
NEUTROPHIL-TO-LYMPHOCYTE RATIO AS A BIOMARKER OF SPREAD AND INVASION OF PANCREATIC DUCTAL ADENOCARCINOMA

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Keywords. Neutrophil-to-lymphocyte ratio, pancreatic ductal adenocarcinoma.

Introduction. Pancreatic ductal adenocarcinoma (PDAC) is well-known for its dismal prognosis. In the general cancer statistics, it ranks only 12th by incidence, but represents the third most common cause of cancer-related mortality (SEER18; 2007–2013) urging to search for additional biomarkers. Recently, the association between systemic inflammatory reaction (SIR), reflected by neutrophil-to-lymphocyte ratio (NLR), and survival of surgically treated PDAC patients has been confirmed. However, inflammatory response varies by ethnicity. In addition, controversies exist regarding association between NLR and tumour burden by TNM.

Aim. The aim of the present study was to evaluate association between preoperative NLR and PDAC spread and invasion in surgically treated patients.

Materials and methods. Consecutive, morphologically confirmed PDACs, subjected to radical surgical treatment, were retrospectively identified by archive search in a single university hospital (2007–2015). Patients who had palliative surgery, lacked morphological evidence of the diagnosis or preoperative full blood count, or were affected by tumour of another histogenesis, were excluded. Preoperative whole blood counts were used to calculate NLR. Protocol approach was applied to assess pTNM, tumour grade (G), resection line status (R), manifestations of invasive growth. Descriptive and analytical statistics (Mann-Whitney test, Spearman’s rank correlation) was performed by SPSS software. Significance was considered with p < 0.05.

Results. The study group comprised 68 cases at the mean age of 62.2 years (confidence interval: 60.0–65.2). Males constituted 47.1% (35.2–58.3), females: 52.9% (41.7–64.8) of patients. The mean NLR was 4.27 (3.24–5.63). Large, advanced PDACs predominated: pT3 in 98.5% (95.4–100.0) cases; characterised by mean size of 3.5 cm (3.2–3.8); > 3 cm in 64.4% (51.7–76.7) of patients. pN1 was found in 73.1% (62.1–82.8), and R1: 50.7 % (39.1–63.1) of cases. There was statistically significant correlation between preoperative NLR and number of lymph nodes affected by metastases (p = 0.032) as well as intraneural invasion (p = 0.031). No significant associations were found between preoperative NLR and pT, N, G, R or largest tumour diameter.

Conclusion. In surgically treated PDAC, preoperative NLR shows statistically significant association with cancer invasion reflected by intraneural growth, and spread, reflected by number of metastases in regional lymph nodes. NLR is not associated with tumour size or grade. To the best of our knowledge, this is the first study devoted to SIR in PDAC patients in Latvia. Further research is necessary to confirm the present results.
PLATELET-TO-LYMPHOCYTE RATIO IN RELATION TO CANCER BURDEN AND MOLECULAR CHARACTERISTICS OF SURGICALLY TREATED PANCREATIC DUCTAL ADENOCARCINOMA

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Introduction. Regarding prognosis, pancreatic ductal adenocarcinoma (PDAC) represents an unsolved problem in oncology. In the general cancer statistics, PDAC ranks only 12th by incidence, but represents the third most common cause of cancer-related mortality (SEER18, 2007–2013) urging to search for additional biomarkers. Recently, platelet-to-lymphocyte ratio (PLR) has been reported as a prognostic factor for clinical outcome in PDAC patients. It is still unclear whether platelet activation is influenced by tumour itself or represents an independent reaction.

Aim. The aim of this study was to evaluate association between preoperative PLR and burden (by pTNM) as well as molecular characteristics of surgically treated PDAC.

Materials and methods. Consecutive cases of morphologically confirmed PDAC, subjected to radical surgical treatment, were retrospectively identified by archive search in a single university hospital (2007–2015). Patients who had palliative surgery, lacked either morphological evidence of the diagnosis or preoperative full blood count, or were affected by tumour of another histogenesis, were excluded from the study. Preoperative whole blood counts were used to calculate PLR. Protocol approach was systematically applied to assess tumour morphology including pTNM, cancer grade (G), resection line status (R), manifestations of invasive growth. Immunohistochemical visualisation was used to detect expression of vimentin, CD44, E-cadherin and cytokeratins (CK) 34betaE12, 19 and 20. SPSS software was applied for descriptive and analytical statistics by Mann-Whitney test and Spearman’s rank correlation. Differences were considered significant if p < 0.05.

Results. The study group comprised 68 patients at the mean age of 62.2 years (confidence interval: 60.0–65.2). The gender composition was following: males, 47.1 % (35.2–58.3), females, 52.9 % (41.7–64.8). The mean PLR was 171.15 (150.48–194.40). Large, advanced PDACs predominated, having the mean size of 3.5 (3.2–3.8) cm; exceeding the size of 3 cm in 64.4 % (51.7–76.7) and reaching pT3 in 98.5 % (95.4–100.0) of patients. In addition, pN1 was found in 73.1 % (62.1–82.8) and pR1 in 50.7 % (39.1–63.1) of cases. There was statistically significant correlation between preoperative PLR and CK19 (p = 0.031; r = 0.334). Preoperative PLR lacked statistically significant associations with tumour morphology (pN, pG, pR, diameter, invasiveness) and other molecular markers including CD44, E-cadherin and cytokeratins (CK) 34betaE12, 19 and 20.

Conclusion. In a cohort of surgically treated PDACs, higher CK19 expression is associated with higher preoperative PLR. Preoperative PLR has no correlation with tumour burden, including size, pT, pN, pG and pR parameters. Further research is mandatory to confirm the results of the pilot study. However, our data are more consistent with independent role of PLR suggesting high importance of this easily available novel biomarker.
CNV OF BREAST CANCER IN TRASTUZUMAB RECEIVING WOMEN

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Keywords. Breast cancer, HER2/ERBB2 Gene, CNV, Trastuzumab.

Introduction. Breast cancer is the most common cancer in women, with an annual mortality rate of 32.7 per 100 in Latvia. Around 30% of women with the ICD diagnosis C-50 show an overexpression for the human epidermal growth factor receptor (HER2) which is also used as a prognostic tool as it is associated with increased aggressiveness and lower disease-free time. Commonly overexpression’s are identified using immunohistochemistry (IHC) which detects HER2 on a protein expression level. Those identified patients are further treated with Trastuzumab (Herceptin) in addition to their chemotherapy to achieve cell cycle arrest but limiting the effect to that only 30% of treated patients seem to respond adequate to the treatment.

Aim. To identify CNV of ERBB2 and co-amplified regions in patients with Trastuzumab treatment.

Materials and methods. Fresh frozen tissue biopsies of 62 consented women who have donated their samples between 2011 until 2015 and had the confirmed diagnosis C-50 / breast cancer with Immunohistochemistry proofed HER2 amplification were involved in the study. Seven patients with the same criteria but a HER2-negative diagnosis have also been included as controls. DNA was isolated using the QIAamp DNA Mini Kit (Qiagen). 53 samples which yielded more than 50 ng/µL, measured with NanoQuant plate Infinite M200 Pro Monochromator (Tecan) have been further processed. CNV was detected using array-SNP HumanCytoSNP-12 v2.1 BeadChip Kit with ~300,000 SNP’s (Illumina) according to the manufacturers protocol, genotyping was than performed for 53 HER2+ samples and 7 HER2- samples on BeadArray Reader HiScan (Illumina). Quantitative data was visualised and analysed using Genome Studio as well as R program and Bioconductor. Samples were examined for amplification in ERBB2 gene region in the q-arm of chromosome 17 region as well as other copy number variation similarities.

Results. Out of 53 samples only 22 (41%) showed a amplification in the ERBB2 gene region. Out of 7 samples with no assumed amplification, 6 showed no amplification of ERBB2 gene region, but one CNV was detected. Furthermore, 20 of those true Her 2 positive samples share genomic characteristic identified regions, so far, are NOS2 gene and NLK both on 17q11.2. Chromothripsis was detected in 23% of HER2 + (5/22) and 10% of HER2 – (3/31) samples.

Conclusion. This study outlines a high rate of false positive (61% in HER 2 + group) and also false negative (14% in HER 2 – group) rate. Chromothripsis is twice as likely to occur in true HER 2 positive patients.
THE EVALUATION OF HGF, HOXB3, NESTIN, TGF-Β1, SHH, VEGF IN THE LUNG TISSUE OF INFANTS WITH BRONCHOPULMONARY DYSPLASIA

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Keywords. HGF, HOXB3, Nestin, TGF-Β1, Shh, VEGF, bronchopulmonary dysplasia, immunohistochemistry.

Introduction. Bronchopulmonary dysplasia (BPD) is a form of chronic lung disease with impaired final alveolarization and alveolar growth. Homeobox protein B3 (HOXB3) gene encodes transcription factors in embryogenesis. Hepatocyte growth factor (HGF) and transforming growth factor beta 1 (TGF-Β1) are multifunctional signaling cytokines with wide spectrum of functions. Nestin and sonic hedgehog (Shh) are proteins with extensive regulatory role in organogenesis. Vascular endothelial growth factor (VEGF) is a signal protein produced by epithelial and endothelial cells that regulates angiogenesis.

Aim. To evaluate HGF, HOXB3, Nestin, TGF-Β1, Shh, VEGF in the lung tissue of infants with BPD.

Materials and Methods. Lung tissue material was acquired during the autopsy from 9 infants aged 1 day to 261 days with BPD. Tissue specimens were obtained from RSU AAI historical tissue material collection. Routine histological staining with hematoxylin and eosin was performed. HGF, HOXB3, Nestin, TGF-Β1, Shh and VEGF were detected in lung tissue sections by use of biotin-streptavidin immunohistochemistry method. The numbers of immunoreactive cells were evaluated semi-quantitatively.

Results. Overall, we found higher numbers of HOXB3, VEGF and TGF-Β1 immunoreactive cells mostly ranging from few (+) to abundance (++++); moreover, lower numbers of HGF, Nestin and Shh immunoreactive cells were counted ranging mostly from occasional (0/+) to numerous (+++). In summary, mostly numerous (+++) immunoreactive cells were detected in epithelium, connective tissue and cartilage of bronchi and bronchioles; however, mostly few (+) immunoreactive cells were found in lung alveoli. We determined multiple statistically significant strong positive correlations (p < 0.05, r S ≥ 0.7) between the numbers of HGF immunoreactive cells regardless of certain location; moreover, wide codependency was discerned. Statistically significant (p < 0.05) strong positive correlations between the findings of HOXB3 (r S ≥ 0.7), Nestin (r S ≥ 0.7) and Shh (0.9 > r S ≥ 0.7) positive cells in epithelium of bronchial and alveolar tree were calculated. Furthermore, we determined strong positive (p < 0.05, r ≥ 0.7) correlations between the numbers of positive endothelial cells and epithelium.

Conclusions. The main source of HGF, HOXB3, Nestin, TGF-Β1, Shh, and VEGF is bronchial and alveolar tree epithelium. Overall, less HGF, HOXB3, Nestin, TGF-Β1, Shh, VEGF immunoreactive cells in pulmonary alveoli suggest deficiency of these factors in BPD, thus indicating their involvement in the growth and maturation of the lungs.
THE VALUE OF 4D CT STEREOTACTIC TREATMENT PLANNING TECHNIQUE

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Keywords. 4D CT, 3D CT, stereotactic treatment, non-small cell lung cancer.

Introduction. The main goals of radiotherapy are: to define and plan the volume of object as precisely as possible, to distribute irradiation evenly and to maximally protect healthy tissues. Particular problems arise when it is necessary to irradiate physiologically moving organs, such as lungs. The patient is not always able to withstand breathing during the whole irradiation. Imobilisation of the tumour is not possible during the respiratory phase, and when it is in motion, it can “decay” beyond the limits of the planned irradiation volume. the usual amount of irradiation volume used in 3D technology, which is quite large, and involve more healthy tissues and organs. Four-dimensional 4D radiotherapy is the explicit inclusion of the temporal changes in anatomy during the imaging, planning, and delivery of radiotherapy. Dose calculations for lung cancer radiotherapy have been technically feasible for a number of years but had not become standard clinical practice.

Aim. The purpose of our work, the essence of which is to compare the current practice of 3D CT-radiation therapy planning technique and the newly introduced 4D CT design technique, and to assess how the planned irradiation volumes are different in each case. Therefore, the purpose of this study was to determine if clinically significant differences in tumour control probability (TCP) exist between 3D and 4D dose calculations so as to inform the decision whether 4D dose calculations should be used routinely for treatment planning.

Materials and methods. The study was carried out using data of 2016–2017 from National Cancer Institute (Lithuania). Results of 3D and 4D CT scan were analysed from eleven consecutive findings with non-small cell lung tumours. Scan consisting of a series of 4D CT image sets acquired at different respiratory phases was used for treatment planning. Statistical analysis was performed by using SPSS software version 23, for statistical reliability to check the use of 2 test and t-test for independent samples. Selected statistical significance level of p < 0.05.

Results. The final research group included 11 patients. The mean age of patients was 65 ± 10.7 years. These patients have stage I–III non-small cell lung cancer (adenocarcinoma, platelet carcinoma of the lungs (G2–G3), 3D KT CTV median – 378.71 cm², median CTV equivalent spherical level – 7.27 cm, 4D KT CTV median – 190,70 cm², the median plane of the equivalent plane of the CTV is 5.75 cm. The median of the 3D CT PTV is 586.83 cm², the median of the PTV equivalent spherical level is 10.07 cm, the median of the 4D KT PTV is 409.21 cm², the PTV equivalent spherical level Median – 8.03.

Conclusion. Applying the 4D CT stereotactic treatment planning technique, were calculated a significantly lower CTV, which affects the size of the final target volume of the irradiated target (PTV). Using a 4D CT stereotactic treatment planning technique for the treatment of lung cancer, were calculated a significantly lower volume of irradiated target (PTV). With less volume of the irradiated target, we will contract less healthy tissues and we will be able to give a more radical irradiation dose.
HISTOPATHOLOGICAL AND CLINICAL CHARACTERISTICS OF BREAST INVASIVE DUCTAL CARCINOMA

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Keywords. Invasive breast ductal carcinoma, desmoplastic response, peritumoural inflammatory cells.

Introduction. Invasive breast carcinoma is the most commonly diagnosed malignant neoplastic disease in women in Latvia and worldwide. Previous histopathological, molecular and genetic studies have already demonstrated heterogeneous subtypes of breast carcinoma with different disease progression, response to treatment and patient outcome. Therefore, the understanding of the tumour characteristics and their association with clinical behaviour of breast carcinoma is of particular importance to improve patient treatment and outcome.

Aim. The aim of our study was to evaluate the relationship between conventional histopathological tumour characteristics (desmoplastic response, peritumoural inflammatory cells, lymphatic vessel invasion) and clinical characteristics of breast invasive ductal carcinoma.

Materials and methods. 69 patients undergoing breast surgery at Riga East Clinical University Hospital during 2010–2015 were enrolled in the study. The clinical and morphological data were collected and analyzed. Results were expressed as mean ± SD. H&E stained slides of the tumour were reexamined to assess desmoplastic response, peritumoural inflammatory cells and lymphatic vessel invasion by tumour cells. Desmoplastic response and peritumoural inflammatory cells were assessed semi-quantitatively by three-tiered scoring system. IBM SPSS 22.0 software was used for statistical analysis by Spearman’s rank correlation ($r_s$). P value < 0.05 was considered as statistically significant.

Results. Obtained results showed that the mean age of the patients was 57.1 ± 12.2 years; all 69 patients were women. A weak positive correlation was found between tumour grade and peritumoural inflammatory cells ($r_s = +0.27; p = 0.03$). Furthermore, a negative correlation was observed between lymphatic vessel invasion by tumour cells and peritumoural inflammatory cells ($r_s = −0.43; p < 0.001$). However, statistically significant correlations were not demonstrated between TNM stage and desmoplastic response, lymphatic vessel invasion and peritumoural inflammatory cells.

Conclusion. The increased numbers of peritumoural inflammatory cells are associated with increased tumour grade and lack of lymphatic vessel invasion. Further studies are essential to demonstrate impact of these findings on patient clinical outcome.
CLINICAL AND MOLECULAR FEATURES OF THE PATIENTS WITH 46,XY DISORDERS OF SEX DEVELOPMENT IN LATVIA

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Keywords. 46,XY disorders of sex development, Swyer syndrome, Complete androgen insensitivity syndrome

Introduction. 46,XY disorders of sex development (DSD) is a rare (6.4:100,000) clinical condition that is characterized by a female phenotype and a karyotype 46,XY. The most frequent causes of 46,XY DSD are complete androgen insensitivity syndrome (CAIS, 50–60 % of all the cases) and Swyer syndrome (SS, 20–30 % of all the cases). Mutations in sex-determining region Y (SRY) gene may be found in approximately 15–20 % of patients with SS. In case of CAIS pathogenic variants are discovered in androgen receptor coding gene (AR) in 65–95 % of cases. The molecular methods of diagnostics for SS and CAIS have not been available up to this time in Latvia, that is why we have not had any data about the genotype of SS and CAIS patients in the Latvian population.

Aim. To study clinical and molecular features of the patients with 46,XY disorders of sex development in Latvia.

Materials and methods. From 1997 to 2017 in CCUH cytogenetics database 44 patients with 46,XY DSD diagnosis were registered. Medical records were available for 19 of them and nine patients agreed for DNA molecular analysis. To confirm the diagnosis molecularly, PCR and bidirectional automated Sanger sequencing of AR (NC_000023.11) and SRY (NC_000024.10) genes coding regions and exon/intron boundaries was performed.

Results. 16 out of 19 patients (84 %) have clinical diagnosis of SS and three (16 %) – CAIS. The median age at the moment of the diagnosis is 15 and 17 years for SS patients and CAIS patients respectively. Two patients (10.53 %) had malignant neoplasms in gonads at the time of diagnosis. 10 patients (52.63 %) had gonads extirpation surgeries, two (10.53 %) – refused the surgery. No data regarding surgery is available for other 7 (36.84 %) patients. Bidirectional sequencing of AR and SRY genes was performed for 9 patients (6 with SS and 3 with CAIS diagnosis). We have not found any pathogenic variations in patients with SS. Previously undescribed likely pathogenic mutations in AR gene were found in two of three patients with CAIS diagnosis – p.Phe805Cys and p.Cys560Gly respectively. Previously described pathogenic mutation p.Arg616His was found in the third patient with CAIS.

Conclusion. The molecular methods of diagnostics for patients with SS and CAIS were introduced into Latvia. SS is found more frequently than CAIS in the Latvian population. The diagnosis of CAIS was confirmed molecularly in three patients (100 %). Two previously undescribed likely pathogenic mutations (p.Phe805Cys and p.Cys560Gly) and one previously described pathogenic mutation (p.Arg616His) were found. Pathogenic variations or deletions in AR and SRY genes were not found in patients with SS in the study population.
MITOCHONDRIAL DNA AMOUNT IN AGE-RELATED MACULAR DEGENERATION PATIENTS

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Keywords. AMD, mtDNA, qPCR.

Introduction. Age-related macular degeneration (AMD) is a progressive eye disease that is the leading cause of blindness in elderly in developed countries. AMD is associated with multiple environmental and genetic factors, but age is the strongest risk factor. Although pathological mechanisms are not yet fully understood, evidence suggests that mitochondrial dysfunction has a key role in AMD development. Also, certain SNPs associated with mitochondrial DNA haplogroups are connected with AMD.

Aim. Our goal was to evaluate the relative amount of mitochondrial DNA in the blood samples of AMD patients in comparison with healthy individuals.

Material and Methods. The study included 19 patients with exudative form of AMD: 12 females and 7 males; an average age was 77.2 (58–94) years. The diagnosis of AMD was confirmed by macular ocular coherence tomography. Nineteen age- and sex-matched healthy individuals were used as a control group. Total DNA from patients’ peripheral blood was extracted using phenol-chloroform method. Quantitative real-time polymerase chain reaction (qPCR) with TaqMan probes was used to measure peripheral blood relative amount of mtDNA. Descriptive statistics using 95% confidence interval and t-test was performed using GraphPad Prism version 5 for Windows. p < 0.05 was considered statistically significant.

Results. The relative amount of mtDNA has been successfully measured in all DNA samples. The results showed that the relative amount of mtDNA was significantly higher in AMD patients’ group in comparison to the control group, p = 0.0231.

Conclusion. To our knowledge, this is the first time when relative amount of mtDNA was investigated in AMD patients. Elevation of mtDNA amount is often observed in eye disorders, and it can be concluded from this study that the amount of mtDNA is also higher in AMD patients in comparison to healthy individuals. Further studies are needed to confirm these findings.
EXPANDED CFTR GENE ANALYSIS IN PATIENTS WITH CFTR-RELATED DISORDERS IN LATVIA

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Keywords. Male infertility, exocrine pancreatic insufficiency, CFTR allelic variants.

Introduction. Cystic fibrosis transmembrane conductance regulator-related disorders (CFTRRD) are congenital bilateral absence of vas deferens, male infertility, acute recurrent or chronic pancreatitis and disseminated bronchiectasis. These conditions are caused by dysfunction of CFTR protein which is caused by different allelic variations in the CFTR gene. There are known population differences in CFTR variants and it is important to create specific variant detection algorithm in order to decrease expenses. In previous studies in population of Latvia there were found Slavic mutations in 4th and 13th exons of CFTR gene which are not included in genetic variant panels.

Aim. Analyse variations in the exon 13 (e. g. 2184insA, 2184delA, 2143delT and R668C) and exon 4 (e. g. R117H) of the CFTR gene among different CFTR-RD patient groups who are negative for dF508 variant – infertile males and patients with exocrine pancreatic insufficiency patients.

Materials and methods. In the study there were 2 groups of patients. The first group consisted of 94 infertile men. In the second group there were 18 patients (11 females, 7 males) who have exocrine pancreatic insufficiency and who are negative for 50 most common cystic fibrosis causing mutations in European populations. DNA was isolated from blood using standard methods. To analyse 4th and 13th exons in CFTR gene HRM method were used. Identified variations were confirmed with other method.

Results. In the infertile male patient group one patient was identified with variant R117H and one other patient with variant R668C. For male with R117H variant there was found one other variant and diagnose of CFTR-RD was confirmed. And in the second patient group with exocrine pancreatic insufficiency R668C variant was identified for one patient, that could be cause of the clinical status.

Conclusion. For patients with CFTR-RD in Latvian population should be used expanded panel of CFTR gene genetic variants.
SONIC HEDGEHOG SIGNALING IN PRIMARY AND RECURRENT BASAL CELL CARCINOMA

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Keywords. Basal cell carcinoma; sonic hedgehog signaling, immunohistochemistry.

Introduction. Basal cell carcinoma (BCC) is the most commonly diagnosed malignant cutaneous tumour in white race (more often Caucasians). It is slow growing tumour despite it high mitotic rate. Clinically, BCC appears as flesh or pink colored pearly papules found in the head or neck region (85 % of cases). These tumours need months or years, in rare cases decades, to increase the size twice. Conversely, recurrent BCC can increase their size in shorter period of time. BCC relapses are observed 20–40 % of cases. Sonic hedgehog (Shh) pathway is an essential regulator of cell proliferation and differentiation during embryogenesis. Activation of Shh pathway often leads to tumorigenesis in general, and BCC, in particular.

Aim. This study aimed to evaluate peculiarities of Shh signaling implicated in development of primary and recurrent BCC assessed using immunohistochemistry.

Materials and methods. BCC materials were obtained during craniofacial surgeries. Formalin-fixed and paraffin-embedded tissues were sectioned and stained immunohistochemically with anti-Shh antibody. Semiquantitative estimation of samples in 20 randomly selected microscopic fields was applied. Expression of Shh was scored as follows: 0, 1, 2 and 3 (0 – 0 %, 1 – 0–10 %, 2 – 10–75 % and 3 – > 75 %), respectively, and tumour and stromal expressions were estimated separately. Statistical analysis was performed using SPSS 22.0 programme and tissue samples were analysed using Leica microscope (x 400).

Results. Statistically higher stromal expression was evident in recurrent BCC, where Shh immunopositivity was up to 58.3 %, conversely, Shh expression in primary BCC was only 19.3 %. Moreover, both types of BCC, namely primary and recurrent tumours demonstrated mostly a low percentage of Shh-positive cells graded as “1” – 15 and 29.2 % respectively. Higher expression grade estimated as “3” was more frequent in recurrent BCC (up to 16.8 %) whereas in primary BCC up to 0.7 % only. A moderately expressed marker presented in recurrent and primary BCC is 18.3 and 3.6 %, accordingly.

Conclusion. The presence of a high-level stromal expression suggests on possible paracrine communication and involvement of it in the development of relapse via the Shh pathway. Inhibition of this paracrine signaling can be effective in treatment of primary and recurrent BCC.
SIGNIFICANT PHENOTYPIC AND QUANTITATIVE ALTERATIONS OF BLOOD CELLS IN CHILDREN WITH INFECTIOUS MONONUCLEOSIS, DETECTED BY ROUTINE FLOW CYTOMETRY

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Keywords. Lymphocyte subpopulations, Flow cytometry, Infectious mononucleosis, Childhood infections, Immunology

Introduction. Evaluation of lymphocyte (LYM) populations: T (including T4 and T8), B and NK cells is a routine screening for immune deficiencies (ID); multicolor flow cytometry (FC) is the method of choice. Standardized 6-color reagents allow detection of additional populations.

Infectious mononucleosis (MN) is a viral (usually EBV) infection typical for children and adolescents, with proliferation of atypical T8 cells. LYM subpopulation test is rarely done in MN, though some cases present with signs of acquired ID.

Aim. The aim was to investigate if the striking cell atypia in pediatric MN is reflected by changes of LYM subsets and expression of LYM antigens.

Materials and methods. 23 EBV-related MN samples tested by BD FacsCanto II flow cytometer and IVD 6-TBNK kit were retrospectively found in 2014–2016 FC files of Children’s University Hospital (Riga). Normal 243 age and gender-matched tests were used as controls.

DP cells were the main population (52% LYM) in one case, it was excluded. The rest test files were exported into INFINICYT software (Cytognos), merged and analyzed; the results were uploaded to MS Excel. Statistical analysis was performed by IBM SPSS v23 (Mann-Whitney U). All LYM, main subpopulations (T, T4, T8, B and NK) and additional populations (CD4-CD8– double negative – DN, CD4+ CD8+ double positive – DP T-cells and CD8+ NK – NK8) were assessed. Percentages from WBC and LYM were calculated. Median fluorescence intensity (MFI) that defines antigen density on membrane and CV that reflects the expression heterogeneity were estimated for the kit antigens CD3, CD16+56, CD45, CD4, CD19, CD8 and for optical parameters FSC (cell size) and SSC (complexity of cell structure).

Results. As expected, percentage of LYM, T and T8 cells was significantly increased and T4 and B cells decreased; NK count was similar. In addition, the study revealed significant increase of DP and decrease of NK8 cells. CD45 MFI was significantly decreased with increased CV in MN cases in all studied populations, CD3 was decreased in T, T4, T8 and DP cells, CD4 in T4 and DP cells, CD8 in T8 and NK8 cells, CD16+56 in NK and NK8 cells. SSC was significantly increased in all studied populations, except NK.

Conclusions. As expected, the atypical cells were CD8+ with high SSC. The study revealed other significant disproportions, including less studied populations. Of interest is the new data on the appearance of DP cells that are usually very few in normal samples. One patient demonstrated that in rare cases DP cells could constitute the main proliferating population.

Unexpectedly, the expression of most lymphoid antigens was decreased, that could be a result of cell immaturity and/or activation. Simultaneously, phenotypic heterogeneity (by fluorescence CV) was increased. The finding is novel.

Due to selection criteria, the cohort is not completely representative. A larger prospective study would be necessary to confirm the findings.
DETECTION OF PGP 9.5, SUBSTANCE P, VIP, CGRP, MYELIN AND NGF IN CLEFT AFFECTED MUCOSA OF THE LIP

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Keywords. Orofacial defects, PGP 9.5, substance P, VIP, CGRP, myelin, NFG.

Introduction. Orofacial clefts are one of the most common defects present at birth with multifactorial heredity and partly understood morphopathogenesis. On average it affects 1 in 700–800 children born in Latvia (RSU Institute of Stomatology).

Aim. The aim of the study was to evaluate the presence of protein gene product 9.5 (PGP 9.5), substance P, vasoactive intestinal peptide (VIP), calcitonin gene related peptide (CGRP), myelin and nerve growth factor (NGF) in cleft affected mucosa of the lip.

Materials and methods. Lip mucosa tissue samples were obtained during surgical lip correction from seven 2 to 6 months old children. Prepared tissue sections were stained by immunohistochemistry for PGP 9.5, substance P, VIP, CGRP, myelin and NGF. The intensity of staining was graded semiquantitatively. To obtain statistical data we used non-parametric statistics – Spearman’s rank correlation coefficient was calculated.

Results. On average immunoreactivity of all studied markers except for substance P was more prominent in subepithelial tissue compared to epithelium. Mainly moderate (++) to numerous (+++) structures in the visual field of cleft affected epithelium contained PGP 9.5, VIP, myelin and NGF, meanwhile, similar immunoreactivity in subepithelial tissue was found for PGP 9.5, substance P and NGF. Mostly numerous (+++) structures in the visual field contained substance P in epithelium and CGRP both in epithelium, as well as in subepithelial tissue. We also observed mainly numerous (+++) to abundance (+++++) of VIP and myelin positive structures in the visual field in subepithelial tissue of cleft affected patients. Very strong statistically significant positive correlation was found between PGP 9.5 and CGRP (R = 0.843, p = 0.017) in epithelium and between VIP and CGRP (R = 0.924, p = 0.003) in subepithelial tissue. Strong statistically significant positive correlation was found between PGP 9.5 and NGF (R = 0.770, p = 0.043) in subepithelial tissue. Lastly, very strong statistically significant negative correlation was detected between PGP 9.5 and substance P (R = −0.825, p = 0.022) and between CGRP and substance P (R = −0.870, p = 0.011) in epithelium.

Conclusion. PGP 9.5, substance P, VIP, CGRP, myelin and NGF are present both in impaired epithelia, as well as subepithelial tissue of cleft affected lip mucosa and possibly play a role in the morphopathogenesis of cleft formation. The presence of each marker found in epithelium and subepithelial tissue slightly differs from patient to patient.
EXPRESSION OF HUMAN PARVOVIRUS B19 PROTEINS:
POSSIBLE PATHOGENICITY IN CASE OF
CONTACT DERMATITIS

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Keywords. Human parvovirus B19, endothelial involvement, contact dermatitis, immunohistochemistry.

Introduction. Human parvovirus B19 (B19) has a tropism for cell types which express at their surface the main receptor for B19 – P blood group antigen. These cells are – erythroid progenitor cells, endothelium, megakaryocytes, fetal myocytes and placental trophoblast cells. The role of B19 has been implicated in about 40 dermatological conditions. Contact dermatitis is an inflammatory response reaction caused by skin exposure to noxious agents. Depending on these agents contact dermatitis can be divided into irritant (ICD) and allergic (ACD) types. The presence of B19 viral proteins in patients with contact dermatitis and their possible association with the disease has never been studied before.

Aim. The aim of this study was to investigate the presence of expression of B19 in the skin, its distribution and possible pathogenic role in case of contact dermatitis.

Materials and methods. Cutaneous punch biopsies were obtained from sixteen patients with diagnosed ACD and ICD relying on the patch testing. The presence of B19 genome sequence was detected by nested PCR in the skin samples DNA. Immunohistochemistry was performed conventionally using monoclonal mouse anti-human B19 antibody (1:100), which labels B19 VP1 and VP2 proteins. The amplification of the primary antibody and visualization of reaction products were performed applying the HiDef Detection HRP Polymer system and diaminobenzidine tetrahydrochloride substrate kit. The viral antigen expression in the endothelium, eccrine glands and sebaceous glands was estimated semiquantitatively: 0 – absent; 0/1 – absent to weak; 1 – weak; 1/2 – weak to moderate; 2 – moderate; 2/3 – moderate to strong; 3 – strong. For validation of immunohistochemical results confocal immunofluorescence microscopy was performed.

Results. Histopathologically, spongiotic dermatitis characterized by impairment of cohesion of epidermal keratinocytes resulting in epidermal edema and intraepidermal micro- and macrovacuolization was commonly found. Vacuolar damage of the keratinocytes sometimes manifested by the local rupture of the basal membrane was fixed in 2 samples. Perivascular and periductal inflammatory infiltrates presented by lymphocytes and some occasional neutrophils were detected along with endothelial swelling. One biopsy sample presented with inflammatory infiltrate surrounding the sebaceous gland. Inflammatory infiltrates revealed predominantly a lichenoid pattern. Some biopsies demonstrated lymphocytic exocytosis into the epidermis, mostly into the basal and spinous layers. Mild subcorneal accumulations of granulocytes were detected as well. Slight parakeratosis was found in one case. The presence of B19 genomic sequence was found in 8 of 16 skin tissues biopsies samples (50%), and patients were divided into 2 groups – PCR positive and PCR negative, respectively. Immunohistochemically, B19 expression was restricted to vascular endothelium and glands. In 2 patients from PCR positive group there was no vascular expression of B19 found. In 5 cases it was evaluated as a weak, and in 1 case as a strong, presented in the superficial and deep dermal vessels. One patient in PCR negative group revealed a weak
to moderate, whereas another one – a moderate to strong B19 endothelial expression. Moreover, vascular endothelial expression of B19 was not found in four other specimens from PCR negative group and it was weak in 2 patients from the same group. Additionally, all B19 positive vessels were surrounded by inflammatory infiltrates. Strong B19 labelling of the sebaceous and eccrine glands was demonstrated in all samples obtained from both, positive and negative PCR groups. 

**Conclusion.** The histopathological findings comply with ACD and ICD diagnoses in its acute manifestations. The presence of B19 in the endothelial cells which are surrounded by inflammatory cells infiltrates along with endothelial swelling and edema of the superficial dermis suggests on the vascular damage and increased permeability of the dermal capillaries.

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**ASSESSMENT OF PRESENCE OF HUMAN HERPES VIRUS 7 IN SYNOVIAL MEMBRANE OF INDIVIDUALS WITH CHRONIC ARTHRITIS**

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**Keywords.** Chronic arthritis; human herpes virus 7, synovial membrane, immunohistochemistry.

**Introduction.** Chronic arthritis may reveal multiple features including – destructive, inflammatory or even autoimmune basis. It is consistently reported that among enviromental factors, which contribute to the pathogenesis of chronic arthritis, infectious agents could play a certain role. Currently, it is reported that bacterial agents such as *E. Coli* and viral agents such as parvovirus B19, human herpes virus 6 and Epstein-Barr virus worsen manifestation of the disease. However, human herpes virus 7 (HHV-7) and its influence on chronic arthritis pathogenesis is studied rather poorly, it also accounts for a major portion of disease causation as far as it could be found in the blood and synovial tissue of individuals, who are diagnosed with chronic joint disease.

**Aim.** The aim of this study was to evaluate the presence of HHV-7 proteins in synovial membrane of patients with chronic joint disease.

**Materials and methods.** Materials were obtained during joint replacement surgeries specifically from HHV-7 PCR positive patients selected by use of molecular virology. Formaline fixed and paraffin embedded synovial membrane tissues were sectioned and stained immunohistochemically with anti-HHV-7 monoclonal antibody. HHV-7 positive cells were estimated quantitively in 10 randomly selected vision fields of each slide. The results were analyzed using SPSS 23.0 programme. Data were presented as medians with interquartile range (IQR (25%; 75%).

**Results.** Expression of HHV-7 antigen within synovial membrane was demonstrated in sublining lymphocytes, plasmocytes, macrophages and endotheliocytes, but not within the superficial layer. Statistically higher numbers (p < 0.001) of HHV-7 positive sublining lymphocytes (3.5 (1.75; 8.25)) compared with HHV-7 positive plasmocytes (1.0 (0.0; 2.0)), endotheliocytes (1.5 (0.0; 4.00)) and macrophages (0.0 (0.0; 1.0)) were found.

**Conclusion.** Detection of expression of HHV-7 within synovial membrane of chronic arthritis patients suggests on a role of this infectious agent in pathogenesis of arthritis. The virus predominantly affects lymphocytes, which are the cells basically implicated in the pathogenesis of chronic arthritis.
LOCALIZED SCLERODERMA AND SYSTEMIC SCLEROSIS – HISTOPATHOLOGICAL FEATURES SEEN IN SKIN BIOPSIES IN CHILDREN’S CLINICAL UNIVERSITY HOSPITAL, LATVIA

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Keywords. Scleroderma, systemic sclerosis, pathology.

Introduction. Major fibrosing connective tissue disorders (CTDs) of the skin are: localized scleroderma and systemic sclerosis (SSc). SSc is a multi system autoimmune disorder characterized by fibrosis in skin and internal organs. Localized scleroderma is an autoimmune inflammatory sclerosing disorder. Localized scleroderma is 10 times more frequent in children than pediatric SSc.

Aim. I sought to gather and analyze data about histopathological features of localized scleroderma and SSc seen in skin biopsies in Children’s Clinical University Hospital (CCUH), Latvia.

Materials and methods. I looked through a total of 5982 histopathological descriptions of the skin biopsies from the time period of August 1, 2013 till October 31, 2017 using the CCUH system “Dialab” in order to find descriptions containing the word “scleroderma”. Information about the patient’s gender, age, date when biopsy was taken, type of biopsy and histological patterns seen in biopsy were gathered. Then the additional information about each patient was found using the CCUH system “Andromeda”. Statistical analysis was performed using IBM SPSS Statistics 22. p value < 0.05 denoted the presence of a statistically significant difference.

Results. Total of 55 descriptions (39 skin biopsies, 16 other biopsies) were analyzed. Demographic characteristics of these patients: 19 male, 36 female patients aged 11 ± 7 years (median ± interquartile range (IQR); range, 1–17 years). In 72.7% of the cases histopathological diagnosis matched the clinical diagnosis and in 20.0% of the cases it did not match the clinical diagnosis, and in 7.3% –diagnosis was not known. Top five histological features described were: perivascular lymphohistiocytic infiltrate in dermis 80.0% (95% CI: 69.4–90.6%), thick collagen fibers in hypodermal adipose tissue 50.9% (95% CI: 37.7–64.1%), dermal collagen fibers with thickened collagen bundles 49.1% (95% CI: 35.9–62.3%), epidermal hyperkeratosis 44.0% (95% CI: 27.1–53.0%), reticular dermis collagenized/sclerotic 36.4% (95% CI: 23.7–49.1%). However, no statistically significant differences (p < 0.05) were found between histological features and the clinical form of the disorder (localized scleroderma or SSc).

Conclusion. Pediatric skin biopsy is a useful tool to diagnose, exclude or alert clinicians of localized scleroderma, SSc and other CTDs. Despite the clinical differences between localized scleroderma and SSc, the histopathological features of skin biopsies are indistinguishable and both demonstrate a predominant perivascular lymphohistiocytic infiltrate in dermis.
DENSE ARTERY SIGN IN EARLY DIAGNOSTIC OF ACUTE STROKE AND ITS CORRELATION WITH NIHSS SCORES

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Keywords. Dense artery sign, computed tomography, NIHSS.

Introduction. One of the methods for confirming a stroke is computed tomography (CT). It is used in diagnostic of hyper-acute stroke by finding the so-called hyperdense artery, which indicates the presence of a thromboembolism in the affected artery. According to literature, this sign disappears on average within 12–24 h, leaving only visual changes in supplied brain territory. Considering that treatment of strokes caused by thromboembolisms is time limited and differs from that for strokes of other origins, early detection is crucial.

Aim. To determine the frequency of occurrence of the dense artery sign in CT scans of patients of acute stroke in carotid basin and its correlation with the clinical severity score, treatment method and outcome, using NIHSS scores.

Material and methods. Clinical and radiological data from 239 patients with acute ischemic stroke, admitted at Emergency Department of Riga East University Hospital between July 1 and December 1, 2017, were analysed. Anamnesis and NIHSS data from hospital information system and CT data from radiological server were used. For further study, surviving patients with acute stroke in carotid basin were selected. Non-contrast CT axial scans were analysed for presence of dense artery sign in the middle cerebral artery. Depending on its presence, the patients were divided into study and control groups. For all patients NIHSS data at admission and discharge were considered, and compared with the dense artery sign on CT.

Results. Dense artery sign was found on CT in 33 patients (study group), 21 of them were treated by interventional thrombectomy, 8 with thrombolytic therapy and 4 received conservative therapy. Out of 206 patients without visualised dense artery sign on CT (control group), interventional thrombectomy was done in 24, intravenous thrombolysis in 85, and conservative therapy in 97 cases. Comparing the clinical severity at admission, a statistically significant difference was found between patients with dense artery sign and those without it (p = 0.041). The clinical severity difference at discharge was not statistically significant, what indicates that for patients with positive dense artery sign, an intensive, radical treatment leads to higher positive treatment progress compared to control group (p = 0.033).

Conclusion. The dense artery sign in acute stroke on non-contrast CT is critically important radiological symptom for the most appropriate treatment selection. According to NIHSS, patients with positive dense artery sign initially have heavier clinical condition, but show more rapid improvement dynamic after intense treatment.
ESTIMATION OF MYOCARDIAL VOLUME IN THE HUMAN HEART BY REGRESSION ANALYSIS AND REVOLVING REGIONS

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Keywords. Modelling, myocardium volume, two variable regression analysis, revolving regions, Simpson’s rule.

Introduction. Myocardial volume and its affiliated indices, since being correlated to expelled blood volume during heart cycle are considered as very important markers of cardiac illnesses such as cardiomyopathy. Nuclear Magnetic Resonance (NMR) and echocardiography are applied to assess these myocardial parameters; given methods are based on the Simpson’s rule and prolate ellipsoid modelling. Simpson’s rule is complex to perform, but prolate ellipsoid modelling is only precise with hearts showing normal anatomy, therefore we have suggested an alternative method of myocardium volume estimation.

Aim. The aim of this study was to test empirically an alternative method of myocardial volume estimation based on regression analysis and volume by revolving regions.

Materials and methods. Laboratory of Anatomy of the Department of Morphology of Institute of Anatomy and Anthropology provided three human cadaver hearts. In this study a special device was designed, and it allowed to map X and Y coordinates of eight equidistanced points on myocardium as well as its thickness. This was done both frontally and sagittally in order to obtain three-dimensional parameters. Next, data were run on GeoGebra (2017) linear regression tool (sinus model), the equations simulating myocardium shape both internally and externally were obtained. Myocardium was divided into left atrium (LA), left ventricle (LV), right atrium (RA) and right ventricle (RV) on the basis of sinus equation intersection. For each of these regions revolving volumes were calculated using the Wolfram Alpha Computational Cloud Engine (Student PRO, 2017). Finally, data were adjusted to meet circumference of the analyzed region.

Results. For three human cadaver hearts LV myocardium volume was 110 ± 22 cm³, LA 40 ± 15 cm³, RV 98 ± 10 cm³ and RA 34 ± 15 cm³. The sum of average volumes was 282 cm³. Regression analysis gave three sinus equations when modeling the surface for inner and outer myocardium layers. On the XY plane areas enclosed between sinusoids were the following: LA 2.3 ± 0.4 cm², LV 7.25 ± 0.9 cm², RA 2.4 ± 0.2 cm², RV 6.87 ± 0.5 cm². LA and RA reported lower enclosed areas and rotational volumes; volume differed with LV:LA as 1:2.8 and RV:RA as 1:2.9. If ventricles compared, LV myocardial volume estimate was greater than RV by 11%. Increase in area enclosed contributed to the larger rotational volume. Myocardium thickness grew when moving towards apex from LA and RA, with the larger increase reported at LA.

Conclusion. Data compliancy for LV suggested this method be suitable for myocardial estimation. Average data for LV (Cain PA, 2007) were fully compliant with obtained values. Application of NMR and echocardiography for mapping may increase precision and efficiency, which is a basis for a further research.
MEASUREMENTS OF THE SURFACE AREA, SURFACE ENLARGEMENT AND GREY MATTER VOLUME OF THE CEREBRAL CORTEX

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Keywords. Cerebral cortex, surface area, surface enlargement, grey matter volume.

Introduction. Morphometrical traits of the cortex cerebri like surface area and thickness are associated with intelligence and may be changed in pathology.

Aim. The aim of the study is to determine the surface area, the surface enlargement by sulci and gyri and the volume of grey matter of the cortex cerebri and compare the results to reference values of literature and to compare both hemispheres regarding the measured traits.

Material and methods. The study was started with a literature review about morphometrical data of the cortex. The examination was performed on one male formalin fixed brain provided by the Laboratory of Anatomy of the Department of Morphology of Institute of Anatomy and Anthropology. After extraction and gross examination the brain was cut in 14 slices parallelly to the frontal plane. The thickness of 10 mm was achieved using a specially constructed cutting mold. The local enlargement was measured in high resolution pictures of the cut faces. The overall surface enlargement of the cortex was calculated as the weighted arithmetic mean of the local enlargements and weighted by the non-enlarged surface lines, the non-enlarged surface area times the overall surface enlargement.

For the volume of the grey matter the average thickness was measured for each slide and hemisphere, multiplied by the enlarged line and summed up by a definite integral. The digital measurements in the pictures were performed with Inkscape 0.91, the calculations with Microsoft Office Excel 2016 and integral-calculator.com.

Results. The overall cortical surface enlargement was 3.21 ± 0.41, the cortical or enlarged surface area was 1409 cm² and the nonenlarged surface area was 440 cm². The enlargements for the hemispheres were: left 3.20 ± 0.46, right 3.21 ± 0.42, their surface areas were: left 719 cm², right 690 cm². The average thickness of the cortex was 2.58 ± 0.06 mm. The volume of grey matter was 377 cm³: 196 cm³ in the left and 181 cm³ in the right hemisphere.

Conclusion. The calculated surface area, thickness and volume were in the same order of magnitude than the reference values from literature. While the surface enlargement was similar in both hemispheres, the left has 4% larger surface area and 8% higher volume than the right. The usage of the weighted arithmetic mean turned out to be practically irrelevant because of the relative homogenous distribution of the enlargement.
INFLUENCE OF AN ENTERIC OSMOTICALLY ACTIVE AGENT ON DIFFUSION WITHIN INTESTINAL WALL IN MAGNETIC RESONANCE ENTEROGRAPHY

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Keywords. Magnetic resonance enterography, diffusion weighted imaging, apparent diffusion coefficient, osmotically active agent.

Introduction. Crohn’s disease is a chronic impairing inflammatory bowel disorder with increasing prevalence requiring timely diagnostics to start the treatment as early as possible in order to avoid severe complications. Magnetic resonance enterography (MRE) is a radiology method of high soft tissue resolution using no ionizing radiation but requiring preparation with osmotically active enteric contrast agent and administration of gadolinium contrast medium which, according to multiple recent studies, makes deposits in brain tissues. Therefore, development of imaging techniques with potential to replace gadolinium contrast agent is important, and one of such techniques is diffusion weighted imaging (DWI). However, subjectively, the bowel wall signal intensity seems to vary depending on the presence or absence of the osmotically active agent in the bowel.

Aim. To evaluate whether the presence of osmotically active enteric contrast agent used in MRE affects diffusion of intestinal wall in diffusion weighted Imaging (DWI).

Materials and methods. 54 patients with no evidence of inflammatory bowel disease were included in the study. DWI apparent diffusion coefficient (ADC) values of intestine walls were measured before and after preparation with enteric contrast agent (Sol. mannitoli 2.5% 1–1.5 l). Measurements were grouped in following categories: b value (b = 600 s/mm², b = 800 s/mm²), localization (ascending colon, transverse colon, descending colon, sigmoid colon, rectum) and intestine filling (mannitol, feces, empty). Measured data were analyzed with t-test.

Results. Notable variations were found between DWI ADC values before and after preparation with mannitol contrast agent (p < 0.05). Higher ADC was measured in ascending colon; b = 600 before preparation 1.56 (SD 0.26) and after preparation with mannitol 2.48 (SD 0.59), but b = 800 before preparation 1.36 (SD 0.27) and after preparation with mannitol 2.10 (SD 0.44).

Conclusion. ADC value is higher in presence of mannitol, therefore diffusion within intestinal wall is influenced by presence of enteric osmotically active agent which should be taken into account when evaluating DWI ADC values for Crohn’s disease diagnosis.
HOSPITAL-ACQUIRED PNEUMONIA: STATISTICAL ANALYSIS IN CLINICAL CENTRE BĪKERNIEKI OF RIGA EAST CLINICAL UNIVERSITY HOSPITAL IN 2015–2017

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Keywords. Hospital-acquired pneumonia, radiology, localization, diagnosis, co-morbidities, treatment.

Introduction. Hospital-acquired pneumonia (HAP) defined as pneumonia occurring more than 48 hours after admission, not due to progression of disease process present at admission [1]. Being one of the most common healthcare–associated infection it needs to be prevented or early diagnosed and treated.

Aim. To collect and analyze cases with Hospital-acquired pneumonia diagnosis in Clinical Centre Bikernieki from January 2015 till November 2017.

Materials and methods. Retrospective clinical analysis of patient’s medical documentation was used for examination. The following data collected from documentation was: gender, age, days in hospital, hospitalization diagnosis, co-morbidities, radiological tests, pneumonia localization in lungs, HAP complications and antibiotics used for treatment. Data was analyzed and calculated using descriptive statistical methods in “Microsoft Excel 360” and “SPSS Statistics 24” programs.

Results. In total 104 patients (mean age 79 years) were eligible for the study. 37 men (mean age 76, with min age 42 and max 92, SD 12.6) and 67 women (mean age 81, with min age 54 and max 97, SD 9.4). Mean time spent in hospital was 12 days (min 4 days and max 47, SD 7.2). Most common hospitalization diagnosis was cardiovascular diseases – 31.7 % of cases (n = 33) neurological disorder – 24 % (n = 35) and respiratory system diseases – 21.2 % (n = 22). The most frequent co-morbidities were cardiovascular diseases – were present in 79.8 % of patients (n = 83), then neurological pathology – 62.5 % (n = 65) and nephrological diseases – 39 % (n = 41). 51 % (n = 53) of patients were diagnosed with X-ray, 16.3 % (n = 17) with CT scans and 32.7 % (n = 34) had both radiological tests. In 72.1 % cases (n = 75) pulmonary consolidation was unilateral and occurred in right lung in 40.4 % of cases (n = 42) and in left lung in 31.7 % (n = 33). 27.9 % (n = 29) pneumonia was bilateral. The most frequent complications were pleural effusion – 16.3 % of cases (n = 17) and intoxication in 5.8 % of cases (n = 6). In 56.7 % of cases (n = 59) HAP was treated with Ceftriaxone and for 19.2 % of patients (n = 20) was prescribed Amoxicillin/Clavulanic acid.

Conclusion. HAP in Clinical Centre Bikernieki has tendency to be more frequent in elderly female patients with cardiological co-morbidities and as a result, they had approximately a two-week hospital stay. The results are comparable to literature data in such categories as age, length of hospital stay, co-morbidities and prescribed antibiotics treatment.
HAND STRENGTH AND MOTOR PERFORMANCE IN RELATION TO 2D:4D FINGER RATIO (PILOT STUDY OF STUDENTS)

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Keywords. 2D:4D finger ratio, hand, motor performance, sex difference

Introduction. For humans, both digit length and digit ratio are sexually dimorphic. Males have relatively longer fourth finger (measured at palmar aspect). It is known that second to fourth digit ratio (2D:4D) might be an indicator for prenatal androgenisation, hence differences in strength and motor activity might be expected in hands with different finger ratios as well.

Aim. To establish sex related differences of hand grip strength and motor performance of young adults in relation to 2D:4D finger ratio.

Material and methods. In total 80 males and 70 females aged between 19–24 years were investigated. Length of fingers at the palmar aspect were measured by spreading calliper, hand grip strength – by spring-type mechanic hand-held dynamometer, motor performance – quickness (in seconds) of precise finger movements – was evaluated by peg-moving task using Annett PEGBOARD (1985). Three sub-groups of finger ratios (small, average, big) were composed with respect to Mean ± 1 SD (standard deviation) finger ratio for males or females. MS Excel and SPSS 23.0 software were used for data processing.

Results. Mean right/left hand’s 2D:4D ratio in females was 0.989/0.999 (p > 0.05) and in males – 0.983/0.983 (p > 0.05); sex differences were statistically significant in left hand (p < 0.05); Women with small 2D:4D ratio (evidently longer 4th finger) at both hands had greater hand strength (right/left) – 27.6KG/24.3KG, than those with big 2D:4D ratio (evidently longer 2nd finger) – 26.7KG/23.5KG, but differences between finger ratio groups were insignificant (p > 0.05/p > 0.05). Hand strength in men with much longer 4th finger at right/left hands was 45.48KG/41.6KG, whereas hand strength in males with evidently longer 2nd finger at right/left hands – 46.1KG/49.8KG, and differences between finger ratio groups were statistically significant in left hand (p < 0.05). Right/left hand average motor performance is 10.99 sec./11.51 sec. for women whose right hand’s 4th finger is longer and for those whose longer 2nd finger – 11.08 sec./11.68 sec. (p > 0.05). In men group with longer right/left hand’s 4th finger motor performance is 11.09 sec./11.69 sec.; with longer 2nd finger – 11.67 sec./11.71 sec. (p > 0.05).

Conclusions. 1. There was a tendency that hands were stronger and motor activity was faster in females with evidently longer 4th finger, therefore, it might be presumed that prenatal androgenization affected these females more evidently. 2. Surprisingly, men with evidently longer 4th finger had weaker hands, though they had faster motor activity at both hands (there was a tendency) than those with evidently longer 2nd finger. 3. Our previous study did show that 89.6 % of investigated students were right-handed, in addition, almost 40 % of males and only 10 % of females were training at gyms. Hence, it might be presumed, that female hands were less affected by physical load, and it is necessary to check the influence of physical training on males’ hand strength, particularly, in men with evidently longer 2nd finger to reveal their attempts to compensate presumably lower prenatal androgenisation by increasing their physical strength.
IX PSYCHIATRY, PSYCHOTHERAPY, PSYCHOSOMATICS, NEUROLOGY

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EFFECTIVITY OF INTRAVENOUS THROMBOLYSIS AMONG
PATIENTS WITHOUT PROVED ARTERIAL OCCLUSION

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Keywords. Acute ischemic stroke. Thrombolytic therapy. Clinical outcome.

Introduction. Approximately 20–30% of acute ischemic stroke patients do not show an arterial occlusion on a cerebral angiography. There are few studies where efficacy of intravenous tissue type plasminogen activator (IV tPA) in stroke patients without arterial occlusion was evaluated.

Aim. The aim of this research was to evaluate whether IV tPA improves clinical outcome in ischemic stroke patients without visualized arterial occlusion and to assess safety and efficacy of IV tPA.

Materials and methods. This was a retrospective medical record-based study of acute ischemic stroke patients who were admitted to Pauls Stradiņš Clinical University Hospital, between January 1st, 2016 and December 31st, 2017. All patients (n = 174) were divided into 2 groups: IV tPA (IV tPA group) – patients who received tPA (n = 87) and control group – patients who did not receive tPA therapy (n = 87). National Institutes of Health Stroke Scale (NIHSS) score and modified Rankin Scale (mRS) were evaluated for all subjects. A marked and immediate clinical improvement was defined by a ≥ 4-point reduction in NIHSS score as well as clinical improvement by NIHSS score severity-no symptoms to minor stroke (NIHSS 0–4) and moderate to severe stroke (NIHSS ≥ 5). Based on mRS each patient was classified as either functionally independent (mRS score, ≤ 2) or dependent (mRS score, > 2). The safety outcome measure was symptomatic intracranial hemorrhage (sICH).

Results. NIHSS significant decrease on discharge were noted in both groups. Immediate clinical improvement was observed in 69.0% (N = 60) of patients in IVT group and in 26.4% (N = 23) of patients in control group. In group where NIHSS was 0–4, clinical improvement on discharge was higher in IV tPA group – 68.2%, comparing to control group – 51.2%. In group where NIHSS was ≥ 5, significant better outcome was in IV tPA group – 64.9%, but in control group it was poor, only 45.7%. On discharge from hospital, functionally independent patients in IV tPA group were 63.2% versus 59.7% in control group, besides dependent patients where noted 36.7% in IV tPA group versus 40.2% in control group. Clinical improvement was significantly higher in IVT group – 50.4%, but in control group it was poor, only 30.4%. Frequency sICH was equal in both groups – 2.3% (N = 2), respectively.

Conclusion. The results of this study show that IV tPA given 4.5 hours after the onset of stroke symptoms was associated with a significant improvement in the clinical outcome, without a higher rate of symptomatic intracerebral hemorrhage. Therefore, we can conclude that IV tPA is safe and effective treatment for acute ischemic stroke without documented arterial occlusion.
THE RESULTS OF USING IMPLANTABLE LOOP RECORDER DEVICES IN CRYPTOGENIC STROKE SURVIVORS FOR STROKE ETIOLOGY DETERMINATION IN PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL FROM 2014 TO 2017

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Keywords. Cryptogenic stroke, loop recorders, atrial fibrillation.

Introduction. Cryptogenic stroke is a cerebral infarction for which no probable cause is identified after an adequate diagnostic evaluation. Despite the advances in understanding of ischemic stroke pathophysiology, cryptogenic strokes remain a diagnostic and therapeutic challenge. Identifying atrial fibrillation (AF) is relevant as AF-related strokes are associated with an increased risk of disability and death, and they tend to recur when anticoagulation is not implemented. However, conventional HR monitoring methods (ECG, Holter) are sometimes insufficient to rule out possible AF. The self-terminating and often asymptomatic nature of paroxysmal AF may lead to its underdetection and thus no treatment. Therefore, implantable loop recorders (ILR) have taken an important role in revealing AF, as the next episode may occur after some time. Detection of AF usually prompts long-term anticoagulation instead of antiplatelet therapy because anticoagulation has been proven to reduce morbidity by reducing the probability of recurrent strokes. Since 2014, Pauls Stradiņš Clinical University Hospital has started to use ILR to specify stroke etiology among cryptogenic stroke survivors. This study collects the first results of ILR application in Latvia.

Aim. To evaluate the incidence of AF among cryptogenic stroke survivors using implantable loop recorders.

Materials and methods. Retrospective study included cryptogenic stroke survivors who had ILR implanted between the years 2014 and 2017. The data was collected from electronic database, medical histories, and via phone. The analysis of data was carried out using IBM SPSS 23.0.

Results. The study included 22 cryptogenic stroke survivors. The patients were aged from 42 to 74 (mean 55.18) years. There were 5 (23%) women and 17 (77%) men. In 7 (31.82%) patients atrial fibrillation was found, time ranges from 2 to 8 months (mean 4.8). Out of all revealed AF patients, 5 (71.4%) were under anticoagulant therapy. Out of all patients, 2 had a recurrent stroke and 1 was diagnosed with AF and did not use any anticoagulants, and the other one has never checked loop recorder data and was not under any anticoagulant therapy.

Conclusion. Among patients with cryptogenic stroke, AF was detected in 31.82% (n = 7). These results suggest that the implantable loop recorder is an effective way of finding subclinical AF. Loop recording monitoring is superior to conventional monitoring and may be considered after a cryptogenic stroke for patients who are good candidates for anticoagulation.
NEUROPROTECTIVE EFFECT OF R-PHENIBUT FOLLOWING TRAUMATIC BRAIN INJURY IN MICE

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Keywords. R-phenibut, traumatic brain injury, γ-aminobutyric acid, Nissl-stained dark neurons.

Introduction. Traumatic brain injury (TBI) is a leading cause of mortality and morbidity worldwide. TBI can result in temporal or long-term, even life-long, physical, cognitive and behavioral problems. Thus, there is increased need for effective pharmacological approaches for treating patients with TBI and its associated symptoms. Our previous results show that R-phenibut possesses neuroprotective activity in experimental models of stroke. These effects are thought to be related to the modulatory effects of the drug on the GABA-B receptor and α2-δ subunit of voltage-dependent calcium channel.

Aim. The aim of this study was to evaluate the effects of R-phenibut on neurobehavioral and histological outcomes following traumatic brain injury.

Materials and methods. Male SW mice were subjected to lateral fluid percussion (IFP) brain injury. Two hours after trauma, animal received intraperitoneal injection of R-phenibut at doses of 10 and 50 mg/kg and were then administered daily for an additional 7 days. The neurobehavioral status of SW mice was assessed on post-TBI days 1, 3 and 7 by the neurological severity score (NSS) testing. Nissl (cresyl violet) staining was used to assess neuronal injury. Nissl-stained dark neurons (N-DNs) were investigated in the cerebral neo-cortex at the level of the cortical impact at day 7 after the IFP brain injury.

Results. TBI induced significant functional deficits in mice compared with sham-operated mice. The average NSS in control group was 5.0 ± 0.6 on post-injury day 7. R-phenibut treatment at a dose of 50 mg/kg significantly ameliorated functional deficits after TBI on post-injury days 1, 3 and 7. The average NSS after treatment with R-phenibut at a dose of 50 mg/kg was 3.5 ± 0.3 on post-injury day 7. Histological analysis showed that R-phenibut treatment at a dose of 50 mg/kg significantly reduced the number of N-DNs in neo-cortex after TBI.

Conclusion. Our results provide evidence that R-phenibut reduces early neuronal injury, improves functional recovery and it might be used in clinical therapy in the acute phase after TBI.

Acknowledgements/Funding. This study was supported by the framework of EU-ERA-NET NEURON TRAINS and RSU/RTU-18 collaborative research project funding.
NEUROIMAGING OF POSTERIOR CIRCULATION CEREBRAL INFARCTION

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Keywords. MRI, posterior circulation infarction, PCI, neuroimaging.

Introduction. Due to the variability of clinical symptoms in cases of posterior circulation infarction, clinical determination of localization of ischemic lesion is often impaired. Therefore, it is very important to use sensitive diagnostic techniques to detect the localization and extent of lesion and decide on treatment choices.

Aim. To analyse CT, CTA, CTP and MRI findings of patients with posterior circulation infarction in one tertiary care centre.

Materials and methods. A retrospective study comprised 280 cases of posterior circulation cerebral infarction selected from “Stroke register” data from 2016 to 2017. Neuroimaging findings were collected from patients’ medical reports and AI_RIS database. Based on the localisation of the stroke, data were divided and analysed in 3 groups: I-posterior cerebral artery (PCA) territory, II-brainstem, III-cerebellum. Data were analysed with programs MS Excel, SPSS using descriptive statistical methods with confidence interval (CI) of 95%.

Results. 140 (50%) of patients were male, other 140 – female. The mean age was 68.04 ± 1.6 years, median – 69.5. The most common ischemic stroke subtypes were Large-artery atherosclerosis in 36.4% CI ± 7.5 and cardioembolism in 35.4% CI ± 8.5 of cases.

Localization of lesion was found in 233 cases (93.2% CI ± 13). In 118 cases (50.5% CI ± 2.8) lesion was localised in PCA territory. 37.3% CI ± 2.8 and 33% CI ± 8.6 of lesions were located in brainstem and cerebellum. Both CT and MRI were done in 101 (36%) cases. MRI was more sensitive for detecting lesions in brainstem, with CT-MRI+ findings in 94.7% ± 1.6 of cases, where in group I – 58.3% ± 4.8 and group III – 79.2% ± 2.9 of cases.

CT and CTA both were done in 202 (72.1%) cases. In native CT hyperacute changes were seen only in 27.3% CI ± 3.3 of cases where in CTA pathological changes were found in 58.4% CI ± 2.3 of cases. Hyperdesce a. basilaris and a. vertebralis in 9 (26.5% n = 30) and 4 (11.8% n = 34) cases were visible in CT scans alone. Both CT and CTP were done in 94(33.6%) cases. In 47 (50%) cases lesion was not found. CTP was useful for detecting lesions in PCA territory and cerebellum- CTP+ lesions were detected in 82.7% ± 4.6 and 75% ± 11.2 of cases correspondingly. Acute changes on the 1st CT scan were seen only in 27.3% CI ± 3.3 (n = 75): 61.3% of cases in PCA territory and 34.7% of cases in cerebellum. In repeated CT, new acute or subacute lesions were found in 45.5% CI ± 4.3 of cases.

Conclusion. Posterior circulation cerebral infarction most often affects PCA territory. A native head CT is not very sensitive to detect early signs of stroke, but it is a “golden standard” for exclusion of intracerebral haemorrhage. In case of brainstem stroke, MRI is the most sensitive method, where CTP has limited sensitivity. Otherwise, CTA and CTP give additive information about site of vascular occlusion, infarct core, salvageable brain tissue and degree of collateral circulation.
LATVIAN POPULATION AWARENESS OF RISK FACTORS, SIGNS AND ACTIONS IN CASE OF INFARCTION AND STROKE

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Keywords. Infarction, stroke, awareness, risk factors.

Introduction. Cerebrovascular and cardiovascular diseases are the most widespread diseases among European populations. Due to what it is highly necessary to understand whether Latvian population is aware of these diseases and to evaluate the level of knowledge in different age groups about these diseases.

Aim. To investigate Latvian population awareness of risk factors, signs and actions in case of stroke and infarction, to understand if population is needed to be more educated.

Materials and methods. To evaluate the level of awareness questionnaire among different age groups was used. Data processing: Microsoft Excel, SPSS Statistics.

Results. In this research 389 respondents, aged 18–90 participated. Average age 53.5, 73 % females and 27 % males. 65.0 % of respondents claimed they were concerned about their heart health. 74.3 % of them were in group 51–70 and 96.3 % > 70. 84.8 % claimed they know what stroke is, however, 26.2 % of those thought that stroke is severe headache. 84.9 %, answered that they know what is miocardial infarction (MI), whereas, 32.5 % of those who did not knew right answer, thought MI is heart malfunction and 26.1 % answered high blood pressure. Only 31.9 % would recognize stroke signs in themselves or other people. 22.9 % would not recognize and 45.2 % would recognize only in severe case.

The results have shown that only 76.36 % of respondents consider acute vision deterioration as a sign of stroke. 27.5 % of respondents said that they could recognize signs of infarction in themselves or other 18.13 % answered that they would evaluate their blood pressure in order to understand whether they have a stroke. 4.37 % answered that they would go to the hospital by themselves rather than calling the ambulance. 66.84 % of respondents considered that fear of death might be a sign of infarction. 90.49 % believed that high blood pressure is a risk factor for stroke and infarction.

Other risk factors listed in the questionnaire got vastly lower percentage of positive answers. Respondents < 30, comparing to other groups did not consider smoking as a risk factor. Respondents older that 71 are the most informed about high cholesterol level is a risk factor, however, 71.8 % of< 30 group thought the same way. Diabetes as risk factor was mentioned only by 76.3 % among all age groups. Respondents aged > 71 (92.6 %) are the most informed about obesity being a risk factor as well. Only 72.9 % of respondents aged < 30 considered it to be a risk factor as well.

Conclusion. The research have shown that Latvian population has to be educated more about prevention of cardiovascular and cerebrovascular diseases.
INCREASED GENE EXPRESSION OF TISSUE INHIBITOR OF METALLOPROTEINASES TIMP-1 IS ASSOCIATED WITH THE SEVERITY OF TRAUMATIC BRAIN INJURY

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Keywords. Traumatic brain injury, hippocampus, cortex, TIMP-1.

Introduction. Traumatic brain injury (TBI), defined as an alteration in brain functions caused by an external force, is responsible for high morbidity and mortality around the world. It is important to identify and treat TBI as early as possible. New prognostic biomarkers after acute TBI are needed to evaluate the severity of head trauma and choose appropriate treatment. Inflammation is a rapid tissue response after trauma and determines a progress of injury.

Aim. The aim of the study was to detect and compare the inflammation process-related gene expression in mice brain tissues after different severities of TBI.

Materials and methods. Weight-drop TBI model was used to induce head injury in male SW mice. The severity of trauma was scored using scale: no trauma (sham-operated) – 0; mild injury (trauma without skull fracture) – 1; mild skull fracture – 2; moderate skull fracture – 3; severe skull fracture – 4. The neurobehavioral status of SW mice was assessed 24 h after TBI by the neurological severity score (NSS). IL-6, IL-1β, IL-10, tumour necrosis factor (TNF) -α, matrix metalloproteinase (MMP) -9 and tissue inhibitor of metalloproteinases (TIMP) -1 gene expressions were measured by quantitative real time-PCR analysis in ipsilateral and contralateral hippocampus and cortex 1 and 3 days after TBI. The statistical calculations were performed using GraphPad Prism 7.0.

Results. TBI induced significant functional deficits in mice compared with sham-operated mice and NSS correlated with the severity of trauma. The most pronounced effect was a 112 fold increase of TIMP-1 gene expression in ipsilateral hippocampus 1 day after trauma with skull fracture. TBI induced 28 fold increase of TIMP-1 gene expression in ipsilateral cortex. Significant correlation between the level of TIMP-1 gene expression in ipsilateral hippocampus and severity of TBI was found. TBI induced also more than 2 fold increase of IL-6, IL-1β and more than 3 fold increase of TNF-α gene expression in ipsilateral hippocampus and cortex after skull fracture. TBI induced more than 2 fold IL-6, TNF-α gene expression also in contralateral hippocampus and cortex after skull fracture. Significant increase of IL-1β gene expression was found in ipsilateral cortex 1 day after TBI. There were no significant changes in MMP-9 gene expression in hippocampus and cortex.

Conclusion. Our results show that TIMP-1 could be used as an early tissue marker for differentiation of severity of experimental head injury during the first days after trauma.

Acknowledgement. This study was supported by the framework of the EU ERA-NET NEURON CnsAFlame project funding.
EXAMINATION OF PATIENTS WITH INTRACEREBRAL HEMATOMA BEFORE TREATMENT

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Keywords. Intracerebral hematoma, blood pressure, Glasgow coma scale.

Introduction. Intracerebral hematoma is the most common manifestation of chronic, progressive cerebrovascular disease. With a predictable incidence, 35 to 45 patients per 100,000 of Europe's and North America's population, accounting for about 10% of hemorrhagic strokes.

Aim. To show the difference in vital signs between alive and dead patients before treatment.

Materials and methods. Data were collected from the two largest hospitals' archives in Latvia - the Pauls Stradiņš Clinical University Hospital and RAKUS Gailezers. The study was conducted retrospectively for the history of patients. Data were processed using SPSS IBM v. 20 and a P-value of 0.05 was considered to be statistically significant. Continuous variables were examined using independent t-test and chi-square test for categorical variables.

Results. A total of 153 patient histories were selected. We found that there is no statistically significant difference (p = 0.086) of systolic blood pressure for the patients who were discharged from hospital alive (M = 188.23 mmHg; SD = 34.93 mmHg) and dead ones (M = 175.28 mmHg; SD = 43.78 mmHg) but there is statistically significant difference (p = 0.009) of diastolic blood pressure for the patients who were discharged from hospital alive (M = 101.68 mmHg; SD = 17.9 mmHg) and dead ones (M = 97.45 mmHg; SD = 25.314 mmHg). There are statistically significant difference (p < 0.000) of Glasgow coma scale for the patients who were discharged from hospital alive (M = 13.48; SD = 2.6) and dead ones (M = 7.7; SD = 4); hematoma volume (p < 0.000) between patients who were discharged from hospital alive (M = 14.78 ml; SD = 24.77 ml) and dead ones (M = 76.39 ml; SD = 77.68 ml). Brain dislocation (p < 0.000) was more common in patients which were discharged dead. The same for patients with brain swelling (p = 0.001).

Conclusion. Patients who are discharged as dead have worse onset than patients who are alive, excepting systolic pressure.
STROKE RISK COMPARISON BETWEEN PATIENTS WITH DIFFERENT ACTIVITY LEVELS

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Keywords. Ischemic stroke risk, glucose, cholesterol, blood pressure.

Introduction. The ischemic stroke is an acute circulatory disorder in the brain. Stroke most often develops due to various risk factors. The risk of stroke is assessed by the level of human activity, arterial blood pressure, heart rhythm disorders, smoking, cholesterol, glucose, body weight index, and inheritance.

Aim. Prove that a city with more activity opportunities will have a lower risk for stroke and its rates.

Materials and methods. Blood pressure, glucose, cholesterol measurements (on an empty stomach), determination of BMI, as well as a survey, were performed in three different cities of Latvia with a high, medium and low physical activity range. All analyses were performed using SPSS IBM v. 20 and a P-value of 0.05 was considered to be statistically significant. Continuous variables were examined using analyses of variance and chi-square test for categorical variables.

Results. A total of 486 individuals have been viewed. Of these, 150 live in a city with a large selection of activities, 180 with medium-level activities and 156 with low-activity choices for older people. We concluded that systolic pressure was not statistically significantly different among different cities (p = 0.29) but diastolic pressure (p < 0.000), atrial fibrillation (p < 0.000), smoking (p = 0.003), cholesterol (p = 0.025), glucose (0.029), physical activity (p < 0.000), BMI (p < 0.000) is statistically significantly different between different cities. The risk among the groups (p = 0.005), the highest risk is in the group with low activity in the city 52% (n = 78) and the lowest risk is in the city with a high activity range 38% (n = 69) and the average range of activities is 45% (n = 72).

Conclusion. The highest risk of stroke is in a group with a low activity level, but the lowest with a high level of activity. Risk factors and stroke development go hand in hand with the level of activity, so cities that care about the well-being of their people are more vulnerable to stroke.
IS INTRAVENOUS THROMBOLYSIS NECESSARY IN LARGE VESSEL STROKE?

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Keywords. Bridging therapy, mechanical thrombectomy, stroke.

Introduction. Intravenous thrombolysis (IVT) is the first line treatment for acute stroke patients. Recent guidelines note that mechanical thrombectomy (MT) is strongly recommended for large artery occlusion in acute stroke patients. There are controversial data about efficacy and safety of combined IVT and MT therapy (bridging therapy, BT) comparing with MT alone.

Aim. To compare efficacy and safety of BT to that of MT in patients with large vessel acute ischaemic stroke.

Materials and methods. Acute stroke patients, treated in Vilnius University Hospital Santaros Clinics and Republican Vilnius University Hospital between January 2016 – January 2017, which underwent MT were included in the study. Patients were divided in two groups: BT (receive IVT prior MT) and MT (receive MT alone). Demographic, clinical and logistic features were evaluated. The primary outcome was National Institute of Health Stroke Scale (NIHSS) score change over the first 24 h and favourable outcome (defined as NIHSS score of 0–1 or score decline by 4 or more points within 24 h after treatment). Secondary outcomes were onset-to-recanalization and needle-to-recanalization time. 7 days mortality and rate of symptomatic intracerebral haemorrhage (SICH) were chosen for safety analysis.

Results. 49 and 30 patients were treated with BT and MT respectively. There were no significant differences in demographic, clinical features and risk factors between two groups. Mean NIHSS score change over 24 h (4.2 in BT and 5.8 in MT, p > 0.05) and favourable outcome (59.1 % and 60 % respectively, p > 0.05), as well as mean onset-to-recanalization (273 and 269 min, p > 0.05) and needle-to-recanalization (56 and 54 min, p > 0.05) did not differ significantly. Although SICH rates were similar (p > 0.05), 7 days mortality was lower in MT group (accordingly 13.0 % and 0 %, p < 0.05).

Conclusion. In comparison with BT, MT alone is an effective and, possibly, safer treatment method. As results indicate potential economic and clinical benefits of isolated MT, larger randomized multicentre study is required to support these findings.
MYASTHENIA GRAVIS – PATIENT OF RIGA EAST CLINICAL UNIVERSITY HOSPITAL EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS IN YEARS 2013–2017

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Keywords. Myasthenia gravis, MGFA classification, epidemiology, treatment.

Introduction. Myasthenia gravis is the most common chronic autoimmune neuromuscular disease. There are about 250 patients with this disease in Latvia. The disease is predominantly progressive and the treatment does not provide a complete recovery. However, in many patients, it reduces symptoms, improves quality of life, thus conquering disabilities. In 70% of cases, a good or a very good result can be achieved.

Aim. To evaluate the epidemiological and clinical characteristics of patients with Myasthenia gravis in Latvia from the Riga East Clinical University Hospital from the Clinical Center “Gaiļezers”.

Materials and methods. The epidemiological and clinical situation was assessed by a retrospective cross sectional study at the stationary “Gaiļezers”. The retrospective research evaluated 74 recorded cases of myastenia gravis in years 2013–2017. All statistical data has been processed in the program “SPSS”.

Results. The study included 74 myasthenia gravis cases, among them 50 (67.6%) were female and 24 (32.4%) were male. Mean age was 55.84 ± 15.6 years. Pearson Chi-Square test: male and female occur myasthenia gravis with equal probabilities. The significance level is 0.701. Myasthenia Gravis Foundation of America clinical classification: class 1: 11 (14.9%) patients; class 2a: 12 (16.2%) patients; class 2b: 14 (18.9%) patients; class 3a: 11 (14.9%) patients; class 3b: 8 (10.8%) patients; class 4a: 6 (8.1%) patients; class 4b: 12 (16.2%). One-Sample Chi-Square test: the categories of MGFA classification occur with equal probabilities. The significance level is 0.658. 3 (4%) patients had autoimmune thyroiditis; 31 (41.9%) had arterial hypertension; 1 (1.35%) patient had chronic obstructive pulmonary disease; 4 (5.4%) patients had diabetes and 57 (77%) patients had other diseases. Medication used: cholinesterase inhibitor in 67 (90%) cases; prednisolone in 47 (63.5%) cases; azathioprine in 9 (12%) cases; immunoglobulin therapy used in 7 (9.45%) cases; plasmapheresis used in 14 (18.9%) cases.

Conclusion. According to received and analysed information there is no significant difference between patients gender and myasthenia frequency and MGFA clinical classes 1–4b appear equally often. Concomitant diseases appeared in 77% cases, arterial hypertension was the most common concomitant disease. Cholinesterase inhibitors was the most common medication used.
MOLECULAR DIAGNOSTICS OF KENNEDY DISEASE IN LATVIA: FIRST YEAR EXPERIENCE

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Keywords. Kennedy disease, AR, SBMA, spinal and bulbar muscular atrophy.

Introduction. Kennedy disease, also known as spinal and bulbar muscular atrophy (SBMA), is a rare X-linked motor neuron disease with the prevalence 1:30,000–300,000 and incidence 1:400,000–500,000 males per year. Kennedy disease is caused by the expansion of CAG triplets (> 35 CAG) in the first exon of the androgen receptor coding gene (AR), causing accumulation of the receptor in nuclei and subsequent motor neuron damage. It may be hard to differentiate Kennedy disease from other neuromuscular disorders because of its clinical heterogeneity and pleiotropy. Genetic analysis of CAG repeat in AR gene is the only confirmative diagnostic test.

Aim. To analyze the AR gene CAG repeat polymorphism in patients with suspicion of Kennedy disease and in healthy population of Latvia.

Materials and methods. Seven patients with suspicion for Kennedy disease were referred for molecular analysis of AR gene for CAG repeat expansion since March 2017. Patients were referred from clinical geneticists and/or neurologists.

To assess the range of CAG repeats in healthy Latvian population we genotyped 100 X chromosomes of healthy female subjects from database of RSU Scientific laboratory of molecular genetics. Fluorescent PCR with capillary electrophoresis was used to analyze the number of CAG repeats in AR gene. The results and specificity of the assay were confirmed using automated Sanger sequencing.

Results. The diagnosis of Kennedy disease was confirmed molecularly in four out of seven patients (57 %). The range of CAG repeats among confirmed patients is from 45 up to 54 CAG repeats. The number of CAG repeats varied in healthy subjects from 15 up to 30 CAG with median 22 CAG repeats and mean 23 ± 3 CAG repeats.

Conclusion. The diagnosis of Kennedy disease was confirmed molecularly in four patients in the first year since the analysis was started in Latvia. The number of CAG repeats varies from 15 up to 30 in the healthy Latvian population.
OLFACTORY FUNCTION DECREASE IN PATIENTS WITH LOW MONTREAL COGNITIVE ASSESSMENT SCORE

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Keywords. Mild cognitive impairment, dementia, neurodegenerative diseases, olfactory dysfunction, olfactory Screening 12 Test, Montreal Cognitive Assessment.

Introduction. As the population ages, incidence of neurodegenerative diseases is increasing. Lack of validated biomarkers for neurodegeneration creates a challenge for early diagnosis and treatment options. Early diagnosis is at the utmost importance as the therapy options are most effective in the initial stages of disease. Loss or decrease of olfactory function is part of physiological aging process, but might be a sign of early neurodegenerative diseases that result in dementia.

Aim. Study aims to prove correlation between complete or partial loss of olfactory function and decrease in cognitive function, which can be used as an early predictor of neurodegenerative diseases of the central nervous system.

Materials and methods. Cross-sectional study was performed by interviewing selected patients from Neurological clinic and random patients from Cardiology clinic. Inclusion criteria were patients above age of 60 with no history of strokes. Patients were questioned on the subject of smoking, time of previous meal, occupational factors, respiratory diseases, other comorbidities, self-observed taste and smell changes. After the interview patients were assessed using The Montreal Cognitive Assessment (MoCA) and with validated olfactory Screening 12 test. Data was analysed using Microsoft Excel and SPSS programs.

Results. Interview was conducted with 28 patients with average age of 73 years. Patients were divided in 3 groups based on MoCA score: normal cognitive function (≥ 26 points, 8 patients), mild cognitive impairment (17–25 points, 11 patients) and dementia (≤ 16 points, 9 patients). Normal cognitive function group recognized 9 out of 12 possible scents on average, mild cognitive impairment group recognized 7 scents, while dementia group recognized 6 scents correctly. When asked about smell and taste self evaluation, changes were noted mostly by mild cognitive impairment group (6 out of 11 patients), while in dementia group only 3 out of 9 mentioned some changes.

Conclusion. Low MoCA scores have direct correlation with decreased sense of smell, based on the Screening 12 test. Normal cognitive function group had the best scores in smell test, while dementia group scored the lowest. Considering the decrease in olfactory function, in both dementia and mild cognitive impairment groups, Screening 12 test can be used as an additional examination tool for possible evaluation of neurodegeneration.
EQUIVALENCE BETWEEN ELECTRONEUROMYOGRAPHICAL AND CLINICAL EXAMINATION WHILE DIAGNOSING PERIPHERAL NEUROPATHIES

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Keywords. Carpal tunnel syndrome, electroneuromyography, clinical symptoms.

Introduction. Carpal tunnel syndrome (CTS) is a common peripheral neuropathy. Electroneuromyography (ENMG) is a golden standard to diagnose it. However, it has some limitations. Thus, clinical evaluation should gain a significant value.

Aim. To evaluate the correlation between ENMG data and clinical tests while diagnosing CTS.

Materials and methods. During 2015–2017 a prospective study was performed in Vilnius University Hospital Santaros Clinics. Selection criteria were: hand numbness and typical changes for CTS found by ENMG. 60 patients were included. A sample had 93 hands. The patients fulfilled a questionnaire, specified demographical data and symptoms they felt. Then they draw on a hand diagram in which areas they felt their symptoms. Clinical examination included these symptoms: Tinnel’s, Phalen’s, fist, monofilament, shake, vibration sense and carpal compression tests, thumb abduction, index hypalgesia, thenar atrophy, impaired two-point discrimination. Analysis was made with Microsoft Excel 2013 and SPSS v.20. Pearson's and \( x^2 \) tests were used, difference was significant when \( p < 0.05 \).

Results. There were 50 (83 %) females and 10 (17 %) males. The mean of age was 57.8 ± 11.4 years. 58 (97 %) patients were right handed, 2 (3 %) – left handed. 53 (57 %) right hands and 40 (43 %) left hand were evaluated. 34 (56.7 %) patients had physical jobs, 21 (35 %) – intellectual and 5 (8.3 %) patients did not describe their works. ENMG showed 35 % of cases had mild 37.5 % – medium and 27.5 % – severe CTS. Typical for CTS hand diagram determined in 85 (91.4 %) patients, both Tinnel’s and shake tests were positive in 66 patients (71 %), index hypalgesia – in 54 (58.1 %) patients. Clinical sensitivity of these tests is 0.95. Less than half of patients had positive other symptoms. Clinical symptoms, motor impulse conduction amplitude (mV) and distal motor latency duration had medium strength correlation (\( p = 0.01 \)). Age significantly influence the manifestation clinical symptoms (\( p = 0.02 \)).

Conclusion. Typical hand diagram, shake and Tinnel’s tests together with index hypalgesia are sensitive enough to diagnose CTS. Their results correlate with ENMG conclusion. Age, gender and type of work influence the development of CTS.
PSYCHE AND THE SKIN: 
A MULTIDISCIPLINARY APPROACH

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Keywords. Psychodermatology, anxiety, depression, DLQI.

Introduction. Psychodermatology, a remarkable dermatology subspecialty, deals with the synergy between the skin and CNS. Psychocutaneous diseases are classified as: psychophysiological (psychosomatic) disorders, primary psychiatric disorders with dermatological symptoms, dermatological disorders with secondary psychiatric symptoms and miscellaneous.

Aim. The aim of this study was to detect the prevalence and level of anxiety and depression in dermatology patients; to measure the impact of the skin well-being in participants QoL; and to analyze literature that links psychological disorders and skin diseases.

Materials and methods. This case-control study was performed in Latvia, from September to November 2017, with the collaboration of 62 volunteers including: dermatology patients and a control group participants. The participants in patient group included the following skin conditions: Psoriasis, Rosacea, Acne, Vitiligo and Atopic Dermatitis. Two questionnaires were used: HADS and DLQI. Statistical analysis involved the following methods/tests: descriptive statistics methods, Shapiro-Wilk test, Median test, Mann-Whitney U test, Kruskal-Wallis test, independent samples t-test, Chi-square test and Fisher’s exact test.

Results. The sample included 32 participants in patients group (20 females, 12 males), and 30 participants in control group (15 females, 15 males). The total sample participants’ mean age was 37. Females are significantly more anxious (p < 0.001), score higher depression (p = 0.037), and higher DLQI (p = 0.034) than males. Age has no impact on anxiety and DLQI; depression is seen more often in older participants (p = 0.021). Anxiety prevalence is close to significant (p = 0.054) in patients group when compared with control; patients group are significantly more depressed than control (p = 0.002); DLQI is significantly higher in patients group (p < 0.001) than in control group. Anxiety is significantly higher in psoriasis, acne and vitiligo patients than in control group (p < 0.05). Depression is significantly higher in vitiligo patients than in acne, rosacea and control group (< 0.05).

Conclusion. Females are more anxious, have higher depression distribution and higher impact of skin on QoL. Age has no influence on anxiety prevalence and skin impact on QoL, but depression scores are higher in older age participants. Anxiety scores are higher (close to significant) in patients group than in control group, however, depression and skin impact on QoL are significantly higher in patients group. Anxiety is significantly higher in psoriasis, acne and vitiligo patients than in control group. Vitiligo patients are significantly more depressed than acne, rosacea and control group participants. Despite of no skin disease, skin still has some impact on control group QoL, reinforcing the crucial role of the skin in daily interactions and socialization, and can reach extremely large impact in psoriasis and atopic dermatitis patients.
PHANTOM PAIN INCIDENCE AND RISK FACTORS IN PATIENTS WITH NON-TRAUMATIC AMPUTATIONS

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Keywords. Phantom pain, phantom sensation, non-traumatic amputations.

Introduction. Phantom pain is complex pathology that is responsible for dramatic decrease in patients quality of life. Mechanisms of this neuropathic pain is not yet fully understood, therefore pain management in this case is complicated, as it requires an individualistic approach and patients cooperation. Increase in cardiovascular and metabolic disease incidence results in rise in requirement for amputations.

Aim. Study aims to evaluate phantom pain incidence and risk factors in correlation to phantom pain development.

Materials and methods. Retrospective study was concluded using data from patients medical histories. Inclusion criteria was patient undergoing non-traumatic amputation in the last 18 months. Data on 102 patients was gathered. Information on patients age, sex, hospital stay, primary diagnosis, comorbidities, complications, received medication, length of preoperative pain, type of anesthesia during surgery and whether phantom pain was experienced during hospitalization was assessed. Further these patients were interviewed by phone on subject of phantom pain and phantom sensation following surgery. Patients were asked to describe and evaluate their pain using PainDetect scale and McGill Pain Questionnaire. Data was analyzed using Microsoft Excel and SPSS programs.

Results. Study concluded that average hospital stay for patients after amputation is 17.5 days and longer stay is connected to increased risk of phantom pain manifestation (18.3 days) and increased mortality, as average hospital stay of patients that died in hospital was 22.4 days. In total 26 patients (25.5%) out of 102 developed phantom pain. Twenty-two patients (84.6%) with phantom pain received spinal anesthesia during surgery. Atherosclerosis, with 73.1% (n = 19), was most frequent primary diagnosis in patients with phantom pain and gangrene was most frequent complication, with 73.1% (n = 19). Preoperative sense of pain showed that 57.7% (n = 15) of phantom pain patients were experiencing preoperative pain for 1–7 days.

Conclusion. Total incidence of phantom pain in patients undergoing amputation in the last 18 months was 25.5%. Patients with acute amputations due to preoperative pain (1–7 days) are in higher risk group for developing phantom pain. Spinal anesthesia is the most common used type of anesthesia during amputations, therefore majority of the phantom pain patients (84.6%) received this anesthesia method. Overall increase in cardiovascular disease incidence in population is a major risk factor for phantom pain manifestation in amputees.
BACK PAIN AMONG MEDICINE STUDENTS

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Keywords. Back pain, exercise, medical students.

Introduction. Back pain is a common problem among older and younger adults. However, students of medicine spend more hours of sitting and studying than others. One of the research questions was: “How does it affect students back health and does doing exercises prevent from back pain?”

Aim. To investigate how commonly students have back pain by proving that doing exercises help to prevent back pain.

Materials and methods. A questionnaire was carried out from the first to the sixth course and based on the received answers the results were designed. One of the questions in the questionnaire was “Do you exercise? Did you have back pain before studying in medical school? Did back pain start during the studies of medicine? What kind of pain do you have? How long can you sit in lectures? All analyses were performed using SPSS IBM v. 20 and a P-value of 0.05 was considered to be statistically significant. Continuous variables were examined using independent t-test.

Results. 363 students filled in the questionnaire. In the 1st course – 85 students, 2nd – 71, 3rd – 67, 4th – 48, 5th – 44 and 6th 48. Before medical school back pain for the first course was 41.8% (n = 35), second 38% (n = 27), third 28.4% (n = 19), fourth 16.7% (n = 8), fifth 15.9% (n = 7), sixth 14.6% (n = 7). Back pain that started during medical school first course answers were 50.59% (n = 43), second 57.8% (n = 41), third 70.2% (n = 47), fourth 75% (n = 36), fifth 61.4% (n = 27), sixth 56.3% (n = 27). Independent – Samples T test found that student that didn’t exercise (M = 68.60 min; SD = 63.70 min) and which did exercise (M = 48.34 min; SD = 45.47 min) there is statistically significant difference (p = 0.001).

Conclusion. If students exercise, it is less possible to have back pain. There is a significant amount of students in the first course who had back pains before the studies of medical school. There is a majority of students who have back pains that started during studies in medical school.
STIGMA TOWARDS DEPRESSION IN PRIMARY CARE

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Keywords. Depression, stigma, general practitioners, primary care.

Introduction. Depression is a common mental disorder, more than 300,000,000 people affected by this disease, which is either the leading cause of disability worldwide. Depression can be treated effectively, however, there are a lot of obstacles that can interfere with it. Stigma towards depression is one of causes leading to under-diagnosis and under-treatment.

Aim. This study aims to describe the attitudes of general practitioners towards misleading statements about depression in Lithuania.

Materials and methods. 113 general practitioners from Lithuania completed self-report questionnaire: a Likert type scale included 8 misleading statements about depression. Correct answers “strongly disagree” and “disagree” were summed up together and described as percentage frequencies. It is shown in results how many general practitioners disagree with these misleading statements.

Results. “One of the main causes of depression is a lack of self-discipline and will-power” 50.4%; “Becoming depressed is a way that people with poor stamina deal with life difficulties” 53.1%; “Becoming depressed is a natural part of being old” 57.5%; “Once a person has made up their mind about taking their own life no one can stop them” 59.3%; “Depression treatments medicalise unhappiness” 37.2%, “Becoming depressed is a natural part of adolescence” 54.0%, “Psychological therapy tends to be unsuccessful with people who are depressed” 54.0%; “Antidepressant therapy tends to be unsuccessful with people who are depressed” 63.7%.

Conclusion. As results shown – stigma towards depression in primary care physicians is common problem. To reach better results in depression diagnosis and treatment we need to change the attitude of general practitioners towards depression. Most of publications announce that continual medical education has statistically significant influence for building more appropriate attitude.
THE FREQUENCY OF DEPRESSION AND ANXIETY IN WOMEN OF REPRODUCTIVE AGE WITH PSYCHIATRIC DISORDERS IN RIGA MATERNITY HOSPITAL

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Keywords. Psychiatric diseases, pregnancy, perinatal psychiatric disorders, postpartum depression.

Introduction. Disturbances in mental health in the perinatal period can cause negative personal and child developmental outcomes. There are several risk factors to take into consideration and one of the major ones is previous psychiatric disorders. Depression during the postnatal period especially can cause a negative effect on the child as well as the mother and intervene with the mothers’ ability to connect with the child and take care of it in the best way she could.

Aim. To find out the frequency of patients with different psychiatric disorders in the past or at the moment of the interview that present at the Riga Maternity Hospital.

Materials and methods. The study was performed during the period from 01.02.2017 till 31.12.2017 in Riga Maternity hospital including 235 women in the reproductive age range who presented in a post-delivery ward. Data collection was based on questionnaire form including basic patient information, the M.I.N.I (mini-international neuropsychiatric review) as well as questionnaires to assess depression and anxiety symptoms – the Edinburgh Postnatal Depression Scale (EPDS), Patient Health Questionnaire (PHQ-9) and General Anxiety Disorder (GAD-7). Data was processed in Microsoft Excel.

Results. Altogether 75 (31.9%) of the women presented with some kind of psychiatric disorder according to M.I.N.I in the past or at the moment of the interview. 43 (18.3%) of the women presented with depression at the moment of the interview according to EPDS, 23 (53.5%) of those women also had a psychiatric disorder according to M.I.N.I (with 17 (39.5%) of those corresponding to the depression diagnosis). 21 (8.9%) of the women presented with depression at the moment of the interview according to PHQ-9, 14 (66.6%) of those women also had a psychiatric disorder according to M.I.N.I (with 13 (92.9%) of those corresponding to the depression diagnosis). 22 (8.9%) of the women presented with anxiety at the moment of the interview according to GAD-7, 12 (54.5%) of those women also had a psychiatric disorder according to M.I.N.I (with 2 (0.9%) of those corresponding to the general anxiety disorder diagnosis).

Conclusion. This study shows that over 30% of the women who presented at the Riga Maternity hospital have had psychiatric disorders. Analyzing the depression and anxiety scales in the moment of the interview we can conclude that patients with previous psychiatric illnesses have only slightly higher depression symptoms that the ones that have no psychiatric illnesses in the past.
DEPRESSION, ANXIETY AND QUALITY OF LIFE AMONG LATVIAN DIABETIC PATIENTS AT RIGA EAST UNIVERSITY HOSPITAL OUT-PATIENT DEPARTMENT

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Keywords. Depression, anxiety, quality of life, diabetes mellitus.

Introduction. Depression and anxiety symptoms are highly prevalent in people with diabetes and are associated with poorer quality of life.

Aims, materials and methods. The aim of this cross-sectional study was to define prevalence of depression and anxiety symptoms and severity among diabetic outpatients, evaluate quality of life for diabetic outpatients. Sociodemographic questionnaire, PHQ-9, GAD-7, SF-36 assessment tools were used. The study took place at Riga East University Hospital Out-patient department. In total 101 diabetic outpatients were interviewed. IBM SPSS was performed for data analysis.

Results. In total depression symptoms had 33 (32.7%) outpatients: 21 (20.8%) – mild depression symptoms, 7 (6.9%) – moderate depression symptoms, 3 (3%) – moderately severe depression symptoms, 2 (2%) – severe depression symptoms. Anxiety symptoms had 20 (19.8%) outpatients: 12 (11.9%) – mild anxiety symptoms, 7 (6.9%) – moderate symptoms, 1 (1%) – severe anxiety symptoms. Both depression and anxiety symptoms had 15 (14.85%) outpatients. Diabetic outpatients with depression symptoms had poorer quality of life indices than diabetic outpatients without depression symptoms: physical functioning (PF) 67.12 vs. 82.57; role functioning/physical (RP) 40.15 vs. 82.72; role functioning/emotional (RE) 59.59 vs. 93.14; energy/fatigue (VT) 45.61 vs. 70.88; emotional well-being (EWB) 61.09 vs. 84.65; social functioning (SF) 70.08 vs. 95.59; pain (BP) 57.27 vs. 82.65; general health (GH) 30.00 vs. 46.79. Diabetic outpatients with anxiety symptoms had poorer quality of life indices than diabetic outpatients without anxiety symptoms: PF 70.25 vs. 79.32; RP 46.25 vs. 74.38; RE 59.00 vs. 88.89; VT 46.25 vs. 66.67; EWB 55.60 vs. 82.22; SF 69.38 vs. 91.67; BP 57.25 vs. 78.58; GH 34.60 vs. 42.96. There is a strong correlation between depression and anxiety (Spearman’s rho = 0.579; p = 0.000), depression and RP (Spearman’s rho = 0.515; p = 0.000), depression and VT (Spearman’s rho = 0.680; p = 0.000), depression and EWB (Spearman’s rho = 0.636; p = 0.000), depression and SF (Spearman’s rho = 0.636; p = 0.000). There is a strong correlation between anxiety and VT (Spearman’s rho = 0.535; p = 0.000), anxiety and EWB (Spearman’s rho = 0.643; p = 0.000).

Conclusion.
1. Depression and anxiety are highly prevalent among diabetic outpatients and both disorder screenings should be performed.
2. Depression and anxiety have negative impact on a quality of life for diabetic outpatients.
3. Among diabetic outpatients depression has strong correlation with anxiety, role functioning/physical, energy/fatigue, emotional well-being and social functioning.
4. Among diabetic outpatients anxiety has strong correlation with energy/fatigue and emotional well-being.
RELATIONSHIP BETWEEN DEPRESSION SYMPTOMS AND INVOLVEMENT IN REGULAR PHYSICAL ACTIVITIES IN SENIORS WITHOUT MENTAL OR BEHAVIOURAL DISORDERS

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Keywords. Depression, physical activity, seniors, healthy ageing.

Introduction. World Health Organization prognoses is that by the year 2050 the amount of people aged over 60 will nearly double from 11 to 22% % bringing significant health challenges. The most common psychological and neurological disorders for seniors at age 60 and over is depression which affects from 5 to 7% from the population. Nevertheless, individual’s physical activities, particularly in this age group is being considered as one of the crucial and predictive factors which can improve the physical and psychic health and depression as well. Research indicates a relationship between FA and indicators of depression in different context, but the results are still controversial.

Aim. The aim of this research was to examine relationship between engagement in regular physical activity and depression in seniors without diagnosis of mental and behavioural disorders.

Materials and methods. 47 Latvian-speaking participants aged 65–85 were included in the data analysis (M = 72.34; SD = 5.23). To assess depression symptoms Geriatric Depression Scale15 (GDS – 15) and Depression Scale from Latvian Clinical Personality Inventory (LCPI DS; Perejpolkina, Kolesnikova, Mārtinsone & Stepens, 2016) was used. To determine the physical activity of each participant a modified version of Social Determinants of Health Behaviours was used.

Results. Participants were divided into three groups based on their physical activity experience. The data were analysed with Kruskal-Wallis H test. There were no significant differences in physical activity and depression rates in seniors without diagnosis of mental and behavioural disorders (LCPI χ² (2, N = 47) = 2.82, p = 0.24, M = 50.2; GDS-15 χ² (2, N = 47) = 1.12, p = .57, M = 2); however, the mean depression scores for both – LCPI Depression scale and GDS – 15 were lower in seniors with longer physical activity experience (M = 5.15, SD = 4.18 and M = 2, SD = 1.04, accordingly).

Conclusion. The results of our study indicated no significant differences in depression symptoms in seniors with no mental or behavioural disorder diagnosis in the context of physical activity. Several limitations should be taken into consideration. Firstly, only mentally healthy participants were involved in the study, secondly, the sample was small and gender division was not heterogeneous, thirdly, the physical activity experience was measured with self-report questionnaire that did not involve daily physical activities, e.g. gardening. To fully investigate the effect of physical activity on depression symptoms, further research including clinical group should be conducted.

This study was funded by the Latvian National Research Programme BIOMEDICINE 2014–2017.
COMORBIDITY OF ANXIETY, DEPRESSION AND HYPOCHONDRIASIS IN GASTROENTEROLOGICAL PATIENTS

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Keywords. Hypochondria, hypochondriasis, anxiety, depression, gastroenterology, psychiatry.

Introduction. The significance of mental disorders is likely to be underestimated because of poor understanding of interconnection between mental and physical health. Many health conditions escalate the risk for mental disease, and comorbidity often impedes diagnosis.

Aim. To find a link between anxiety, depression, hypochondriasis, demographics and unhealthy habits in gastroenterological patients.

Materials and methods. During the period from January 2017 to May 2017, a prospective study including gastroenterological patients had been performed in Vilnius University Hospital Santaros Klinikos. Each patient, before undergoing a colonoscopy procedure, had been asked to fill in a pre-compiled questionnaire. The questionnaire comprised questions regarding demographics, unhealthy habits, and concomitant illnesses. Hospital Anxiety and Depression Scale (HADS) and Health Anxiety Self-Assessment (Whitley index) questionnaires were integrated.

Results. The study population consisted of 43 patients (mean age 57.052 ± 17.509 years; 62.8 % males, 38.2 % females). 46.5 % of the patients admitted to consuming alcohol regularly. Alcohol consuming patients had significantly more pronounced anxiety (Cohen-d index 0.73), depression (Cohen-d index 0.62) and hypochondriasis (Cohen-d index 0.76). A connection not only between anxiety and depression symptoms was found (Spearman coefficient 0.312) but also between anxiety and hypochondriasis (Spearman coefficient 0.437). Scale reliability Cronbach's alfa results: anxiety questionnaire 0.631, depression 0.662, hypochondriasis 0.836.

Conclusion. Patients who admitted to consuming alcohol on a regular basis had more pronounced signs of anxiety, depression and hypochondriasis compared to patients who abstain from alcohol. Anxiety had a direct link with hypochondriasis. Quite significant scale reliability was determined, especially hypochondriasis scale. Mental disorder awareness has to be raised between healthcare professionals and incorporated into all aspects of healthcare.
IN-PATIENT BENZODIAZEPINE DETOXICATION: PECULIARITIES OF CONSUMPTION, TREATMENT OUTCOMES

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Keywords. Benzodiazepines, detoxication.

Introduction. Benzodiazepines (BZDs) are a class of CNS depressant drugs. They produce anxiolytic, hypnotic and spasmolytic effects. BZDs are one of most commonly prescribed medicines in Lithuania. Longterm use of these drugs cause dependence, abstinence syndrome develops as a consequence of sudden cessation.

Aim. To analyze benzodiazepine consumption features, determine the most prevalent withdrawal symptom and the outcomes of treatment for in-patient detoxication patients. Determine if a link between diazepam equivalent dose at arrival (DDDA) and dose prescribed at discharge (DDD) exists. Also, establish whether a link between DDDA and time spent at the hospital is present.

Materials and methods. Retrospectively we evaluated 42 patients who had undergone BZD detoxication treatment at Republican Vilnius University hospital during 2011–2017 period. Patients admitted for BZD overdose or those who had been using BZDs for < 5 weeks were excluded from the study. Since patients had used different kinds of BZDs, the doses were converted into diazepam equivalent. Data was processed by SPSS 22.0.

Results. The study population consisted of 42 patients (age median 46 years; 54.8 % females, 45.2 % males). 14 patients had been consuming more than one BZD, consecutively lorazepam was consumed by 19 patients, 17 took clonazepam, alprazolam was consumed by 10, diazepam by 6, and 3 patients took bromazepam. Most prevalent symptom of abstinence was anxiety, which occurred in 23 patients. Average duration of BZD consumption was 13.95 years (SD ± 8.464). DDDA average was 123.27 mg (SD ± 218.968). Mean time of the in-patient treatment was 11.62 days (SD ± 10.516). More than a half of patients (59.5 %) were able to achieve complete abstinence from benzodiazepines and were prescribed none at discharge (DDD = 0). The other 41.5 %, however, have been prescribed doses varying from 5 to 60 mg diazepam and referred to continue treatment in an out-patient setting. To investigate whether there is a statistically significant connection between DDDA and time spent at the hospital, Pearson correlation test was used. Statistically significant connection was not found (Pearson r = −0.113, p > 0.05, p = 0.474). However, a strong positive statistically significant link was found between DDDA and DDD (Pearson r = 0.782, p < 0.05, p = 0.000).

Conclusions. More than a third of patients had been consuming two different BZDs at the same time. Almost half of patients used lorazepam. Second most popular BZD was clonazepam and the least popular was bromazepam. More than half of patients experienced anxiety at the time of admition. Larger part of patients have successfully undergone detoxication and were not prescribed any BZDs at discharge. A strong positive link was found between DDDA and DDD. However statistically significant link between DDDA and time spent at the hospital was not established. Nevertheless, further investigations in the future should be done with larger samples.
THE RELATIONSHIP BETWEEN BURNOUT AND AGGRESSIVE PATIENTS’ BEHAVIOUR AMONG NURSES

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Keywords. Burnout, aggression.

Introduction. Aggressive patients’ behaviour is one of the factors causing high stress levels in hospital environment. As long-term emotional stress could lead to burnout, aggression should be a significant factor causing burnout syndrome.

Aim. To examine burnout prevalence in different hospital units and its possible relation to different forms of aggressive behaviour.

Materials and methods. In cross-sectional study a sample of 101 nurses was examined. A questionnaire was structured of demographic information, a Maslach Burnout Inventory Human Services Survey, which contains 22 questions, and additional 10 short questions about aggressive behaviour from patients, doctors or other nurses. Professional burnout was estimated by evaluating 3 subscales: Emotional exhaustion – low ≤ 16, moderate 17–26, high ≥ 27; Professional fulfilment – low ≤ 32, moderate 32–38, high ≥ 39; Depersonalization – low ≤ 6, moderate 7–12, high ≥ 13. Professional burnout was detected if emotional exhaustion and depersonalization is evaluated as high and professional fulfilment evaluated as low. The work tested the relationship between different forms of aggression and burnout. Statistical analysis was performed with SPSS 17 and Windows Excel programs.

Results. The demographic structure of the sample was 101 woman: 49 from therapeutic units, 22 from surgical units, 30 from reanimation and intensive therapy units. The prevalence of burnout syndrome was 32.7% in therapeutic, 40.9% in surgical and 50% in reanimation and intensive therapy units. The prevalence of different types of patients aggression, revealed by the results, was: 51.5% the verbal abuse, 12.9% physical aggression towards nurses without any injuries, 9% physical aggression towards nurses causing minor injuries and 2% from patients physical aggression towards nurse causing severe injuries. In addition, 49.5% of nurses have felt worried about their safety, talking with aggressive patients and 39.6% were at least once affected by the aggressive patient breakthrough that they thought about after work. Moreover, 30.7% of nurses sustained aggression from doctors and 27.7% from other nurses. Using Probit model statistically significant relation between the dependent dummy variable burnout syndrome among nurses and independent variables, such as verbal abuse with physical effects (p value 0.0102), patients physical aggression towards nurse causing severe injuries (p value 1.6e−195) and sustained aggressive behaviour from other nurses (p value 0.0587), was found.

Conclusion. According to the results of the study, the prevalence of burnout syndrome among nurses in my sample is quite large, as well aggressive behaviour from patients and other co-workers and these two phenomenons are related.
THE INCIDENCE OF BURNOUT SYNDROME AMONG YOUTH CENTRE STAFF

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Introduction. Around 27% of workers in today’s population can be affected by the burnout syndrome. The syndrome occurs due to an increased emotional burden, stress conditions in the workplace. Because the syndrome this way, the quality and performance of the work are sharply reduced, the person becomes demotivated and emotionally stunned, unable to fully perform his duties. According to a research carried out in Latvia, 48% of workers are under constant stress, while 31.2% of workers feel that their emotional state only worsens and one of the most important psycho-emotional risk factors is the direct contact with people who are not their colleagues.

The staff of youth centres plays an important role in society, because it ensures the integration of young people into society, involving them in social activities and organizations and helps to find solutions to the problems of young people.

There are currently 160 youth centres in Latvia.

The aim, materials and methods. The purpose of the study is to investigate the incidence of burnout syndrome among youth centre staff. To find out, the author used an anonymous Google Forms computerized questionnaire, which consisted of demographic questions and the Maslach Burnout Syndrome Scale. The questionnaire was sent to all youth centres’ e-mails that are available at www.jaunatne.gov.lv. The data was compiled using statistical calculations using the following programs: Microsoft Excel; IBM SPSS Statistics 20. The data collection period was from December 2017 until January 2018.

Results. The study was attended by 97 respondents, of which 83 women and 14 men. The median age for women was 31 and 28 for men. Analysing the Maslach Burnout Syndrome Scale subgroups: emotional burnout – with a low emotional exhaustion level of 32.0%, an average of 42.3% and a high of 25.8%, a depersonalization-with a low of 64.9%, an average of 20.7% and a high of 14.4%, personal success- with a low personal success rate is 30.9%, an average of 29.9%, high of 39.2%. No statistically significant difference between genders and age group has been found.

Conclusion. From the results of the study, it can be concluded that the burnout syndrome in this population is present. The results indicate that one third of the respondents have a medium to high-level burnout syndrome.
IMPACT OF SOCIAL ACTIVITY ON COGNITIVE FUNCTION IN PATIENTS OVER 65 YEARS OF AGE

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Keywords. Cognitive function, social activity, Montreal Cognitive Assessment (MOCA) scale.

Introduction. With age gradually decreases number of neurons and deteriorates neuroplasticity. This is known as a normal aging process. Some people undergo this process faster, some – slower. The main question is which factors are able to decelerate cognitive aging. Social activity, new knowledge assimilation and skill development promotes synapses formation in the brain that may slow down the reduction rate of cognitive function.

Aim. To find out and assess the correlation between social activity level and cognitive function in patients over 65 years of age.

Materials and methods. For this research were selected patients from Pauls Stradiņš Clinical University Hospital that were over 65 years of age and without any disorders that could affect cognitive function, including depression. To exclude the depression, was used the “Depression self-assessment test”. If depression was not found, test with Montreal Cognitive Assessment (MOCA) scale was proceeded. The cognitive assessment with MOCA scale was followed up by questionnaire survey about social activity. The obtained data were analyzed in IBM SPSS Statistics 22 software.

Results. 65 patients were evaluated, but 13 of them were excluded due to depression. The definitive number of males (26; 50 %) and females (26; 50 %) included in the research was equal, with the mean age of 74.5 ± 6.7 (SD) years. MOCA scale results in both males (23.0 ± 4.1) and females (22.8 ± 5.5) did not have statistically significant difference (p = 0.804). Analysis showed, that the older patient is, the worse is MOCA scale result (p = 0.005). As to education level, there was found a positive correlation – the higher education level is, the better are cognitive function assessment test results (p = 0.001). Some more statistically significant positive correlations with MOCA scale results were found in patients, who keep on working (p = 0.039) and in those, who continue to educate themselves (p = 0.001). Also better MOCA scale results were associated with higher physical activity level (p = 0.042) and frequent public event attendance (p = 0.034). There was found a weak positive correlation (rs = 0.27) between MOCA score and general health self-assessment rating (p = 0.056), however, it was not assumed to be statistically significant (0.056).

Conclusion. The age, education level, working, lifelong learning, high level of physical activity and regular public event attendance are the factors that have a strong impact on cognitive function in people who are over 65 years of age.
CORRELATION BETWEEN ALEXITHYMIA AND SOMATIZATION AMONG RĪGA STRADIŅŠ UNIVERSITY MEDICAL FACULTY STUDENTS

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Keywords. Alexithymia, somatization, medical students.

Introduction. Alexithymia (which literally means having no words for emotions) has been brought to doctor’s attention because of its newfound association with different psychiatric disorders, including somatization, as well as other medical conditions, such as cardiovascular and gastrointestinal disorders. Nevertheless, alexithymia hasn’t been classified as a mental disorder neither in ICD-10, nor in DSM-IV. It has been explained that alexithymic individuals have somatic complaints as a result of prolonged state of emotional arousal. It is in our scope of interest to find out if medical students (MS) suffer from somatization as a side effect of increased emotional stress and if it is connected with inability to express their own feelings.

Aim. The aim of this study is to find out if there is a correlation between somatization and alexithymia among Rīga Stradiņš University Medical faculty students.

Materials and methods. In this cross-sectional study, medical students from 1st till 6th year were asked to fill the self-report questionnaire electronically on voluntary basis. Questionnaire consisted from internationally validated TAS 20 (Toronto Alexithymia Scale) and 4DSQ (Four-Dimensional Symptom Questionnaire), it also included questions about current diseases and use of medication to exclude other health problems. SPSS for Windows was used to perform all statistical analyses.

Results. Altogether responded 224 medical students. According to the TAS 20 cut off point 14.7% (n = 33) of MS have alexithymia, 27.7% (n = 62) alexithymia is mild and in 57.6% (n = 129) have no alexithymia. From 4DSQ results 49.6% (n = 111) MS have mild and 5.4% (n = 12) have severe somatization. From all respondents 26.3% (n = 59) had chronical illnesses. MS with chronic illnesses 26.3% (n = 28) have alexithymia, correlation coefficient (CC) 0.35 (p = 0.007), while in MS without chronic illnesses 40% (n = 66) have alexithymia (CC 0.215, p = 0.005). Results showed weak correlation between alexithymia and somatization in MS without chronic illnesses (p = 0.005).

Conclusion. Results of this study showed that there is weak correlation between alexithymia and somatization in medical students. The prevalence of alexithymia was slightly higher in student group with chronic illnesses, but there was no statistically significant difference with student group without chronic illnesses.
HEALTH DIFFERENCES AMONG LATVIAN AND INTERNATIONAL MEDICAL STUDENTS

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Keywords. Latvian medical students, international medical students, PHQ-D, negative emotions, medical anthropology, psychosomatics.

Introduction. Medical students are known to have significantly higher health-related symptoms than the general population. Gender, learning styles, university curriculum and a lack of social interaction are known as contributing factors. Less research focuses on the ethnic and cultural background. To our knowledge no research has shown the prevalence and differences between local and international students in Latvia.

Aim. The aim of this research is to show the prevalence of health-related symptoms (physical symptoms, depressive symptoms, anxiety) and their emotional coping.

Materials and methods. An online-based questionnaire was distributed among medical students in Riga, Latvia. The mental and somatic symptoms were screened with the PHQ-D Option C (PHQ-15, PHQ-9, GAD-7) for depressive symptoms, somatic symptoms and anxiety. Medical students were divided up into three groups according to their answers: Group A: no symptom, group B: mono symptom, group C: multi symptoms. A general questionnaire and a questionnaire regarding the coping with negative emotions to stressful-life events was distributed.

Results. 167 valid answers were obtained. 67 (40.1%) participants were Latvian students. 100 (59.9%) were international students. 23 (34.3%) Latvian students were in group A, 20 (29.9%) in group B, 24 (35.8%) in group C. 51 (31%) international students were in group A, 34 (34%) in group B, 14 (14%) in group C. Latvians displayed more statistically significant health-related symptoms (p = 0.003). Students displayed troubles adjusting to negative emotions.

Conclusion. Medical students in Latvia have a high prevalence of health-related symptoms. Latvian medical students display more health-related symptoms. Further research needs investigate whether Latvians have a lower threshold for stressors or whether they are exposed to more stressors than international students.
HEALTH ISSUES IN MEDICAL STUDENTS: PREVALENCE & ASSOCIATIONS

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Keywords. Medical students, psychosocial factors, PHQ-D, emotions, mental health, physical health, psychosomatics.

Introduction. Medical students are known to have significantly higher health-related symptoms than the general population. Gender, learning styles, university curriculum and a lack of social interaction are known as contributing factors. Psychosomatic Medicine deals with the biological, personal, interpersonal and social component of health. At the core of these entities are emotions and their conflicts. To our knowledge no research has investigated the acknowledging of negative emotions as a contributing factor for health-related symptoms.

Aim. To assess the prevalence of health-related symptoms in medical students and the association with acknowledging negative emotions.

Materials and methods. An online-based cross-sectional questionnaire was distributed among medical students in Riga, Latvia. The mental and somatic symptoms were screened with the PHQ-D (PHQ-15, PHQ-9, GAD-7) for depressive symptoms, somatic symptoms and anxiety.

Medical students were divided up into three groups according to their answers: Group A: no symptom, group B: mono symptom, group C: multi symptoms. Symptoms of adjustment disorder to a stressful life event were screened with the ADNM-6. A general questionnaire regarding the parameters of students was distributed as well.

Results. 167 answers were valid. 63 (37.7 % (95 % CI = 30.7–45.3)) reported somatic symptoms, 48 (28.7 % (95 % CI = 22.4–36.3)) reported depressive symptoms and 35 (21 % (95 % CI = 15.5–27.8)) reported anxiety. These symptoms were comorbid in 38 (22.8 % (95 % CI = 17.1–29.7)), while 54 (32 % (95 % CI = 25.7–39.76)) of students displayed mono symptoms. 65 (63.1% (95 % CI = 53.5–71.8)) agreed that the life event was a strong burden to them, 63 (61.2 % (95 % CI = 51.5–70.0)) were wondering whether it could happen again to them and 73 (70.9 % (95 % CI = 61.5–78.8)) of these students tried to suppress their emotions due to the personal burden. Students who mentioned a stressful life event displayed less health-related symptoms (p = 0.010).

Conclusion. Students who mentioned a stressful life were linked to a reduction of health-related symptoms. Arguably, mentioning a stressful life event can be understood as acknowledging negative emotional experiences and thereby reduce health-related symptoms. Teaching medical students to acknowledge their negative emotional experiences could have a positive impact for their health and future patient-doctor relationship.
X PUBLIC HEALTH, OCCUPATIONAL MEDICINE, NUTRITIONAL SCIENCE, REHABILITOLOGY

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STRESS LEVELS AMONGST FAMILY DOCTORS IN LATVIA

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Keywords. Stress survey, family doctor, stressors.

Introduction. Stress is biological response to a stressor–some environmental condition. High long-term stress can lead to allostatic shift in bodily functions. Doctors experience high stress levels every day. British National Health Service (NHS) revealed that their General practitioners stress level are so high, that almost 30% plan to quit in the next five years. Such big crisis might not affect Latvia, but recent family doctor strike and negative feedback in media about implementation of E-veselība revealed major dissatisfaction about their work.

Aim. Evaluate stress level of family doctors in Latvia, find possible stress causes, and ask their opinion on how to improve their work environment.

Materials and methods. Surveys were sent electronically to family doctors in Latvia. The survey consisted of personal data part, created by authors, and stress evaluation part. For stress evaluation, we used Perceived Stress Scale (1983), that valuates stress level from 10 (lowest) to 50 (highest) points and divides stress levels in low (10–23 points), average (24–36 points) and high (37–50) level.

Results. We gathered data from 115 family doctors – 100 (87 %) of them were woman and 15 (13 %) were men. 23 of doctors have their family practice in Riga, 65 in other towns, 27 were located outside of town. Average stress levels amongst Riga’s doctors were 31.26 points on the stress scale, amongst other town doctors – 30.82 points, but doctors working outside of town showed 31.81 points on the stress scale. Male doctors scored 29.4 points on the stress scale, but female doctors showed higher stress rate of 31.4 points. Often sensation of burnout syndrome mentioned 49 doctors and showed an average of 34.86 points on the stress scale, occasional sensation–60 doctors with average 29.28 points on the stress scale, but no sensation of burnout mentioned 6 doctors and scored 19.33 points on the stress scale. Total number of doctors experiencing high stress levels was 23, average stress level showed 77 doctors, but low-level reported 15 doctors. Widowed doctors (N = 7, Average age 61) showed highest stress levels – 34.57 points, divorced (N = 14, Average age 57) stress was 32.07 points, civil marriage (N = 13; Average age 49.85) – 31.54 points, unmarried doctors (N = 14, Average age 47) –31.29, married doctors (N = 66, Average age 51.67) had the lowest stress – 30.74 points.

Conclusion. Doctors working outside of towns experienced slightly higher stress levels. On average, male doctors show lower stress levels than female. More often, the sensation of burnout syndrome correlates with higher average stress levels. Widowed doctors showed highest stress levels.
USE OF HAND DISINFECTANTS AND RELATED HAND-SKIN PROBLEMS FOR HEALTH CARE WORKERS

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Keywords. Disinfectants, hand skin problems.

Introduction. Health care workers hands are one of the main mechanisms of transmission of nosocomial infections, proper hand hygiene can reduce the spread of infection by 40%. It is very often not carried out in such a way that hand disinfectants caused by medical personnel hand dermatitis, which is one of the most important health problems of health workers especially nurses alike. This disease can be difficult and long to be cured, rarely curable and can become a long-term illness with frequent relapses. Hand dermatitis is the result of irritating contact dermatitis or allergic contact dermatitis. Clinically hand dermatitis manifests itself as dry skin, redness of the skin, uneven rough skin, and skin with cracks.

Aim. The aim of this study is to find out which health care workers (doctors, nurses, nursing assistants) occurs most often hand skin lesions, which are most often carried out hand disinfection and what is the relationship between the specific use of disinfectant and hand skin change.

Materials and methods. 86 health care workers who worked at the 2nd hospital in Riga for hand disinfection habits were interviewed using an anonymous questionnaire and processed and analyzed data obtained.

Results. It was interviewed 42 nurses, 42 nursing assistants and 2 doctors. 100% of the doctors, nurses perform hand disinfection, 90.5% of nursing assistants perform hand disinfection. Skin changes after hand disinfection are observed in 81.0% of nurses and 61.9% of nursing assistants. The changes observed in the health care workers by the hand skin were 65.9% dry hands, 20.5% inflamed hand skin, 11.4% skin peeling, 2.3% allergy to disinfectant. An alcoholic disinfectant is used 30.2%; antiseptic soap is 20.9%, both of which are used by 48.8%. There are no significant differences between the disinfectant and the resulting dry hands skin. There are no significant differences between the disinfectant and the subsequent hand peeling skin. Inflamed hand skin is caused by 23.1% using an alcohol-containing disinfectant, 28.6% using both alcohol-based product and antiseptic soap and 0.0% using antiseptic soap (p <0.05).

Conclusion. Health care workers more often choose to use hand disinfection alcohol-containing disinfectants along with antiseptic soap. Skin changes after hand disinfection are more common in nurses. The most common problem caused by disinfectants is dry skin and is equally common among all disinfectants.
THE CHARACTERISTICS OF THE DEVELOPMENT OF GONARTHROSIS AND COXARTHROSIS DEPENDING ON THE PATIENT’S OCCUPATION

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Keywords. Coxarthrosis, gonarthrosis, etiological factors, occupation.

Introduction. Gonarthrosis and coxarthrosis are common disorders of the elderly patients. Osteoarthrosis prevalence increase among patients older than 50 years. This disease has many etiological factors, but most important of them are- age, obesity and heavy physical work.

Aim. The aim of our study is to find out and analyze how many patients have hazardous work risk factors what could be cause of gonarthrosis and coxarthrosis.

Materials and methods. We conducted a retrospective cohort study using a questionnaire with a sample size of 100 subjects. The questionnaire contained various questions about risk factors in patient’s lives. Data was analyzed using SPSS and Microsoft Excel.

Results. There are 27% of man of which 40.7% with gonarthrosis and 44.4% with coxarthrosis, but with both - 14.8%. And there are 73% of women of which 54.8% with gonarthrosis, 38.4% with coxarthrosis, with both - 8.8%. Hazardous work risk factors have 85% of the respondents: weight lifting, vibration, frequent leaning, working in a tense posture, doing heavy manual work while standing, and working in very cold or very hot environments. Other noteworthy factors are obesity (some patients have diabetes mellitus) and age (older than 50 years).

Shift job worked 18%. Before is being done a joint endoprosthesis, 93% of respondents have been treated with medication, physiotherapy or sanatorium. Occupational disease is arranged 16% of respondents: 9% of the patients have second disability group, 14% – 3rd.

Conclusion. Our hypothesis was confirmed – 85% of the patients had work risk factors for osteoarthrosis. More attention must be paid to hazardous work risk factors which could be one of the causes of deforming osteoarthrosis.
DENTISTS' HEALTH INFLUENCING PSYCHO-PHYSIOLOGICAL FACTORS DURING WORK

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Keywords. Psycho-physiological factors, dentist, health, ergonomic, posture.

Introduction. During the research, 150 dentists were interviewed. The main objective of this research is to find out and study problems for professional dentists. Comprehensive data and personal dentists’ references were obtained. In dentists’ job, there are several psycho-physiological factors that affect their health. According to the results, it is possible to subjectively evaluate the situation among dentists in Latvia. The results from this study coincide with several researches made by other scientists in terms of this subject. In general, their results are similar to the conclusions of this work.

Aim. The aim is to examine problems, which affect professional dentists’ health, using survey results and other authors’ researches.

Material and Methods. Empirical data collection method was applied. A survey with 15 questions about the topic: “Is it healthy to be a dentist?” was made, and 150 dentists were interviewed to determine, how working conditions affect dental health.

Results. 30% of respondents have more than 20 years of work experience. 25% of respondents have 10–20 years of work experience, but for 45% it is less than 10 years. Respondents were aged between 22 and 73 years, but work experience ranges from 6 months to 49 years. 66.6% of the interviewed are women, but 33.3% are men. 7.7% work less than 20 hours per week, 28.2% work 20–30 hours per week, 20.5% of the interviewed work 30–40 hours per week, 38.5% work 40–50 hours per week, and 5.1% work more than 50 hours per week. 90% of dentists feel pain after work. The pain is mostly located in the back (respondents note that in lumbar and neck regions pain focuses the most), head, arms and legs.

Conclusion. In dentists’ work, there are many professional psycho-physiological factors, which heavily influence dentist’s health. Surgical Dentists usually stand while working, but dental therapists are sitting, but almost all the time they occupy awkward and uncomfortable sitting posture. Despite the fact that dentists work in well-lit rooms, more than one third notices vision decrease.
THE PREVALENCE OF CARPAL TUNNEL SYNDROME IN MUSIC TEACHERS IN COMPARISON WITH THE GENERAL POPULATION

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Keywords. Carpal tunnel syndrome (CTS), occupational and environmental medicine, music teachers.

Introduction. Carpal tunnel syndrome is a compressive neuropathy of the median nerve (n.medianus). The carpal tunnel is between the middle part of retinaculum musculorum flexorum and sulcus carpi. The symptoms of CTS are numbness, weakness, tingling in the palm of the hand and the fingers. The music teachers have an increased risk of developing carpal tunnel syndrome due to increased use of the hands.

Aim. The goal of the research is to compare the prevalence of carpal tunnel syndrome in music teachers and the general population.

Materials and methods. To investigate this matter, questionnaires were used, in which the music teachers were asked how many hours they spend playing on the musical instruments every day. Physical tests were also used such as Phalen’s sign test and Tinel’s sign test. We used IBM SPSS platform for statistical analysis.

Results. 73 teachers were included in our study (8 men and 65 women). Among 73 teachers, there were 32, who played on string instruments, 8 on wind instruments, 14 on keyboard and 19 on percussion instruments. Age ranged from 23 to 72 years with 51 as mean age. Average work experience was 25 years with 3–4 hours of instrument playing per day. From 73 people questioned 16 confessed that they had symptoms and further 9 of them had positive physical tests. 7 of these patients were string instrument teachers, one was a keyboard and one was a percussion instrument teacher. This allows to hypothesize, that percentage of music teachers having potential carpal canal syndrome (12.3%) is much higher, than percentage of workers, who registered carpal syndrome in Latvia (0.0487%) and compression neuropathy (which includes carpal syndrome) (0.09589%). String music teachers have higher (21.9%) risk than all other groups - wind instrument teachers (0%), keyboard instrument teachers (7.1%) and percussion instrument teachers (5.3%)

Conclusion. Music teacher is a profession with a high risk for a carpal canal syndrome. Data analysis shows, that music teachers have much higher risks of having compression neuropathies and carpal syndrome than other average worker. Analysis allows us to acknowledge, that string instrument teachers are in the highest risk group among the other music teachers. Unfortunately, physical tests do not have 100% specificity and sensitivity. Another problem is that there are many unregistered patients with carpal tunnel syndrome and other occupational diseases. A larger sample size would allow for higher quality analysis and results that are more accurate.
VISUAL SYMPTOMS IN OFFICE WORKERS RELATED TO COMPUTER USAGE

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Keywords. Vision, computers, office workers.

Introduction. Nowadays computers are used on a daily basis both at work and off hours. Consequently, the number of office workers complaining about vision symptoms like tired eyes, irritation, etc. is increasing. These symptoms form Computer Vision Syndrome which is experienced by up to 90% of computer users.

Aim. To evaluate the prevalence of visual symptoms associated with computer usage in office workers and to determine the association of these symptoms with socio-demographic factors.

Materials and methods. In a prospective study, 202 office workers in Latvia were selected. A questionnaire was conducted which included questions about socio-demographic factors, also questions describing ocular discomfort (Total Symptom score – TSS) by Hayes et al. was included. The Ocular Surface Disease Index (OSDI) survey was also incorporated. Collected data were analyzed with IBM SPSS using descriptive statistical methods with confidence interval (CI) of 95%.

Results. 202 office workers from which 39 (19.3%) were male, 163 (80.7%) female. Mean age was 30.08 (95% CI = 28.8–31.3), median age 26.

Mean number of hours spent on a computer at work was 6.6 (SD = 2.8; 95% CI = 6.3–7.0). 138 (68.3%) respondents reported that they do not use any type of refractive correction while working on computer, 39 (19.3%) uses glasses, 11 (5.4%) – contact lenses and 14 (6.9%) – both. While working, 56 (27.7%) respondents reported using rewetting drops.

The median TSS was 9.0 (interquartile range (IQR) = 14.0–6.0; overall range 0–35). Median OSDI score was 12.5 (IQR = 22.9–12.5; range 0–77.08). Using OSDI score 44.6% of subjects were classified as having normal ocular surface, while 27.7%, 13.9% and 13.9% had mild, moderate and severe symptoms. Comparing OSDI and total symptom scores, there was a positive correlation between them (Spearman rs = 0.74; p < 0.001).

The most frequently reported symptoms at least half of the time over the past week were tired eyes (39.2%), eye discomfort (24.7%), blurred vision when looking into the distance after computer work (21.7%) and dry eyes (21%).

There was not found significant correlation (p > 0.05) between OSDI or total symptom score and age, gender, smoking status, hours spent on a computer at work, usage of refractive correction or rewetting drops or underlying ocular diseases.

Conclusions.

1. Although office workers experience visual symptoms, there is no correlation with them and socio-demographic factors.
2. The most frequently reported symptoms at least half of the time over the past week were tired eyes, eye discomfort and dry eyes.
MUSCLE LOAD AND DISCOMFORT OF SMARTPHONE USE ON UPPER EXTREMITY

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Keywords. Smartphone, muscle load, discomfort.

Introduction. Today, smartphones are used daily. In fact, the number of smartphone use in the world is expected to surpass five billion by 2019. However, the use of them requires repeated muscle work of upper extremity (UE). Some authors claim that frequent use may cause discomfort and pain. Another study suggests that exercises may reduce UE symptoms. Today, we need more knowledge about physical changes in muscles during use of smartphones to understand how to prevent UE muscle load (ML) and discomfort.

Aim. The aim of this study was to evaluate the ML for different UE muscles, and to compare the total ML and discomfort before and after different habits of smartphone use.

Materials and methods. Two asymptomatic females volunteered, with a mean age 26-year-old. The volunteers sat in a chair with a flexed elbow, holding a smartphone with their dominant hand without support. The surface electromyography (EMG) for muscle fatigue evaluation was recorded on eight UE muscles of the dominant limb during the tasks. The volunteers typed an English text for 6 min using one hand. The same task was repeated 3 times, first without rest, and second time with a 5-min rest after 3-min. On the third trial the subjects were told to perform UE stretch exercises instead of rest. Visual analogue scale (VAS) was given to the subjects before and after each of the trials for UE discomfort evaluation.

Results. The greatest ML was observed in the abductor pollicis longus on the dominant hand, followed by wrist extensors and flexors. The VAS evaluation suggested a significant UE discomfort after having a 5-min break between smartphone use, whereas continuously 6-min smartphone typing gave least discomfort. In contrast, the EMG result showed a lower ML after having 5-min rest between smartphone use, and increased load after 6-min of uninterrupted smartphone use.

Conclusion. This study shows that different habits of smartphone use significantly influence UE muscle discomfort and load. A small break between smartphone use may give the UE muscles possibility to rest, thus easily decrease the ML when returning to the smartphone. However, further studies are needed to find the optimal pattern of smartphone ergonomics.
REDUCE LONELINESS BY ELDERLY PEOPLE WITH DEMENTIA IN A RESIDENTIONAL CARE SETTING

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Keywords. Loneliness, dementia, intergenerational activity, individual conversations.

Introduction. There is no conclusive solution about reducing loneliness. Possible solutions depend on the person, the type of loneliness, his environment. The scientific literature agrees that further research must be done on this subject.

Aim. This research will test the influence of intergenerational activities and individual conversations on the loneliness of residential elderly with dementia.

Materials and methods. Loneliness of the elderly is measured with the ‘De Jong Gierveld eenzaamheidsschaal’ and the QUALIDEM observation scale. Both scales are taken before and after the activities and conversations. Four activities are organized. The interaction between the elderly and the children (toddlers) is encouraged. In two activities, the elderly goes to the kindergarten, while in the other two activities the children come to a residential care center.

Results. Loneliness is an experience of the elder which was difficult to measure. This was even more difficult with elderly people with dementia, because of the different moments of dementia. The elderly who were examined in the study experience both emotional and social loneliness. With emotional loneliness, it was about missing a partner they have lost. Social loneliness was more about missing the family and wanting to return home. Individual conversations gave them a positive feeling. They told about their feelings, their past, things or people they miss... Every older person looked forward to a weekly individual conversation. Children clearly had a positive influence on the elderly. Some elderly people independently sought an interaction with the children, others started laughing when the interaction was stimulated. Afterwards, these activities also stayed longer in the memory of the elderly than other ‘ordinary’ activities. During the activities, photos were taken of the elderly and the children. During the individual interviews, these photos were shown on an Ipad. The elderly spontaneously started to laugh again and told about their experience.

When administering the assessments at the end of the study, the questions about loneliness had a negative influence on the mood of the elderly.

Older people indicated loneliness more quickly by themselves with De Jong Gierveld ‘eenzaamheidsschaal’, than that the QUALIDEM can prove this or can further support it.

Conclusion. Loneliness is a subjective concept that is difficult to measure, especially by elderly people with dementia. Individual conversations and intergenerational activities have a positive influence on the feelings of the elderly but do not affect loneliness.
IDENTIFICATIONS OF THE MOST COMMONLY USED COMMUNICATION DISORDER ASSESSMENT TOOLS, COMPARISON OF CONTENT AND PSYCHOMETRIC PROPERTIES: A SYSTEMATIC LITERATURE REVIEW

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Keywords. Communication, communication disorders, outcome assessment, treatment assessment, ICF, Psychometric properties.

Introduction. Communication disorders are difficulty to receive, transmit, process and understand verbal, non-verbal and figurative symbol system. Referring to the National Institute for Deafness and Other Communication Disorder (NIDCD) statistics, they are becoming more common worldwide every year. Communication disorders are categorized by severity from mild to deep, and they can be acquired or inherited. Also, there are several communication disorder groups–speech impairment, language disorder and hearing impairment. Therefore, in order to evaluate which activities should be included in rehabilitation programs, it is necessary to determine the nature of the disorder. A specific assessment tool is needed to assess such kind disturbances.

Aim. To find out the most commonly used communication disorder assessment tools for adults, compare their content using the International Functional, Disability and Health Classification (ICF), and psychometric properties.

Materials and methods. Systematic literature review in three parts. Identification of the most commonly used communication disorder assessment tools in clinical trials. Linking the meaningful items of the most commonly used communication disorder assessment tools to the categories of ICF.

Results. During the systematic literature review, 44 clinical studies were selected using a structured search strategy. In total, there were identified 52 communications disorder assessment tools, from which the 5 most frequently used instruments are analyzed further. The most commonly used communication disorder assessment tool in selected studies is The Boston Naming Test (BNT), the second most commonly used is Western Aphasia Battery (WAB), third Aachen Aphasia Test (AAT), fourth–Boston Diagnostic Aphasia Examination (BDAE), and fifth–National Institute of Health Stroke Scale (NIHSS). The meaningful items identified in the assessment tools are linked to the 30 categories of ICFs. All meaningful items identified in the tools are linked to the category “Body Functions” of the ICF, and primarily refer to domains that relate to the individual’s speech and language functions. Only one of the identified tools (NIHSS) evaluates the functional effects of the disease (in this case, stroke), including vision, sensory sensations, muscular strength in extremities, etc. Four assessment tools (WAB, AAT, BNT, BDAE) are intended for speech and language disorders of aphasia or other neurological diseases.

Conclusion. The systematic literature review identifies the 5 most commonly used communication disorder assessment tools. All five tools are designed to assess neurological communication disruptions. The meaningful items of the tools are linked to the category “Body Functions” of the ICF, and primarily refer to domains that relate to the individual’s speech and language functions. Only one of the identified tools (NIHSS) evaluates the functional effects of the disease (in this case, stroke), including vision, sensory sensations, muscular strength in extremities, etc. Four assessment tools (WAB, AAT, BNT, BDAE) are intended for speech and language disorders of aphasia or other neurological diseases.
DRAMA THERAPY GROUP FOR DEVELOPING
COMMUNICATION COMPETENCES FOR PERSONS
WITH VISUAL DISABILITY

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Keywords. Drama therapy, visual disability, blindness, communication competences.

Introduction. Researchers stated that absence of visual clues in the environment for visually impaired persons constrains their interpersonal communication. There is no any research in Latvia in connection with the communication competences of this patient group and there is no research in Drama therapy. In “The description of the expanded approved medical technology “Drama therapy”” (Mārtinsone, 2010), the optic nerve damage with pronounced visual impairment is included in the Drama therapy contraindications, but according to the theoretical approaches of Drama therapy, this specialization of Art therapy create space for simulating a real-life situation, using communication and interaction through roles and dialogues, that could help to develop communication competences for blind people.

Aim. To find out whether Drama therapy improves the communication competences for people with visual impairment, from which the fundamental research question arises–Do Drama therapy statistically significant increase the average of communication competences in the group of people with visual impairment.

Materials and Methods. At the beginning of study 115 respondents agreed to participate. They were clients of Rehabilitation centre of Latvian Society of the Blind (LNBRC) aged 18–65 (48 males and 67 females). In the following study participated 60 persons, which indicated scores under the average of communication competences according to the SPCC. Latvian version of Self-Percieved Communication Competence Scale, SPCC, was used as a measure. Subsequently, these participants were divided randomly into n = 30 Treatment group and n = 30 Control group. The study participants received 10 Drama therapy sessions in the Treatment group. The duration of one session was 90 minutes. After the Drama therapy in the Treatment group, both the Treatment group and the Control group responded verbally to Latvian version of SPCC–the obtained data were compared with measurement 1. There were used descriptive (Mean arithmetic, Quartile, Median, Standard Deviation) and conclusive statistics (Student’s t-test).

Results. Comparing the two groups after Student’s t-test in measurements 1 and 2, the results confirmed that statistically significant (p < 0.05) increases communication competences in all categories of SPCC after Drama therapy intervention in the Treatment group of persons with visual disability, but in Control group results indicated statistically significant (p < 0.05) reduction of communication competences.

Conclusion. The research goal was achieved. On the basis of the results, it would be advisable to edit the list of contraindications for the medical technology “Drama therapy”, which could help people with visual disability to increase the possibilities of rehabilitation services in Latvia.
RELATION BETWEEN MOTIVATION, INDEPENDENCE AND DAILY ACTIVITIES AFTER STROKE

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Keywords. Occupational therapy, functional independence, daily activities, motivation, stroke.

Introduction. Stroke cause decreased functional independence level and restriction in daily activities, which is affecting the level of motivation.

Aim. To analyze the relations between functional independence, daily activities and motivation of patients after stroke.

Materials and methods. Totally, 30 people after stroke participated in research during years 2016–2017. The first assessment was performed at the beginning of inpatient rehabilitation in the Centre of Rehabilitation, Physical and Sports Medicine, Vilnius University Hospital. The second assessment was performed after 15 Occupational therapy (OT) sessions. For evaluation of motivation level, Recovery Locus of Control (RLC) and Volitional Questionnaire (VQ) were used. Depression and anxiety level was evaluated using Hospital Anxiety and Depression scale (HAD). For evaluation of patient mental level Mini-Mental test (MMSE) was used. Functional Independence Measure(FIM) and Daily Activities test (DAT) was used to find out the level of capability.

Results. During OT sessions, the level of patients’ abilities and achievements have improved. They have become more active and motivated in OT activities and have been trying to succeed improvement and recovery of functional level in ADL (P < 0.05). Depression and anxiety level of patients have not changed significantly (P > 0.05) however, was observed slight decreasing of anxiety and patients felt more self-confident (P < 0.05). Functional independence level and participation in daily activities of patients were significantly improved during OT and patients have fully agreed that improvement and recovery depends directly on their own contributions. (P < 0.05).

Conclusion. The present study indicates that patients after stroke have different level of motivation, which causes a big difference for the functional recovery result and daily living implementation.
A THERAPEUTIC STEP-BY-STEP PLAN FOR OFFERING MOTOR IMAGERY TO ADULTS IN REHABILITATION AFTER A CEREBROVASCULAR ACCIDENT

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Keywords. Motor Imagery, rehabilitation after CVA, therapeutic protocol.

Introduction. In order to meet specific needs of the target group and to support the pursuit of optimal functioning, an alternative strategy used during rehabilitation after a CVA can be mental motor representation, more specifically Motor Imagery (MI). This is the mental representation of a physical movement or task without actually performing it, with the aim of improving the performance of motor skills. The technique increases the effects obtained by physical training and offers more training possibilities.

Aim. To create a more concrete treatment plan that provides structure for the provision of MI and enables more therapists to follow and implement the different steps in the process of (Graded) Motor Imagery.

Materials and methods. It concerns a qualitative study. A total of six patients were selected to try out the steps in the treatment process. They were prepared for executing Motor Imagery and were taught the technique. The use of an app (Recognise Hand) is integrated in the protocol, because of the prove that virtual reality has an influence on the performance and motivation of the patients. Patients received individual MI sessions, first guided and then without supervision. They were followed up through conversations and kept diaries. They were taught how to do MI themselves in daily life, so they are able to do this after the rehabilitation.

Results. The result of this study was a step-by-step plan where therapists can rely on when problems occur. For ten weeks, the protocol was tested in the rehabilitation center. The therapists kept notes about the execution of the Motor Imagery and working with the protocol. To detect gaps in the protocol and indicate possible improvement possibilities, a questionnaire was drawn up. Results will be known in March.

Conclusion. A step-by-step plan or protocol can help therapists to gain insight into the way in which the technique is applied to patients. In the rehabilitation center was indicated that there was a need for a fixed structure for the therapists, a certain method when offering and learning Motor Imagery to the patients. It was intended to involve as many team members as possible in the entire MI process. Through such a protocol the knowledge increases in different therapists and more people can offer the therapy, what benefits the rehabilitation of stroke patients.
PHYSICAL ENVIRONMENT ASSESSMENT TOOL CONTENT AND PSYCHOMETRIC QUALITY COMPARISON: SYSTEMATIC LITERATURE REVIEW

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Keywords. physical environment, physical environment assessment tool, ICF, psychometric qualities

Introduction. People with functional disorders have a reduced ability to get involved and perform important activities, including self-care and other daily activities. Various environment adaptations could positively enhance relationships by minimising dependency on others and improving social activities outside home. A special assessment tool is needed to assess the physical environment of patients. Latvia hasn’t formally and culturally adopted a common tool for assessing physical environment.

Aim. To determine the most frequently used physical environment assessment tools, compare content, using the International Classification of Functioning, Disability and Health (ICF) and their psychometric qualities.

Methods. Systematic review of literature, identifying the most commonly used physical environment assessment tools, linking their meaningful elements to the categories of ICF. Analysis of the psychometric properties of the most commonly used physical environment assessment tools.

Results. 11 physical environment assessment tools have been identified in the systematic literature review. For the deeper analysis, 7 most commonly used tools (Housing Enabler (HE), Home Safety Self-Assessment Tool (HSSAT), Activities of Daily Living (ADL), Home Falls and Accidents Screening Tool (HOME FAST), Senior Walking Environmental Assessment Tool (SWEAT), Usability in My Home, Fall Risk Assessment tool (FRAT)) have been selected. The meaningful concepts, identified in the instruments, are linked to 52 ICF categories (Body functions n = 7, activities and participation n = 28, environment categories n = 17). Meaningful concepts only from 3 physical environment assessment tools – HE, FRAT and SWEAT were linked to the body functions categories.

The prevalence of meaningful concepts of activities and participation categories is high for HE, ADL and HSSAT. The predominance of environmental factor categories is observed in HE and Usability in my home.

Psychometric properties were evaluated for 7 physical environment assessment tools. Interrater reliability has been proven for all selected instruments. Reliability with a test / retest method is demonstrated by ADL (0.93) and HSSAT (0.97). For all instruments, except for SWEAT, validity and responsiveness have been identified.

Conclusion. The most commonly used physical environment assessment tool is HE, but it requires specific knowledge to use it. The contents of 7 commonly used physical environment assessment tools were compared using ICF, and their psychometric qualities were identified.
THE OPINION OF MEDICAL, FUNCTIONAL AND EDUCATIONAL SPECIALISTS ON THE POTENTIAL USE OF INTERACTIVE EDUCATIONAL TOY “CUBIES” FOR CHILDREN WITH HEALTH PROBLEMS: A QUALITATIVE RESEARCH

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Keywords. Children, disability, educational toy, specialists.

Introduction. “Cubies” is an interactive educational toy invented by Latvian manufacturers. According to our previous research, this toy can be successfully used amongst 3–7 years old healthy children of both genders.

Aim. To identify the groups of children with specific health problems, that could potentially benefit from using “Cubies” toy for therapeutic or developmental purposes in subsequent clinical studies.

Materials and methods. Thematic analysis of structured focus groups’ interviews: Group A (six doctors–specialists in children neurology and psychiatry), Group B (six educational specialists from kindergartens) and Group C (six functional specialists). Specialists were sampled using a maximum variation strategy, varying on age, gender, years of practice, specialty.

Results. The specialists propose that “Cubies” toy can be used for developmental purposes both with healthy children and those with mental or neurological health problems. With potentially maximum benefit the toy can be offered to children with mild mental retardation, autistic disorder, developmental disorders of scholastic skills, specific developmental disorders of speech and language, specific developmental disorder of motor function, developmental delay. Toy can be used as an additional tool during lessons with speech therapists. Developing of additional task-book for logopaedic lessons would improve the effectiveness of usage of the toy. For more productive usage in clinical studies, the volume of loudspeakers must have feasibility of regulation; pace of speech of the storyteller and the length of a story should vary depending on the age of children, and for children with impaired motor skills a bigger toy is advisable. Pictures on cubes must be more schematic and stylized for better recognition.

Conclusion. The potential groups of children with specific health problems who could get developmental benefit from using the toy have been identified. The suggestions for toys’ prototype improvement have been formulated. Acquired information will be used in planning and organizing subsequent prospective studies related to the developmental and therapeutic effect of the “CUBIES” toy.
EFFECTIVENESS OF KINESIO TAPING METHOD FOR WOMEN WITH ACQUIRED FLATFOOT DEFORMITY

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**Keywords.** Kinesio taping, flat foot, feet pain.

**Introduction.** Flat foot – is a foot deformation, which is established in 37–50% population in Lithuania, and among elderly reaches 80%. When the foot is deformed, people can feel feet pain. Foot deformation and foot pain can be reduce by kinesio taping method. Scientifically proven that taping improves joint mobility, normalizes muscle tone, reduces pain, and also helps to avoid bigger feet deformations. Scientists emphasize that in the presence of irregular foot conditions, bones are deformed, so it is important to start correction as soon as possible in order to reduce deformation.

**Aim.** To analyze the effect on pain reduction of kinesio taping method on adults, with the gained flat foot.

**Materials and methods.** Used methods: questionnaire, feet plantogram, navicular drop test and foot function index (pain assessment). Type of research – quantitative. The mean age of the subjects was 26 ± 1.9 years. The study was conducted in August to October 2017 (6 weeks), at the Klaipeda University. The study involved 24 women with flat foot deformation, who were divided into two groups equally: control group – no kinesio taping and experimental group – kinesio taping was applied once a week. Women met the selection criteria when they had first, second, third degree of flat foot; had no foot injuries before; non-allergic to kinesio taping; felt the pain of the feet.

**Results.** The assessment of the foot arch in both groups showed that 75% of the subjects had first-degree flat foot deformation and 25% of the subjects had a second degree flat foot deformation. The assessment of the navicular drop test in both groups, according to test standards, showed that most of the subjects had normal feet on the right side and the left side of the foot was hyperpronated. In the experimental group, 63% of the subjects had hyperpronation and 37% of the subjects feet was normal. We found that the experimental group women who felt medium feet pain before kinesio taping, the pain diminished after therapy for 15% (p < 0.05).

**Conclusion.** The kinesio taping have no impact on changes of degree of flat foot deformations. Assessment of foot mobility, by using the navicular drop test showed that in both groups, more than half of the subjects were with foot hyperpronation, and after applied kinesio taping the result not changed. The positive effect of the kinesio taping method was proved on reducing foot pain in the experimental group compared with the control group (p < 0.05).
SHOULDER MOTOR FUNCTION RECOVERY USING DIFFERENT METHODS OF OCCUPATIONAL THERAPY

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Keywords. Shoulder motor function, Occupational therapy.

Introduction. More than 1.7 billion people, nearly 25% of the world’s population, are affected by a musculoskeletal condition. Shoulder pain has been suggested to affect between 7% and 34% of the adult population and is often the primary symptom of patients with shoulder musculoskeletal disorders. Until now, limited data exist about the content of Occupational therapy (OT) methods for recovery of shoulder motor function.

Aim. To evaluate the effect of OT methods by improving the hand motor function for patients with shoulder injuries.

Materials and methods. Totally, in clinical experimental research participated 30 patients with shoulder injuries (rotator cuff tear, shoulder impingement syndrome and proximal humeral fractures) were treated in out-patient rehabilitation unit. First group (experimental, n = 15) participants received a 10-day intervention consisting of a shoulder exercise program, concrete exercise with functional movement and physical activities exercise complex. Second group (control, n = 15) during 10-day intervention participated in OT program consisting of Theraband strengthening and hand cycling exercise. All outcomes were measured preintervention and postintervention at 10 days. Outcome measures were functional level of the hand determined through the Disabilities of the Arm, Shoulder and Hand questionnaire (DASH), pain intensity (Visual Analog Scale, VAS), range of motion (goniometry), muscular strength (Lovett scale) and hand gripping force (dynamometry).

Results. Hand motor function recovery results (DASH scores, range of motion and hand gripping force) in experimental group was found statistically higher than in control group (P < 0.05). Statistically significant differences between groups were not found in changes of hand muscle strength and pain intensity (P < 0.05).

Conclusion. In patients with rotator cuff tear, shoulder impingement syndrome and proximal humeral fractures, OT interventions with functional movement exercise complex is effective method to decrease the pain, improve hand functional level, gripping force, muscle strength and range of motion.
MEMORY DEVELOPING WITH TODAY`S TECHNOLOGIES FOR CHILDREN WITH CEREBRAL PALSY

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Keywords. RehaCom therapy system, occupational therapy, memory restrictions, cerebral palsy

Introduction. The development of memory in children with Cerebral palsy (CP) is one of the most important clinical-practical fields for occupational therapists (OT). In our days exists many ways how to develop memory but can new technologies cut out all of them?

Aim. To assess the effectiveness of “RehaCom” therapy system during OT session for improvement of memory in children with CP.

Materials and methods. Totally, 30 children with CP (8–14 years old) participated in research during 2017–2018. Participants were divided in two groups: experimental group (n = 15) and control group (n = 15). First assessment of memory was performed at the end of inpatient rehabilitation in Department of Physical Medicine and Rehabilitation, Vilnius University Children’s Hospital. “Reha-Com” therapy system was used to improve children’s memory. The second assessment was performed after 5 training OT session. Experimental group were trained with “RehaCom” system: every session includes 2 different tasks: 1 task duration – 5 min. Control group – traditional OT methods were used for memory improvement.

Results. Both groups showed very low significant improvement in memory over 5 sessions, but results were significantly different (p < 0.05): experimental group more actively participated in training session and reached high results. Control group during traditional OT also reached good results, but children didn’t show much interest.

Conclusions. This study indicates that the “Reha-Com” therapy program has very low positive effect for improvement memory in children with CP. For more precise results need to do much more sessions and maybe change tasks durations.
IMPROVING COMMUNICATION SKILLS AT SCHOOL FOR A CHILD WITH MIXED DEVELOPMENTAL DISORDERS USING OCCUPATIONAL THERAPY AND ABA THERAPY TECHNIQUES: SINGLE CASE STUDY

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Keywords. Communication skills, mixed developmental disorder, ABA therapy, school, occupational therapy.

Introduction. Over the past decade, a number of children with a diagnosed mixed developmental disorder have increased significantly. This is not a disease, so it is impossible to cure it. However, children can be integrated into social life and taught to live in such a way that they are considered the full-fledged members of society. A child with a developmental disorder requires intensive and individual occupations. One of the suitable method for eliminating various disruptions is the ABA (applied behavior analysis) therapy.

Aim. The main purpose of this study is to evaluate the impact of occupational therapy and ABA therapy on improving communication skills at school for a child with mixed developmental disorders.

Materials and methods. The research was done on a first-class, 7 year old student in Klaipėda who has a mixed developmental disorder. The boy’s behavior at school was observed for one school year from 2016 September 1st to 2017 June 23rd. At school the boy was taught to communicate with classmates according to occupational therapy and ABA therapy methods all the time, while he was at school.

Results. On the first few days of school, the child looked a little withdrawn and not talkative. When all children shared their impressions—he did not listen, but looked around the classroom and turned away from the children. The child did not raise his hand or talked to anyone. Combining the occupational therapy and ABA therapy helped the boy to learn communication skills and he started talking with his classmates and teacher. One month later, his communication with the classmates became smoother, he started raising his hand and answering the questions asked by the teacher. After 2 months, the boy started communicating with the classmates and teachers without encouragement. On the end of school year the boy was communicating with his classmates freely, however he still made spelling mistakes and had flight of ideas. The results of the research show that being close to the child, teaching him how to communicate politely and helping him to correctly formulate a question or a statement, makes him feel braver and more confident. This also helps him to start communicating with classmates and teachers faster, without encouragement and independently.

Conclusion. Study reveals that combining occupational therapy and ABA therapy can help children to learn how to communicate with people and pay attention to those who are talking. However, in order to reach the maximum, it is necessary to continuously work with the child, because that one year is not enough for the child to learn how to communicate freely and without mistakes.
FACTORS ASSOCIATED WITH THE USAGE OF HARM REDUCTION SERVICES AMONG PROBLEM DRUG USERS IN LATVIA, 2016

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Keywords. HIV prevention points, health, drug users

Introduction. There are twenty HIV prevention points (HPP) located in Latvia, where visitors can receive harm reduction services free of charge, such as express HIV and HIV related infection tests, needle exchange, condoms etc. Analysis of HPP visits among drug users will help to understand the needs of this target group.

Aim. To analyse differences in proportion of HPP visitors among drug users according to status of infectious diseases, needle sharing, self-rated health status, wish to quit on drugs and used substances in 2016 in Latvia.

Materials and methods. Data from problem drug users (PDU) cohort study in 2016 was analysed. Research was held by the Centre for Disease Prevention and Control of Latvia (CDPC) and non-governmental organisation ”DIA+LOGS” in several cities in Latvia. In 2016 there 546 participants were recruited. Statistical data processing was performed using MS Excel 2016 and IBM SPSS 22.0 software included Chi square tests.

Results. Stationary HPP are one of the most popular harm reduction services among drug users, in 2016 95.4 % respondents admitted visiting such sites at least once in their life. Higher percentage of HPP visitors is observed among methamphetamine users (98.8 %, n = 82/83, p = 0.153) than non-users, but results are not statistically significant and barbiturate users (2016, 98.2 %, n = 160/163, p = 0.045), than non-users – statistically significant. Among PDU who often think of quitting drugs higher percentage of HPP visitors is observed (97.1 %, n = 166/171) than among those, who do not thinking to stop on drugs (90.6 %, n = 29/32), but data is not statistically significant (p = 0.403). Percentage of HPP visitors higher among those, who have used shared syringes in a lifetime (96.1%, n = 399/415) than those who have not (93.1 %, n = 121/130), but results are not statistically significant (p = 0.145). The higher percentage of visitors was among respondents, who perceived their health as excellent (100 %, n = 2/2) and very well (100 %, n = 24/24), than those who rated their health as normal (93.8 %, n = 197 / 210), but results are not statistically significant (p = 0.485). Among PDU, who are HCV positives (97.1 %, n = 372/383) was the higher percentage of HPP visitors than those who were HCV negatives (94.5 %, n = 120/127), results are statistically significant (p < 0.001). Similar results are for HBV positives, but results are not statistically significant. (p = 0.142). Among PDU, who are HIV positives is a little bit higher percentage of HPP visitors (97.0 %, n = 97/100), than those who are HIV negatives (96.6 %, n = 371/384), results are statistically significant (p = 0.001).

Conclusion. Higher percentage of PDU with HIV and HIV related infection visit HPP, than those who are not infected. Higher percentage of PDU, who rated their health better visit HPP, than those, who rated it as normal.
THE LEVEL OF KNOWLEDGE ON THE USE OF ANTIBIOTICS AMONG THE GENERAL POPULATION IN LATVIA

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Keywords. Antibiotic usage, antibiotic resistance, antibiotic prescription.

Introduction. Antibiotic resistance has become a major issue in healthcare worldwide due to growth of antibiotic availability and usage, especially unreasonable antibiotic prescription and incorrect usage. As a result of rapidly growing epidemics of antibiotic resistance, the infections caused by bacteria are more difficult to treat, leading to rising costs of treatment, prolonged stay in healthcare facilities and increased mortality. One of action points to tackle these growing epidemics worldwide is to improve public’s awareness and knowledge about rational use of antibiotics.

Aim. To examine the level of knowledge of antibiotic usage and awareness of resistance among the general population in Latvia.

Materials and methods. A quantitative, cross-sectional study based on anonymous survey consisting of 36 questions about the general information of respondents, the availability of antibiotics, knowledge of antibiotic usage, application, side-effects, resistance and as well as thoughts about the doctors’ antibiotic prescribing habits was distributed via social networks and by personally meeting respondents of older age who do not have access to the internet. The target group of this survey were inhabitants of Latvia above the age of 18. IBM SPSS v.22 was used for statistical analysis of data.

Results. From 689 respondents who filled the survey, 649 (94.2 %) have used antibiotics in their lifetime. 240 (37 %) of respondents admit they have used antibiotics without the doctors’ prescription. 226 (34.8 %) of respondents believe antibiotics are useful for influenza treatment and 99 (15.3 %) think that common colds are cured more quickly with antibiotics. 188 (29 %) of respondents believe that antibiotics are effective against viruses. 438 (67.5 %) of respondents do recognize resistance as a significant problem both in the world and Latvia. 420 (64.7 %) of respondents believe doctors prescribe antibiotics unreasonably.

Conclusion. Younger respondents show slightly higher level of knowledge of antibiotic usage and resistance than older respondents do. Strikingly high rate of respondents do not follow doctors’ instructions on how to use antibiotics and use them without prescription. At the same time, low level of trust is shown in doctors’ decision to prescribe antibiotics and respondents believe that antibiotics are over-prescribed by doctors. Data shows respondents’ lack of knowledge regarding whether antibiotics are effective against bacteria or viruses. Research shows that further educational campaigns regarding antibiotic usage and resistance should be developed for the general population.
THE CHOICE OF ANTIDIABETIC DRUGS AND CORRELATION WITH HBA1C IN FAMILY MEDICINE PRACTICES

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Keywords. Diabetes, antidiabetic drugs, glycated hemoglobin.

Introduction. Diabetes mellitus is a common disease in the world and the number of diabetes patients is rapidly increasing. People who have diabetes need to measure glycated hemoglobin (HbA1c) test regularly to see if their levels are staying within range and it can tell if patients need to adjust their diabetes medications. According to American Diabetes Association recommendations for nonpregnant adults with diabetes the HbA1c target is < 7.0 %.

Aim. The aim of study was to determine how many of diabetes patients in a period of one year HbA1c have been measured and analyze diabetes patients HbA1c correlation against received antidiabetic medications and their combinations.

Materials and methods. Retrospective quantitative study in practices of two family medicine doctors was conducted in period between January 2017 and December 2017. During the study information from outpatient, cards were collected such as age, gender, type of diabetes, HbA1c and received antidiabetic medications. For statistical analysis, IBM SPSS Statistics 20.0 was used.

Results. During study, 127 diabetes patients were included. 101 (79.5 %) of diabetes patients in a period of one year HbA1c have been measured. Among 101 patients, 51 (50.5 %) were men and 50 (49.5 %) were women. Type 2 diabetes have 97 (96 %) patients with the mean age 62.5 ± 13.3 years and type 1 diabetes have 4 (4.0 %) patients with the mean age 28 ± 10.4 years. All patients mean HbA1c was 7.01 ± 1.4 %, type 2 diabetes patients HbA1c was 6.9 ± 3 % and type 1 diabetes patients HbA1c was 10.1 ± 2.2 %. In total, more often in diabetes pharmacotherapy was used monotherapy 53 (52.5 %)times with mean HbA1c 6.9 ±1.4 %, dual therapy was used 28 (27.7 %) times with mean HbA1c 6.8 ±1.4 %, triple therapy 14 (13.9 %) with mean HbA1c 7.6 ± 1.4 % and 4 medications combinations 6 (5.9 %) times with mean HbA1c 7.7 ± 1.2 %. Most often of all medications were prescribed monotherapy with metformin 42 (41.5 %) times where mean HbA1c was 6.4 ± 0.7 %. Diabetes patients who received insulin in therapy were 9 (8.9 %) with mean HbA1c 8.91 ± 2.2 % and all of these patients used it in monotherapy, 4 patients from 9 have type 1 diabetes.

Conclusion. Most of all diabetes patients (79.5 %) in a period of one year HbA1 have been measured. Patients who have type 1 diabetes is younger (28 ± 10.4 years) than patients who have type 2 diabetes (62.5 ± 13.3 years). Diabetes type 1 patients have higher HbA1c (10.1 ± 2.2 %) than type 2 diabetes (6.9 ±1.3 %). Most often, the doctors were prescribed the monotherapy with metformin and in this group was the lowest HbA1c 6.4 ± 0, 7 %. From all medications, highest HbA1c were patients who received 4 medications with mean HbA1c 7.7 ± 1.2 %.
INFANT IMMUNIZATION RATE IN GENERAL PRACTITIONERS’ PRACTICES. PARENTERAL UNDERSTANDING AND ENGAGEMENT

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Keywords. Vaccination, immunization rate, parenteral understanding.

Introduction. There is a tendency that in Latvia some parents refuse to vaccinate infants, and immunization rate is lower than World Health Organisation (WHO) recommend.

Aim. To study from general practitioners’ practices collected information about infants’ immunization rate and estimate parenteral understanding about vaccination, as well as parenteral engagement.

Material and methods. Altogether were studied 116 infants’ case-records in general practitioners’ practices in Riga and 69 infants’ case record in general practitioners’ practices outside Riga. There were studied infants which were born in year 2016. All infants’ parents were asked to fill in questionnaire about understanding of vaccination advantages and why parents agree or refuse to vaccinate infants’. Descriptive statistical analysis was performed using IBM SPSS v.22 software and Microsoft Excel 2016.

Results. There is no statistical significant difference between Riga general practitioners’ and outside Riga general practitioners’ practices (p = 0.26). In Riga general practitioners’ practices are 109 vaccinated infants (93.97%) and 7 (6.03%) cases, when parents refused to vaccinate infants. In general practitioners’ practices outside Riga are vaccinated 61 infants (88.41%). In general practices outside Riga 8 (11.59%) infants are not vaccinated, from them 5 (7.25%) denied all vaccines, 2 (2.90%) denied Rota virus vaccine after first dose and 1 (1.45%) denied Pneumococcus vaccine.

Conclusion.
1. In both Riga and outside Riga general practitioners’ practices immunization rate does not reach WHO recommended rate.
2. There is no significant difference between Riga and outside Riga general practitioners’ practices.
3. Further research is needed to investigate parenteral understanding about vaccination.
EXCESSIVE USE OF NON-PRESCRIPTION PAINKILLERS – THREAT OF THE SOCIETY?

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Keywords. Painkillers, non-prescription, medication use.

Introduction. Painkillers are commonly kept in the first-aid kits at home but rarely followed by manufacturer’s instructions during use. It is the easiest and quickest way to relieve the pain, especially to treat the headaches. Unfortunately, these pains could report also something else, more serious and lead to health problems.

Aim. To compare the opinions of pharmacies’ clients and pharmacists about tendencies in the use of non-prescription painkillers.

Materials and methods. During the period from September 2017 to January 2018 a prospective quantitative study was done. Questionnaire was designed to assess habits and tendencies of using non-prescription non-narcotic analgesics and sent electronically as well as given personally to the pharmacists and pharmacies’ clients. Data was analyzed using SPSS.

Results. The study included 173 pharmacists and 200 pharmacies’ clients, most of whom (87.1%) were women. 51.76% of pharmacies’ clients were used non-prescription painkillers to treat acute headache while pharmacists indicated the same reason approximately two times less (27.7% cases). In the period of last three months clients had used painkillers even six times. Despite the opinion of pharmacists that clients in 62.1% cases were looking for help from health care professionals, clients admitted that only in 24.2% of cases they asked for advice about treating the pain. Prescription and non-prescription painkillers were used concomitantly by 9.1% of the clients to intensify the effect of the medication. Pharmacists had noticed such tendency in clients more often – in 24.2% cases. 85.4% of the pharmacists noticed that society had not been enough informed of the reasonable use of medications. This fact approved by answers of clients where in 24.2% cases they more often or never followed the manufacturer’s instructions about correct use of medicines, for example, regardless of meals (64.3%), with coffee (25.7%) or without liquid (1.3%). Approximately 10% of the study population had complaints about burning sensation or pain in the stomach that could be indirect sign of consumption of analgesics.

Conclusion. Nearly half of the pharmacies’ clients used painkillers for acute headache without consulting with a doctor or a pharmacist. Painkillers could be used two times less in cases when the cause of the pain was found out (high blood pressure, blood clots, infection). Despite of complaints of the side effects people did not follow the manufacturer’s instructions and used the medicine incorrectly.
KNOWLEDGE AND ATTITUDE TOWARDS TOBACCO SMOKING RELATED HEALTH RISKS IN CURRENT SMOKERS AND PEOPLE WHO HAVE QUIT SMOKING

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Keywords. Public health, smoking, health risk, knowledge.

Introduction. Tobacco smoke contains an estimated 5000 chemicals and affects almost every organ of the human body. According to World Health Organization, about 5.4 million premature deaths per year worldwide are due to tobacco smoking and main causes of death are cardiovascular diseases, chronic obstructive pulmonary disease and various types of cancer. [Talhout et al., 2011]

Aim. To evaluate and compare the knowledge of and attitude towards tobacco-smoking related health risks in general population between current smokers and previous smokers.

Materials and methods. A questionnaire was created using Google Forms and distributed by social media. A total of 144 responses were collected and analyzed using IBM SPSS Statistics 23 (Mann-Whitney U, Chi-square, Fisher’s exact test, p < 0.05 was considered as statistically significant).

Results. In this study 81 people smoked regularly (group R) and 63 had quit smoking (group Q). Respondents had gained information from similar sources, but in group R more often general practitioner was marked as an information source (25.9 % vs. 12.7 %, p = 0.05). In general, the knowledge about tobacco smoking related health problems did not differ between groups with an average of 7.3 (SD = 2.57) in group R and 7.7 (SD = 2.51) out of 11 in group Q (p = 0.531), but knowledge about increased risk of abortion, extrauterine pregnancy (58.7 % vs. 42 %, p = 0.046) and osteoporosis (34.9 % vs. 14.8 %, p = 0.005) due to smoking was better in group Q. Group Q tended to identify the tumour localizations related to smoking better than group R, including for lungs (100 % vs. 87.7 %, p = 0.003), intestines (22.2 % vs. 8.6 %, p = 0.022), liver and pancreas (27.0 % vs. 12.3 %, p = 0.026), kidneys (19.0 % vs. 7.4 %, p = 0.036) and breasts (17.5 % vs. 6.2 %, p = 0.033). In group R more people had thought about their risk for smoking related health problems (92.6 % vs. 81 %, p = 0.036), and more people thought their risk to be increased in group R (67.9 % vs. 46.0 %, p = 0.008). The concerns about smoking related problems were similar in both groups, but people in group Q were more concerned about smoking induced changes in their appearance than in group R (61.9 % vs. 44.4 %, p = 0.037).

Conclusion. According to the results of this study, people who had quit smoking had similar knowledge of smoking related problems but had better knowledge about various smoking related tumour localizations. Taking these results into account, it seems that having better knowledge about tobacco smoking related health risks might help people to decide to quit smoking.
SMOKING IN LATVIAN WOMEN BEFORE AND DURING PREGNANCY

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Keywords. Smoking, pregnancy.

Introduction. Maternal cigarette smoking during pregnancy remains a significant public health concern associated with many adverse prenatal and foetal risks. According to the report of Health Behaviour among Latvian Adult Population, 2016, 33 % of the adult population aged 15 years and over are estimated to be current tobacco smokers, including 22.9 % of women in childbearing age. Prenatal exposure to maternal cigarette smoking is considered to be amongst the most harmful modifiable risk factors and is associated with preterm delivery, spontaneous abortion, growth restriction, increased risk of sudden infant death syndrome, as well as many behavioural and psychiatric disorders.

Aim. To investigate the prevalence of smoking before and during pregnancy in Latvia.

Materials and methods. This study was conducted by Rīga Stradiņš University in cooperation with the Centre for Disease Prevention and Control and the World Health Organisation branch in Latvia. A cross-sectional survey took place in maternity outpatient clinics and maternity departments in Latvia during six month period in 2017. Questionnaire included smoking habits before pregnancy and changes during pregnancy. Statistical data was processed in IBM SPSS statistics.

Results. 393 women were included in this study. Mean age was 29 years (SD 5). The results show that 28.5 % (n = 112) of women declare they smoked before pregnancy. 80.4 % (n = 90) of them had stopped smoking more than a year before conceiving, 9.8 % (n = 11) had stopped less than a year before conceiving and nine, 8 % (n = 11) continued to smoke.

The average number of cigarettes smoked daily was 8.5 (SD 5). 27 % (n = 30) of women were very concerned, 23 % (n = 26) were quite concerned, 17 % (n = 19) were not too concerned, and 33 % (n = 37) were not concerned about smoking associated risks on foetal health. Only 32 % (n = 36) women received recommendations for smoking cessation. 25 % of recommendations women received from family members, 24 % from gynaecologist, 17 % from other people, 11 % from general practitioner, 6 % from midwife, 4 % from dentist, 4 % from nurse, 2 % from nutritionist and 7 % from other healthcare providers.

Conclusion. Smoking is considered as a major problem in a pregnant women nowadays. Pregnancy and the postpartum period provide opportunities to promote smoking cessation and smoke free families. Pregnant women should be advised by health-care providers to stop smoking in order to reduce the overall risk of complications as well as any risk of adverse impact on the unborn child.


ALCOHOL CONSUMPTION IN LATVIAN WOMEN BEFORE AND DURING PREGNANCY

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Keywords. Alcohol, pregnancy.

Introduction. In Latvia, alcohol use is a common habit among women. According to the report of Health Behaviour among Latvian Adult Population, 2016, during the last year 72.8 % of women were using alcoholic beverages. The main proportion of women users were 25–54 years old. Alcohol consumption during pregnancy can lead to adverse foetal outcomes, such as foetal alcohol syndrome (FAS). The main issue is that there is no safe amount of alcohol during pregnancy, therefore it is advised not to use any alcohol while pregnant. In 2013, The Centre for Disease Prevention and Control in Latvia indicated 17.3 % women who used alcohol at least once during pregnancy.

Aim. To investigate alcohol consumption pattern before and during pregnancy.

Materials and methods. This study was conducted by Rīga Stradiņš University in cooperation with the Centre for Disease Prevention and Control and the World Health Organisation branch in Latvia. A cross-sectional survey took place in maternity outpatient clinics and maternity departments in Latvia during six month period in 2017. Questionnaire included alcohol consumption habits before pregnancy and changes during pregnancy. Statistical data was processed in IBM SPSS statistics.

Results. 393 women aged 15–45 years were included this study. 42.2 %, (n = 139) pregnant, 57.8 %, (n = 227) postpartum. 73.5 % (n = 289) of women reported consuming some alcohol before pregnancy. 68 % (n = 268) of women answered that they did not use alcohol during pregnancy. 18.6 % (n = 73) stopped usage of alcohol after pregnancy was first encountered. 13.2 % (n = 52) of women consumed alcohol during pregnancy. The average amount of alcohol weekly consumed before pregnancy was 2.6 units. The highest alcohol consumption rates before pregnancy were associated with parity (80.6 %, p = 0.016), but not with maternal age, marriage status, educational attainment or material status. The amount of alcohol consumed by pregnant woman did not exceed 1 alcohol unit per week.

Conclusion. The consumption of alcohol is a relevant issue amongst Latvian pregnant women. Health care providers and policy-makers have to raise awareness on consequences of alcohol usage, and appropriate recommendations should be given to women.
THE RISK OF OVERWEIGHT AND OBESITY IN PRE-SCHOOL CHILDREN

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Keywords. Children, overweight, obesity, BMI.

Introduction. Childhood obesity is one of the most serious health challenges of the 21st century. According to WHO (World Health Organization) data in 2016, about 41 million children under age 5 and over 340 million children aged 5–18 were overweight or obese. By the data, 18% of girls and 19% of boys are overweight. Overweight and obesity of children and young people are major risk factors for chronic diseases and are associated with an increased risk of obesity and premature mortality in adult age.

Aim. The aim was to study risk of overweight and obesity for pre-school children in various ages using body mass index analyze.

Materials and methods. Retrospective study included data from family doctor’s practices of children at age of 7. Using measurements of height and weight at ages, one, three, five and seven, BMI for each child was calculated. Body mass index (BMI) formula: BMI = mass (kg)/ height (m)^2 (kg/m^2). Risk of children with overweight (> 1 SD) and obesity (> 2 SD) was obtained by analyzing BMI with Standard deviation (SD) using Z-score data. Data was analyzed in Microsoft Office Excel 2016 and IBM SPSS Statistic Subscription programs.

Results. Study included 100 children – 40 girls and 60 boys. According to data, average BMI for 1-year-old children is 16.8 (± 1.6), average SD is −1.1 (± 1.5), it includes 10.0% with overweight (girls – 2.5%, boys – 20.0%) and 1.0% with obesity (girls – 2.5%). In age 3 average BMI is 15.9 (± 1.2), average SD – 0.2 (± 0.9). In this group 16.0% of children are overweight (boys – 15.0%, girls – 17.5%) and 2.0% with obesity (boys – 1.7%, girls – 2.5%). In ages 5 and 7, the average BMI respectively is 15.5 (± 1.5) and 16.05 (± 2.1), average SD is −0.4 (± 1.0) and 0.1 (± 1.2). 9.0% of children in age 5 are overweight (boys – 8.3%, girls – 10.0%) and 5.0% with obesity (boys – 5.0%, girls – 5.0%). 11.0% of children in age 7 are overweight (boys – 11.7%, girls – 10.0%) and 9.0% with obesity (boys – 6.7%, girls – 12.5%). From all children with obesity in age 7, 11.0% of them obesity was diagnosed for the first time in age 1. Further, 11.0% in age 3, 22.0% in age 5 and 56.0% in age 7.

Conclusion. Children obesity risk increases over ages, from 1% at age one to 9% at age 7. The highest risk to be diagnosed with obesity is in age group 6 to 7 (+ 4%) and the lowest risk in age group 2 to 3 (+ 1.0%). Children with obesity in age 7, already had obesity (44.4%) and were overweight (22.0%) before age 5. The obesity risk increases in ages, but it can be predicted before by using weight and height measurements. Further data analyzed by SD method is recommended in every family doctor’s practice to decrease complications of obesity in adult age.
EXCESS WEIGHT AND DIETARY HABITS IN PREGNANT WOMEN IN LATVIA

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Keywords. Dietary habits, pregnancy, excess weight

Introduction. Nowadays overweight is a common problem which during pregnancy can cause a potential health risk for both mother and foetus. Moreover, in Latvia number of overweight women is increasing.

Aim. The aim of the study was to evaluate women's weight before pregnancy and eating habits during pregnancy.

Materials and methods. This study was done by Rīga Stradiņš university in cooperation with The Centre for Disease Prevention and Control and World Health Organisation branch in Latvia. This cross-section survey of pregnant women took place in Latvia's maternity outpatient clinics and maternity hospital departments during six-month period in 2017. We excluded women with diabetes, coeliac disease, short bowel syndrome, Chron's disease, ulcerative colitis and eating disorders. Using original study protocol data analysis was done using statistics program SPSS ver.23.

Results. We interviewed 393 women in maternity outpatient clinics (34.6 %, n = 136) and maternity hospital departments (65.3 %, n = 257). Mean age was 28.8 +/- 5.1 years. Before pregnancy 67.7 % had a normal body mass index (BMI, kg/m²), 19.2 % were overweight, 8.5 % were obese and 4.7 % underweight. 46.8 % women evaluated their physique as an average, 27.5 % as almost good and 13.0 % as very good. 63.6 % evaluated their overall health as good and only 1.0 % as bad. 60.8 % women have changed their eating habits during pregnancy, mostly those who were overweight before pregnancy (71.2 %). 53.4 % did not try eating healthier during pregnancy and only 29 %, who were underweight before pregnancy, ate healthier. 65.3 % women who were overweight before pregnancy did not eat more unhealthy during pregnancy. 48.3 % women had the same portion size as before pregnancy, 35.6 % women had slightly enlarged (~10 %) portion size and 14.2 % women had enlarged portion size for at least 30 %. 29 % of women who were underweight before pregnancy increased their portion size for at least 30 %. There was no statistical significance between weight before pregnancy and dietary habit change during pregnancy.

Only 7.1 % women consumed one portion (200ml) of vegetables fourteen times per week, 24.9 % seven times per week and 8.7 % only two times per week. 26.5 % women consumed one portion of fruits (one item) seven times a week, 23.2 % four times per week and 12.7 % only three times per week.

Conclusions. Excess weight is a common problem in Latvia among women before pregnancy. Most women had changed their eating habits during pregnancy however did not eat more healthy. Most women during pregnancy do not consume enough vegetables and fruit. Women should be better informed about health habits during pregnancy.
EVALUATION OF BARIATRIC SURGERY PATIENT’S WEIGHT REDUCING EXPERIENCE

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Keywords. Obesity, bariatric surgery, metabolic surgery, obesity treatment, weight loss.

Introduction. The modern industrialization brings along not only a string of benefits but also a variety of health problems, obesity being one of them. There are three key approaches to treating obesity: lifestyle change, use of weight loss medications and also weight loss surgery. It is recommended to lose 5% -10% of excess weight prior to surgery. Physical activity plays a critical role in improving health for obese individuals.

Aim. The aim of current study was to evaluate the lifestyle habits and weight loss experience of obese patients prior to bariatric surgery.

Materials and methods. This is a one year quantitative cross-sectional study that was carried out from November 01, 2016 to October 31, 2017. The subjects of the study were patients who had applied for a bariatric surgery in one of the four clinics in Latvia that were included in the research. Patient participation in survey was voluntary and random.

Results. There were 72 individuals (63 female and 9 male; aged 30–49). Maximum lifetime weight range was 132–96 kg, but average all patient BMI prior to surgery was 37.6 kg/m². Only 14 patients (19.2 %) of this study succeeded to reduce weight prior to the bariatric surgery. Six months prior to the bariatric surgery 20 subjects (27.4 %) weight was relatively stable, but weight of the rest of the patients (53.3 %) has increased. 98 % of all patients have tried different weight loss methods. Most popular methods were: self-directed diet (72.5 %), commercial programs (52.9 %), over-the-counter and herbal remedies (48.6 %) and personal trainer or ready-made exercise programs (47.1 %). There is a link between patient’s age and food consumption – subjects under 37 years of age regularly overeat (61.3 %), but those who are older than 37 years are more likely to have regular meals (72.2 %). There is overall lack of physical activity – only 30.1 % of patients are active at least 40 minutes a day. More than 70% of patients spend at least 4 hours per day in sitting position, and they are most likely to have irregular meals. 54.8 % of patients are eating regular breakfast. Irregular meals during week had negative weak correlation with rate of breakfast, dinner and supper, r = −0.280, p = 0.017, r = −0.261, p = 0.027, r = −0.261, p = 0.027, respectively. Patients who had addition meals had a positive correlation with abnormal eating – in the morning r = 0.339, p = 0.004, in the midday r = 0.251, p = 0.036, in the evening r = 0.237, p = 0.049. Most of the study subjects became obese in childhood (23.3 %) or adolescence (37 %), their maximum life weight was higher if obesity started at an earlier age.

Conclusions. The results of the research highlight that all patients had unsuccessfully tried to reduce weight by other methods before making the decision to undergo a bariatric surgery. The reason for poor preparation was irregular meals, breakfast avoidance, low physical activity and patient’s age is under 37 years. Additional research and data are needed to understand whether regular breakfast, lunch and dinner, adequate physical activity, combined with other additional methods together would give better results for preparation before a bariatric surgery.
THE ROLE OF FAMILY PHYSICIAN IN CONTRACEPTIVE UNDERSTANDING AMONG LATVIAN ADOLESCENTS

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Keywords. Primary health, contraception, adolescents.

Introduction. The research “Reproductive Health of the Population in Latvia” (2003–2011) has shown that adolescents of both genders aged 15–19, in general, do not regard healthcare specialists as potential advisors for reproductive health. However, many young people engage in high sexual risk behavior that can result in teen pregnancy and sexually transmitted diseases (STDs). Generally, it is recognized Family physicians (FP) are accessible and reliable sources of information about contraception and STDs.

Aim. To investigate Latvian adolescents knowledge of contraception and their attitude towards the FP as a source of information about reproductive health.

Materials and methods. The study group included 163 respondents (R) aged from 15 to 19 (mean 17), 83 R were from Rezekne State Gymnasium No.1., 80 R were from Riga State German Grammar School. An originally created questionnaire was used to collect data from respondents. Analyzing was done using IBM SPSS, 23.0.

Results. A total of 91 females and 72 males participated in the study. The most commonly preferred contraception method among females was male condom in 79.1 %, hormonal pills in 14.3 %, among males’ condom in 79.2 % and coitus interruptus in 9.7 %.

When asked about the source with regards to contraception, 72.5 % of females would search on the internet, 13.2 % would ask a gynecologist, 80.6 % of males would search on the internet, 5.6 % would ask FP. 68.1 % (n = 62) of females know that hormonal contraception does not prevent STDs and only 44.4 % (n = 32) of males know it (p = 0.005). 73.6 % (n = 67) of females know that emergency contraception does not prevent STDs and 51.4 % (n = 37) of males know it. (p = 0.04). Coitus interruptus (67.0 %), calendar method (24.2 %) and spermicide (4.4 %) was admitted as the most ineffective contraceptive method among females, and coitus interruptus (47.2 %), calendar method (26.4 %) and hormonal contraception (13.9 %) among males (p = 0.02). On the question “If the family physician ever informed you about contraception?”, only 11.0 % of females and 9.7 % of males answered affirmatory. 30.8 % of females and 27.8 % of males would feel self-conscious talking about contraception with FP. 74.8 % of respondents think that FP should educate adolescents about STDs, and 66.9 % that FP should educate adolescents about contraception methods.

Conclusion. The research showed that male adolescents had less knowledge about hormonal contraception. A negligible part of adolescents had consulted about contraception by FP. The third part of respondents felt self-conscious talking about contraception with FP. The study opens up a discussion if FP should take more initiative in sexual education, especially in the education of male adolescents.
SEXUAL ACTIVITY OF HEARING IMPAIRED
LATVIAN STUDENTS

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Keywords. Hearing impaired, sexual activity, students.

Introduction. Young people with disabilities are often seen as asexual by their families, care providers and society. Hearing impaired students have the same sexual health issues and they are as likely to be sexually active as nondisabled peers.

Aim. The aim of the study was to investigate the sexual experience of hearing impaired students and compare their sexual behavior to regular high school students.

Materials and methods. The study group included 57 students aged 17 to 19. The hearing impaired group (HI) consisted of 14 girls and 5 boys who studied at Riga's Raina 8th evening (shift) secondary school and control group (CG) consisted of 28 girls and 10 boys who studied at Rezekne State Gymnasium No.1. An originally created questionnaire was used to collect data from respondents about their sexual experience and behavior. In hearing impaired group, every question was explained by sign language interpreter. Analyzing was done using IBM SPSS, 23.0 version.

Results. 14 of 19 (73.7 %) HI students have had sexual intercourse while in the CG 55.3 % (21 of 38) confessed to having a sexual relationship (p = 0.25). 36.8 % (n = 7) of HI admitted not understanding, what “oral”, “vaginal” and “anal” sexual intercourse means. 6 of 19 HI have had one-night stands and 3 support having one-night stands. In comparison 7 of 38 HI have had one night stands and 8 of them support such kind of behaving (p = 0.32, p = 0.68).

50 % of the HI and half of the CG admitted having sex in the inebriated state (p = 0.1). 15.8 % HI and 7.9 % in CG confessed having forced sexual relationship (p = 0.65). As most common sources of information about sexual relationship in the HI group were named parents 47.4 % n = 9, then internet 42.1 % (n = 8) and friends 36.8 % (n = 7). CG admitted that school was the main source of information 60.5 % (n = 23), internet 55.3 % (n = 21) and friends 44.7 % (n = 17).

Conclusion. Studies showed no significant differences in compared groups, hearing impaired students were as sexually active as their nondisabled peers. However, research also showed that hearing impaired have less knowledge about a sexual relationship. Consequently, there should be implemented comprehensive and medically accurate sexual education in school programs for hearing impaired students.
CONTRACEPTIVE UNDERSTANDING AMONG LATVIAN STUDENTS WHO ARE HEARING IMPAIRED

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**Keywords.** Hearing impaired, contraception, students.

**Introduction.** It is found that hearing impaired (HI) students have poor knowledge about human sexuality and they are more likely to engage in unsafe sex. Most of them are not properly taught about sexual health, therefore they cannot understand how sexually transmitted diseases (STD) are passed and they do not understand the seriousness of STD.

**Aim.** To research hearing impaired Latvian student’s knowledge of contraception and sources of information. Compare their sexual behavior to regular high school students.

**Materials and methods.** The study group included 57 students aged 17 to 19. The HI group consisted of 14 girls and 5 boys who studied at Riga Raina 8th evening (shift) secondary school and control group (CG) consisted of 28 girls and 10 boys who studied at Rezekne State Gymnasium No. 1. An originally created questionnaire was used to collect data from respondents. In HI group every question was explained by sign language interpreter. Analyzing was done using IBM SPSS, 23.0.

**Results.** 14 of 19 (73.7%) HI students have had sexual intercourse while in the CG 55.3% (21 of 38) confessed to having a sexual relationship. Most commonly used contraception method of sexually active HI students was male condom (n = 5), coitus interruptus (n = 5), no contraception (n = 4). In comparison, CG students mainly chose male condom (n = 19), coitus interruptus by 1 person and calendar method also by 1 person. 8 of 14 sexually active HI students never use contraception during sexual intercourse. In CG only 2 of 21 people never use contraception during sex (p = 0.001). Hormonal contraception was admitted as the most effective contraceptive in 61.5% cases among HI, however, in CG 71.4% named male condom (p = 0.022). As the most ineffective contraceptives 46.2% of the HI named calendar method and male condom (p = 0.001). Just 42.1% (n = 8) of all HI youngsters and 92.1% of CG knew how HIV is transmitted (p = 0.001). 21.1% of HI students and 97.4% of CG students knew what STDs were (p = 0.001). As most common sources of information about contraception in the HI group were named parents 52.8%, then friends 42.1% and at last school 36.8%. As most common sources of information about STD in the HI were named parents 52.8%, then a doctor 36.8% and school 16.3%.

**Conclusion.** The study showed a significant difference in knowledge about contraceptive methods. Unfortunately, there is also a lack of understanding about STDs and a rare usage of any prevention. However, hearing impaired students were as sexually active as their nondisabled peers. As parents were the most common source of information, more attention should be paid to parental education, consequently, there should be better school involvement.
PHYSICAL ACTIVITY AMONG HEALTHY PREGNANT WOMEN IN LATVIA

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Keywords. Pregnancy, physical activity.

Introduction. There is scant knowledge about the overall physical activity (PA) among pregnant women in Latvia and also limited research that examines actual exercise behaviours during pregnancy worldwide. Recent research proves that many women reduce their activity levels during pregnancy and most are not sufficiently active.

Aim. To investigate PA among pregnant women and evaluate the association of daily PA with the number of children.

Methods. This study was done by Riga Stradiņš University and The Centre for Disease Prevention and Control in cooperation with World Health Organisation branch in Latvia. A cross-sectional prospective research of 393 pregnant women in Latvia was done in 2017. Original study questionnaire included evaluation of PA during pregnancy and received advises from medical professionals. Analysis was done using statistics program SPSS ver.23.

Results. All women were divided into three groups depending on number of children: group I (one child) – 45.8 % (N = 180), group II (2 children) – 31.8 % (N = 125), group III (≥ 3 children) – 22.4 % (N = 88). 46.8 % of all women evaluated their physical form as an average and only 13.0 % as very good. 71.3 % (N = 280) reported sedentary activities of ≥ 4 h daily. 51.1 % (N = 92) in group I, 57.6 % (N = 72) in group II and 68.2 % (N = 60) of respondents spent free time by doing mild PA. Women did moderate PA before pregnancy more often in group III – 38.6 % (N = 34) than in groups I and II (p = 0.07). Most active were pregnant women in group III – 20.5 % (N = 18), comparing with group I 10.6 % (N = 19) and group II – 7.2 % (N = 9) (p = 0.05). Only 15.5 % (N = 61) of respondents went to specialized exercise programs for pregnant women in average 22.7 weeks (SD = 8.8) of pregnancy, in gymnastics attended – 20.6 % (N = 37) of group I, 11.2 % (N = 14) of group II and only 11.4 % (n = 10) of group III women, so primaparous women more often visit special gymnastic lessons than multiparous women (p = 0.04). Only 47 respondents received suggestion from gynecologists to be more physically active, and 85.0 % (N = 153) in group I, 84.8 % (N = 106) in group II, 94.3 % (N = 83) in group III didn’t recieve any reccomendations about physical activity during pregnancy.

Conclusion. There is insufficient PA among pregnant women in Latvia. Multiparous women are more physycally active before and during pregnancy. It is important to educate pregnant women about numerous benefits of PA and to stimulate them to be more active.
SIMILARITIES AND DIFFERENCES OF ARTERIAL HYPERTENSION
PATIENT CARE IN LATVIAN AND NORWEGIAN
GENERAL PRACTITIONERS PRACTICES

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Keywords. Arterial hypertension, treatment, general practitioners.

Introduction. Arterial hypertension (AH) has become a major health issue worldwide. It is important to diagnose and treat AH, as it is a major risk factor for cardiovascular diseases like heart attacks and strokes. Annually, around 9.4 million people die worldwide due to hypertensive complications. For adults, the AH prevalence in 2014 was 18.1% in Norway, 27.9% in Latvia.

The primary care givers are closest to the patients, and from a healthcare perspective, both economically and medical, the role of the general practitioners (GPs) in diagnosing and treating AH should not be underestimated.

Aim. The aim of this scientific study is to investigate and examine the similarities and differences of AH patient care in two countries with different economy and different primary care system.

Materials and methods. This is a cross sectional quantitative study. After the literature review about AH and both primary care system was done, there was made an electronic questionnaire for GPs about AH patient follow-up and treatment. The questionnaire was sent out to GPs in both countries and 57 Norwegian, 64 Latvian volunteer GPs. Data was collected and analyzed using SPSS 22.0, and Microsoft Excel answered it. Lastly, the main similarities and differences were concluded.

Results. The responders from Norway had a mean age of 40.5 years (54.4% males). They had worked in average 9.4 years as a GP, and had 1174 patients’ average in their practice. The responders from Latvia on the other hand, had a mean age of 54 years (6.3% males). They had worked in average 19 years as a GP, and had an average of 1851 patients in their list. There is no significant difference (82.2% Latvia, 84.2% Norway) between the two countries regarding if they are using guidelines in the treatment of AH. When asked if they are having a routine for follow-up the results were statistically lower for Latvia than Norway (9.5% Latvia, 85.5% Norway). The results for Latvia was statistically higher than Norway when asked if they would do more tests during follow-up if they were not limited by economy (63.5% Latvia, 3.6% Norway). Regarding the regularity of control visits, the patients are coming every 2–4 months regardless of AH degree in Latvia, but in Norway it depends on degree, ranging from 2–12 months. In the first choice of therapy, the Latvian GPs answered non-pharmacological 3.1%, pharmacological 4.7% and mixed 92.2%, compared to 36.8%, 5.3% and 57.9% respectively.

Conclusion. There are many differences between Latvian and Norwegian GP practice organization, and doctors are working differently based on the healthcare system. In both countries, the GPs are using the same AH guidelines, but they apply it in a different way.
THE ROLE OF A GENERAL PRACTITIONER IN HEALTH PROMOTION AND DISEASE PREVENTION

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Keywords. Family medicine, health promotion, disease prevention.

Introduction. Nowadays more and more focus is put on health promotion and disease prevention measures to preserve human health and avoid diseases and/or development of their complications as far as possible, thus improving patients’ quality of life. Therefore, it is important to elicit general practitioners’ (GPs’) knowledge and opinion about their role in preservance of their patients’ health. In the recent years, there have been multiple quantitative researches in this field of healthcare in Latvia, containing information about screening rate, i.e., about only secondary disease prevention. Also, data about catching various diseases, including vaccine-dependent infection diseases, is regularly aggregated, but there is no research on prevention of these diseases, i.e., on primary disease prevention.

Aim. To assess general practitioners’ opinion and the amount of knowledge about health promotion and disease prevention and their role in the implementation of promoting and preventive measures.

Materials and methods. The research will be conducted in 4 phases:
1) Systematic literature analysis of types and need of health promotion and disease prevention and statistical data of disease prevention rate in Latvia;
2) Development of semi-structured interview questions based on issues highlighted in the literature analysis;
3) A recorded interview (face-to-face) with the selected 12 GPs using the semi-structured interview questions from phase 2;
4) Data analysis containing repetitive listening to the voice records of the interviews, after which data is transformed by coding and validation using qualitative data analysis software NVivo; drawing up conclusions.

Results. At this moment, only two thirds of interviews have been conducted, but already some tendencies can be observed. Preliminary results show that not everyone visits GP every year. Mostly they go to GP only in cases of acute illness or because they need medication to control some chronic disease, but just a small part wants to check their health. Most of GPs admitted the lack of time as one of the biggest problems for both sides – patient and doctor.

Conclusion. After first two phases of the research, some of conclusions can be made. The GP has the biggest role in health promotion and disease prevention. Everyone should visit GP free of charge once a year to control his or her health status. This research shows only opinion from few GPs, but wider research involving more GPs and patients is needed to obtain the real situation in Latvia.
THE REASONS WHY PARENTS FIRST TURN TO EMERGENCY DEPARTMENT AT CHILDREN’S CLINICAL UNIVERSITY HOSPITAL AND NOT THEIR FAMILY DOCTOR

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Keywords. Parents, children, general practitioner (GP), emergency department (ED).

Introduction. Every day ~200 parents with children seek help at the EDOU. Only about 20% of cases hospital treatment is necessary, otherwise, help of a GP could be enough. This causes overcrowding at the ER, where parents and their children are waiting for a consultation. The staff is busy and overworked; the focus is shifted from patients with higher priority needs. It puts children at risk of infections and causes frustration and anger with the healthcare system.

Aim. To clarify possible reasons why parents prefer to seek hospital help first.

Materials and methods. A prospective study was carried out in 2017 by a random survey of parents and their children (n = 300 patients), who received a lower priority (yellow, green, white) in the sorting process of EDOU, whose condition is more stable in comparison with higher priority (orange, red). Statistical analysis was performed using MS Excel.

Results. A total of 300 respondents (parents of children aged 0–17) were surveyed. 53% (157) of parents came to the hospital without any referral from a GP or ambulance.

The mean duration of illness at the hospital visit was 1.3 days (min 1; max 90). 41% (123) of the parents had not contacted their GP during this particular illness, and 64% (192) had not seen the GP prior to coming to the hospital.

The most common reasons for not going to the GP were: in 45% (85) - GP does not work in this hour/date; 46% (87) “other” reasons (GP is on a sick leave, GP is not a pediatrician etc.) in 13.8% (26) parents thought, they could handle this on their own.

The most common reasons for coming to the Emergency department were 45% (134) sudden deterioration; 35% (104) hospital provides more examinations, analysis and specialist consultations within a shorter time period; 19% (57) no improvement following GP recommendations.

On a scale of 1 to 10 (1 - the worst, 10 - the highest) parents rated their trust in GP as an average of 7.8 (mode 9, median 8, min 1, max 10), trust to the hospital as 8.7 (mode 9, median 9, min 1, max 10) and the communication with their GP as 8.3 (mode 10, median 9, min 1, max 10). 19% (57) of all patients were hospitalized, 81% (243) were classified as primary care patients and sent home.

Conclusion. The majority of interviewed parents (53%) prefer to seek the hospital help, based on the higher hospital trust level comparing to GP (despite their trust in GP of 8). The results underline the need of improvement in primary child health care system, including both parent and staff education and doctor-parent-patient communication.
BLOOD GLUCOSE SELF–MONITORING IN TYPE 2 DIABETIC PATIENTS UNDER THE SUPERVISION OF GENERAL PRACTITIONER

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Keywords. Diabetes mellitus type 2, glucose self-monitoring, glycated haemoglobin, diet.

Introduction. The global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014. It is estimated that diabetes mellitus type 2 accounts for about 90% to 95% of all cases of diabetes. Self–monitoring plays a big role in control of the disease and development of the diabetes complications. It is recommended to check the blood glucose 3 times a day for 2 days a week. Unfortunately, not all of the patients do it, some do it irregularly and some do not do it at all.

Aim. The aim of this study is to evaluate the effect of regular blood glucose (BG) self-monitoring and following the diet recommendations on the diabetes mellitus type 2 compensation by determining the level of glycated haemoglobin (HbA1c).

Materials and methods. The study includes patients (men and women aged 30–80 years) with diabetes mellitus type 2 diagnosis for more than a year and who are treated only with oral hypoglycemic agents. Patients with diabetes mellitus type 2 and insulin therapy are excluded from this study. Patients are interviewed face to face, and the last laboratory results for BG and HbA1c levels in 3 months time are clarified.

Results. Pilot study results show that BG self-monitoring does not have a monosomal effect on HbA1c levels. While in a group where patients follow recommended diet the levels of HbA1c are statistically lower than in those who do not follow the diet fully.

Conclusions. Pilot study has shown that following diet recommendations have a statistically significant effect on HbA1c levels, while the regularity of BG self-monitoring does not show a significant effect on HbA1c level. A more precise study is needed to evaluate the effect of BG self-monitoring on HbA1c level, since patients often do not undergo self-monitoring, either for objective or subjective reasons.
SYSTEMATIC ASSESSMENT OF THE SPORT CENTER CLIENTS’ LIFESTYLE

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Keywords. Healthy lifestyle, nutrition, physical activity.

Introduction. According to the WHO, human health mostly depends on the lifestyle. Determinants of health (BMI, smoking, alcohol consumption, stress, consumption of fruits and vegetables, physical activity) are among the European Core Health Indicators (ECHI), therefore widely used for comparison among countries in the preparation of strategies and policy, aimed at improving human health and monitoring implementation. Maintaining healthy lifestyle is extremely important for people aged from 35 to 44 years, because this part of the population is more vulnerable to surrounding environment, tend to gain weight easily due to the lack of physical activities, unhealthy diet and stress. In order to avoid adverse health effects, people should promote a healthy lifestyle which includes sports, healthy nutrition, rest and regimen.

Aim. This study was designed to assess the quality of lifestyle of the Sport Center’s clients.

Materials and methods. Standardized survey was created according to research data of Health Behavior among Lithuanian Adult population, made by Lithuanian University of Health Sciences every four years, and active lifestyle recommendations, prepared by British Nutrition Foundation. Obtained results were compared with FINBALT HEALTH MONITOR investigation. 52 clients aged from 35 to 44 years of sport center “GoodLife”, located in Vilnius, completed a questionnaire for information on lifestyle and nutritional status.

Data analysis was performed using the IBM SPSS Statistics 22.0 for Windows statistical software. p value was used to determine the significance of statistical hypotheses. After selecting 5% significance level \( a = 0.05 \) the correlation between the statements was considered statistically significant and reliable, when p value does not exceed 0.05 (\( p < 0.05 \)).

Results. The decline in physical activity, confusion in work/rest time, unhealthy nutrition of clients from 35 to 44 years are monitored. Every second respondent complains about the digestive system illness. Every third respondent does not eat properly. The majority of respondents feel the lack of knowledge about nutrition.

Conclusion. Lifestyle components are changing for people over the years and most often adversely affect human health in the older adult age.

Sport centers should take preventive measures and participate not only in making conditions for physical activity, but in teaching and advising their clients about healthy lifestyle, one of the main components is proper nutrition.
PERCUTANEUS ENDOSCOPIC GASTROSTOMY – RETROSPECTIVE CASE ANALYSIS

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Keywords. Percutaneous endoscopic gastrostomy (PEG), survival, nutrition.

Introduction. PEG tube placement is a common endoscopic procedure and has noticeably lower complication rates and 30-day mortality, unlike surgical methods. It is widely used for patients with swallowing difficulties and functioning gastrointestinal tract for long term nutritional support. The most common indications for PEG placement are cerebrovascular diseases and cancer related swallowing difficulties. PEG is not recommended for patients with transient swallowing difficulties, short life expectancy and is less beneficial for patients with dementia.

Aim. Determine common complications after PEG procedure in Pauls Stradiņš Clinical University Hospital (PSCUH), and evaluate prognostic factors which can affect patient survival after PEG placement.

Materials and methods. Patients who underwent PEG procedure from 01.02.2014 to 01.12.2017 were selected from PSCUH Endoscopy database. From patient records we collected data about sex, age, dates (admission, PEG procedure, discharge or death), primary diagnosis, complications, underlying diseases, length of nasogastric (NG) tube use, antibiotic, anticoagulant and anti-aggregant use before and during PEG procedure, analgesics use, laboratory analysis (albumin, thrombocyte levels).

Results. 77 patients were selected in ages from 23 to 88, with median age of 66.5 and mode – 75 years. Reasons for PEG placement were: stroke, amyotrophic lateral sclerosis, oropharyngeal cancers. Average NG tube feeding time was 15.85 days (2–87 days) and only 12 patients had it longer than 30 days. 8 patients received specific antibiotic prophylaxis, for 2 specific antibiotic prophylaxis did not meet recommended antibacterial spectrum. 17 patients had minor complications after PEG insertion. 16 patients noted complaints like pain, discomfort and painful palpation around insertion site. One patient had nausea, one – diarrhea and one – peristomal leakage. 7 patients had major complications – 4 had aspiration, from whom one with further cardiopulmonary resuscitation, and 3 pulled out PEG tubes. One patient had PEG removal after 13 days during hospital stay. Re-hospitalization was needed for 4 patients: one had PEG dysfunction, for one the tube fell out; two were re-admitted for PEG removal. Overall estimated median survival is 50 days, but mean estimated survival after PEG procedure is 274.8 days due to few patients with long survival time.

Conclusion. There was no impact of major complications on survival time after PEG procedure. Neurological patients had statistically significant longer mean and median survival time than oncological patients. And PEG tube placement in patients with dementia was less beneficial due to major complications.
ANTIOXIDANT CAPACITY AND ACTIVITY IN APPLES GROWN IN LATVIA IN 2017

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**Keywords.** Antioxidants, apples, polyphenols, DPPH, FRAP, ABTS.

**Introduction.** Fresh apples are a source of fiber, vitamins, minerals and antioxidants from which the major are polyphenols that limit the effect of free radicals on human cells and therefore have a high nutritional value. Apples are one of the most commonly grown, also affordable fruits in Latvia, the quality and chemical composition can be affected by the harvesting time and methods, storage conditions. Antioxidant value in fruit is highly affected by environmental conditions, apples analysed in the research were harvested in fall season 2017 and during summer of 2017 were exposed to relatively lower temperatures and rainy conditions.

**Aim.** To determine the antioxidant capacity and activity in vitro in several common apple varieties grown and harvested in Latvia in 2017 fall season.

**Materials and methods.** The research was carried out at internationally certified Laboratory of Biochemistry of Rīga Stradiņš University. The capacity of antioxidants and their activity was determined using 4 assays: total polyphenol status (Folin-Ciocalteu method), radical scavenging ability in vitro radical generating model systems (DPPH and ABTS) and ferric reducing antioxidant power assay (FRAP). All methods included use of instrumental analysis with spectrophotometry. 6 examples of 5 fall apple cultivars, including “Auksis”, “Delikatese”, “Rubins”, “Tiina” and industrially made mixed juice of the same cultivars were analysed with methods mentioned above.

**Results.** Among 6 selected samples, the highest polyphenol content was determined for “Delikatese”, 1.854 mg/ml GSE, while the lowest value was determined for “Tiina”, 0.553 mg/ml GSE. There was no significant difference in polyphenol content between two samples of the same cultivar “Auksis” from two orchards, respectively, 1.237 mg/ml and 1.267 mg/ml GSE. Variety “Rubins” and industrially made apple juice showed average score in all methods compared to other cultivars separately, 0.873 mg/ml and 0.839 mg/ml GSE. The radical scavenging ability determined with DPPH and ABTS methods and total polyphenol status showed a strong correlation with coefficients 0.978 and 0.980. Also, ferric reducing antioxidant power was determined to be the highest for cultivar “Delikatese”, 13.82 mmol Fe²⁺, the lowest for “Tiina” 1.75 mmol Fe²⁺ and showed strong correlation with a coefficient of 0.945 for all the samples.

**Conclusion.** The polyphenol content and activity differ significantly among apple varieties and is similar for examples of the same cultivar from different orchards as shows the analysis of “Auksis”. Total polyphenol status and antioxidant activity was determined to be the highest for variety “Delikatese”, which suggests it is the least affected by inadequate weather conditions and a good source of antioxidants despite the season, but further research is required.
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TRUFFLES WITH VITAMINS AND MINERALS FOR VEGANS

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Keywords. Vegan, truffles, manufacturing.

Introduction. In recent years more and more people are turning to a vegan diet. Although well planned vegan diet contains all the nutrients that people need to remain strong and healthy, there are some nutrients which vegans should take additionally.

Aim. The aim of this study was to explore recipe and create technology for oral chewing form-truffles. After preparation product had to pass organoleptic test, microbiological test, stability test, accelerated storage test.

Materials and methods. It was determined that one truffle must contain 10% RDIs of all the vitamins and minerals, which usually vegans diet is deficient for. The study included three type of truffles. The main ingredients were the same, but there were three different kinds of coating- cranberry powder (1), sea buckthorn powder (2) and chia seeds (3). As the main ingredients were dried dates, and dried sea buckthorn pulp which is leftover after squeezing berries. After adding vitamins (A, D, E), minerals (Mg, Ca) and preservatives truffles were handmade. Microbiology testing was done on Plate count agar (to determine total microbial growth), Malt extract agar (to determine yeast and mould) and Endo agar base with basic fuchsine (to determine Escherichia coli). Determination of total phenol content was done two times by Prussian blue assay. Accelerated storage tests were done at three time points (0, 3, 6 months) 40 °C ± 2 °C / 75% ± 5% RH. Real time storage tests still ongoing 25 °C ± 2 °C / 60% ± 5% RH.

Results. The mean truffle weight was 8.8 g (8.5–9.0 g). Loss on drying 6.0% ± 0.1%. After microbiological testing E. coli was not detected. There were detected 45 CFU of yeasts and mould in 1g of the product. The total phenol content assay showed following results: for the freshly made (1) truffles – 85.30 ± 7.20 mg Gallic Acid Equivalent (GAE) /100 g; (2) truffles – 79.60 ± 3.44 mg GAE / 100 g; (3) truffles 63.75 ± 4.19 mg GAE/100 g. After twenty days the total phenol content were (1) truffles 71.80 ± 6.77 mg GAE/100g; (2) truffles 55.10 ± 5.32 mg GAE/100 g; (3) truffles 44.75 ± 3.22 mg GAE/100 g. Accelerated storage test showed that product shelf life should be 15 months. Truffles passed all the microbial and organoleptic tests, and showed good stability.

Conclusion. The technology of making truffles was developed, and soon they will be manufactured by Institute of Innovative Biomedical Technology.
THE RELEASE OF PELARGONIUM SIDOIDES ROOT EXTRACT FROM PORCINE COLLAGEN HYDROGEL

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Keywords. Periodontal disease, Pelargonium sidoides, porcine collagen hydrogels, pharmacokinetic profile.

Introduction. Periodontitis is common chronic disease caused by bacteria affecting more than 10% of the adult population. Novel treatment strategies are necessary to avoid systemic side effects of the antibiotics and synthetic antiseptic substances, and to fight the increased resistance of the bacteria. Pelargonium sidoides root extract has the moderate antibacterial effect, interfering with invasion and adherence of microorganisms. Mucoadhesive drug delivery system with Pelargonium sidoides root extract could be advantageous by maintaining optimum levels of antimicrobial substances on periodontal inflamed surface area for a sustained period of time.

Aim. The aim of the study was to measure the release of Pelargonium sidoides root extract from porcine collagen hydrogel matrices and test how the presence of amylase affects the kinetic profile.

Materials and methods. Powdered standards and 8% porcine collagen hydrogel samples with active compounds of Pelargonium sidoides root extract (PC-PS1 and PC-PS2, Lithuanian University of Health Sciences) were supplied by Ferentis (Lithuania). Hydrogel samples were incubated in 5 ml PBS buffer solution (pH = 6.5) without or with 100 U/ml amylase at + 37 °C to test the release kinetics of active compounds of Pelargonium sidoides root extract. 100 μl of media was sampled at the beginning of incubation (0 point), and after 2, 4, 6 and 7 days. Hydrogels were homogenized by using bead ruptor and ultrasonic homogenizer in PBS (1 : 200 w/v) for determination of active compound concentrations. The absorption of obtained samples and standard solutions was recorded on a Bio-TEK µQant spectrophotometer at 280 nm.

Results. The standard curves of active substances at concentrations in a range from 1–0.008 mg/ml were made to calculate the extract amounts in hydrogels and incubation media after incubation. The active ingredients started to appear in the incubation media immediately after the start of sample incubation and reached concentration of 0.3 mg/ml after 2 days of incubation. After 7 days of incubation only 0.8 % of PC-PS1 was released from PC-PS1 hydrogel that contains approximately 222 mg of PS1, while from PC-PC2 hydrogel (114 mg of PC2) – 1.3 % of PC-PS2 was released. Presence of amylase in the incubation media did not significantly change the amount of released substances after the long-term incubation.

Conclusion. During the incubation of samples only about 1 % of Pelargonium sidoides root extract active compounds were released. Further studies are necessary to obtain improved mucoadhesive drug delivery system with Pelargonium sidoides root extract.
OREGONIN’S INTERACTION WITH METABOLITES
OF CARBONHYDRATE AND LIPID METABOLISM

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Keywords. Oregonin, metabolites, metabolic syndrome.

Introduction. Metabolic syndrome is one of risk factors of developing cardiovascular diseases, that are most common reasons of death in Europe, US and other developed countries. Oregonin is diarylheptanoid, that can be extracted from Grey alder’s bark. It has ability to lower cholesterol levels in blood, therefore prevent some cardiovascular diseases.

Aim. The research was performed to assess oregonin’s effect on metabolites, such as cholesterol and pyruvic acid.

Materials and methods. Oregonin’s effect on metabolites were assessed in vivo and in vitro. In vivo data about concentrations of metabolites in blood were obtained from Latvian Scientific – Practical Centre and Clinics of Medical and Cosmetic Dietetics “AKDS”. For in vitro part of research, a simulation solution of blood plasma was made from 0.9% NaCl solution and individual metabolites (pyruvic acid and cholesterol) in different concentrations – normal, high and low. Oregonin was made by Latvian State Institute of Wood Chemistry. For in vitro part of research was performed pyruvic acid reaction with 2,4-dinitrophenilhidrazine and Liebermann-Burchard test for cholesterol. To assess concentration changes, spectrophotometric method was used.

Results. Decrease of concentration of pyruvic acid was found in samples with mixture of different extracts which were dissolved in water and ethanol: in samples with low pyruvic acid concentration (0.0079 mg/ml) average concentration decrease is 0.0012 ± 0.0003 mg/ml, decrease of normal concentration (0.0129 mg/ml) is 0.0109 ± 0.0005 mg/ml, decrease of high concentration (0.0264 mg/ml) is 0.0140 ± 0.0015 mg/ml. Samples with different concentration of pyruvic acid and pure oregonin dissolved in ethanol and water showed bigger absorbance than initial absorbance of the sample with low, normal and high concentration respectively – 84 %, 78 %, 67 %. Samples with different cholesterol concentrations showed bigger absorbance than initial absorbance of the sample with low, normal and high concentration respectively – 42 %, 64 %, 67 %. In group of the people with high cholesterol concentration in the blood the decrease of concentration is 0.98 ± 0.27 mmol/l.

Conclusion. Increase of optical density may be explained by hypothetical supposition that oregonin makes complex compounds with pyruvic acid and cholesterol which do not allow light beam to go through. However, it is possible that mixture of the extracts decreases pyruvic acid because it makes complex compounds that allow light beam to go through. The data from in vivo research showed us that pure oregonin has a hypocholesterolemic effect, so we can conclude that pure oregonin can interact with lipids after chemical transformations in the digestive tract.
ACTION OF VARIOUS TREE BARK EXTRACTS ON ACTIVITY OF AMYLASE

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Keywords. Tree bark extract, α-amylase, amylolastic power, proanthocyanidins.

Introduction. α-Amylase is an enzyme responsible for degradation of glucose polymer starch into its constituents amylopectin and amylose and therefore for the first phase of its digestion. Starch is a polysaccharide, major dietary carbohydrate. Tree peels low cost by-product from manufacture of wooden products, which is common in Latvia which contain high amount of bioactive substances including proanthocyanidins (PAC), belonging to a class of polyphenolic compounds. The amylase activity is characterized with amylolastic power, that is the volume of the 0.1 % starch solution in ml that is hydrolyzed by 1 ml of undiluted saliva at 38 °C for 30 min.

Aim. To determine the effect provided by tree bark on activity of α-amylase in vitro and to examine whether total PAC content of extracts affect these results.

Materials and methods. The research was carried out at certified Laboratory of Biochemistry of Rīga Stradiņš University. The saliva used for research was donated by a student with no record of chronic or acute illness, last meal was 2 hours before examination to get clean results. Extracts used in this research were extracted from grey alder (Alnus incana), black alder (Alnus glutinosa), and goat willow (Salix caprea) tree barks with a one-step method using water or 50 % ethanol as a solvent. Additionally, bark of grey alder was sequentially extracted using water and 50 % ethanol. PAC chemical composition of each extract was obtained from Latvian State Institute of Wood Chemistry. Each extract was observed in concentrations of 50, 100 and 300 µl, sets for analysis consisted of 10 test tubes for each extract concentration. The results were visually compared to control sets by colour differences between test-tubes.

Results. Water extracts from grey alder show amylase activity enhancement with 50 and 100 µl concentrations. Water extracts from grey alder using sequential extraction and willow show amylase activity enhancement with all concentrations. Water extracts from black alder show amylase inhibition with all concentrations. Both ethanol extracts from grey alder shown no activity with any of concentrations. Ethanol extracts from black alder and willow shown amylase-inhibiting activity with all concentrations. 300 µl 50 % black alder extract has shown the strongest inhibiting activity among all extracts.

Conclusion. Examined tree bark extracts have shown both activating and inhibiting activity of α-amylase. Extract activity may be regulated by the presence of separate specific phytochemicals or a combination, but not due to total PAC content. The extracts could be used for therapeutic purpose to either increase or decrease the activity of α-amylase, further research is needed.
BIOEXTRACTS ACTIVITY ON PANCREATIC LIPASE IN MODELS OF DUODENAL DIGESTION

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Keywords. Bioextracts, lipase, obesity.

Introduction. Obesity is a worldwide problem and a risk factor of various diseases. The newest trends have focused on plant-based extracts with lipase inhibition activity. The bark is rich of diarylheptanoids and proanthocyanidins, which have some known effect on pancreatic enzymes. The research is a screening step for the COST FA 1403 Project, exploring bioextracts provided by The Latvian State Institute of Wood Chemistry.

Aim. To evaluate the activity of lipase under the action of certain bioextracts in physiological and no bile models of duodenal digestion phase.

Materials and methods. Standard set for intestinal digestion: milk (the source of triglycerides), porcine pancreatin solution, bile, phenolphthalein, NaOH and 50 μl, 100 μl, 300 μl of 50 % ethanol extract and water extract of: Grey Alder, Grey Alder (sequancial extract), Black Alder, Willow extract (Latvian State Institute of Wood Chemistry). Controls with and without bile were performed, results were compared.

Results. The difference of NaOH titrated was divided in groups: ≥ 0.8 μl between the control and extract-containing model was named as remarkable; ≥ 0.4 μl as medium; < 0.4 μl as insignificant. A remarkable inhibitory effect on pancreatic lipase with the addition of bile had 100 μl Grey Alder 50 % ethanol extract (sequential and non-sequential), 100 μl Black Alder 50 % ethanol extract, 100 μl Willow 50 % ethanol extract. However, remarkable activator effect was seen in the 50 μl samples of Grey Alder 50 % ethanol sequential extract, 50 μl Willow 50 % ethanol extract and 100 μl Grey Alder water extract. The other samples showed medium or insignificant inhibition or activation of lipase. All the samples without bile showed insignificant activator effect of the extracts, the difference between the control and extract-containing model being ≤ 0.3 μl.

Conclusion. Remarkable inhibitory effect of the extracts on pancreatic lipase was detected when added 100 μl of Grey Alder 50 % ethanol sequential or non-sequential extract, Black Alder 50 % ethanol extract, or Willow 50 % ethanol extract. The percentage of proanthocyanidins in the extract does not correlate with the activity of lipase detected in the experiment. The activity of the extracts is dose – dependent. Knowing the impact on pancreatic lipase activity and other health benefits of the extracts, they should be further investigated as a potential component of anti-obesity drugs.
ALTERATIONS IN BRAIN CREATINE CONCENTRATIONS UNDER LONG-TERM SOCIAL ISOLATION

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Keywords. Social isolation, stress, creatine, creatine phosphate, energy metabolism.

Introduction. Long-term social isolation can be the inducer of mental stress conditions, which have negative impact on energy metabolism of cell, thus changing drastically cellular homeostasis. One of the main buffering and transferring systems for maintaining energetic balance is creatine kinase/ creatine/ creatine phosphate (CK/Cr/PCr) shuttle. This pathway is mostly important in tissues with high and fluctuating energy demand, such as neural and muscular tissues.

Aim. The main goal of the study was to determine alterations in creatine concentration and observing its synthesizing and transporting systems in brain under long-term isolation to fulfill understanding of influence of such conditions on living organism.

Material and methods. The experiments were conducted on 60 adult male laboratory rats divided into two groups. Group 1 (30 rats) – control group (C-group) – were kept in common cage, while group 2 (30 rats) – stressed rats (S-group) were maintained in individual cages for 30 days. Intracellular Cr and ATP contents were measured by colorometrical assay kits. The optical density was read on microplate reader at 570 nm. Creatine and ATP concentrations were calculated according to the standard curves. PCr determination assay depends on enzymatic conversion of PCr, by which NADP+ is reduced. Reduced NADPH is then measured spectrophotometrically at 570 nm. CK concentration was measured by ELISA assay kit and the optical density was read at 450 nm.

Results. The Cr content of rat brain was measured and the results showed that under long-term isolation Cr concentration was increased for about 45%, while PCr was decreased for about 46%. Estimations showed that after 30 days of isolation, the amount of ATP was decreased in S-group individuals compared to the C-group, thus displaying down-regulation of energy metabolism under stress. The amount of the enzymes involved in the Cr synthesizing pathway dropped, the content of the Cr transporter also decreased.

Conclusions. To summarize the results, it can be easily shown that while the Cr concentration in brain under stress conditions increases, the amount of enzymes taking part in its synthesis drops, which could be a sign of down-regulation of endogenous production of creatine. To sum up all the results, it could be easily declared that 30-day social isolation stimulates formation of acute psycho-emotional stress that leads to the down-regulation of energy metabolism and ATP deficiency.
FEATURES OF THE MEDICATION ADMISSION BY RĪGA STRADIŅŠ UNIVERSITY STUDENTS FOR MEMORY AND CONCENTRATION OF ATTENTION IMPROVEMENT

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Keywords. Memory, concentration of attention, nootropic.

Introduction. Students experience a great mental stress during the preparation for exams and colloquiums. In this relation, the problem becomes urgent – how it is possible to increase the ability to concentrate attention and to improve memory.

Aim. The aims of this study is to find out, which medicines students of Rīga Stradiņš University take to improve their memory and ability to concentrate attention and to figure out, how students assess the impact of these drugs on their memory and ability to concentrate their attention.

Materials and methods. Respondents of the study are students of RSU who live in the Students Dormitory. Using Microsoft Excel 2013 random number generator, the rooms of the Dormitory were randomly selected. Residents of selected rooms were interviewed using a questionnaire that included questions about what medications they took to improve their memory and ability to concentrate attention, about the period of their admission and how those medications affected memory and concentration of attention during their admission and during the first two weeks after the end of admission. The obtained data were analyzed using IBM SPSS Statistics 22.

Results. In the course of the study, 127 students of RSU were interviewed. 17 students of all respondents (13.4 %) noted that they had taken at least one medication to improve memory and concentration of attention. Of those having taken medications, two nootropics were noted more often – Piracetam (7 students – 41.2 %) and Phenibut (6 students – 35.3 %). Of those having taken Piracetam, 4 (57.1 %) noted that they had taken it preparing both for colloquiums and for exams. During the use of Piracetam 2 students (28.6 %) noticed that their memory improved and 3 (42.9 %) – that their ability to concentrate attention improved. 6 (85.7 %) noted that both memory and ability to concentrate attention improved in the first 2 weeks after the end of Piracetam intake returned to the same level as before its admission. Those who noted Phenibut had taken it only during the session. During its use, 1 student (16.7 %) noticed that the memory improved, but 4 (66.7 %) – that their ability to concentrate attention improved. In the first 2 weeks after the end of Phenibut admission, 5 (83.3 %) noted that both memory and concentration of attention returned to the same level as before its admission.

Conclusion. A small number of students take medicines to improve their memory and concentration. The most frequently used drugs among the students are 2 nootropics – Piracetam and Phenibut. During their admission, the memory improves slightly, but the ability to concentrate attention significantly improves. After the intake of these medications, both memory and ability to concentrate attention returned to the baseline in almost all the students.
ADJUSTMENT OF PHARMACOTHERAPY FOR PSYCHIATRIC PATIENTS WITH TUBERCULOSIS IN STRENČI PSYCHONEUROLOGICAL HOSPITAL

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Keywords. Tuberculosis, psychiatric treatment, drug interactions.

Introduction. Treatment of TB is managed with drugs that are metabolized by CYP450 in the gastrointestinal tract and liver. A lot of potential interactions are in the treatment of psychiatric conditions, which holds both risks for anti-tuberculosis (anti-TB) and psychiatric drugs effectiveness. Reduced anti-TB plasma concentration might result in unsuccessful therapy outcome, an increased resistance to the specific agents which may lead to untreatably resistant strain. Strenči Psychoneurological Hospital (SPH) is the only institution which provides psychiatric treatment for adults with TB and holds the only psycho-tuberculosis unit in Latvia.

Aim. The aim of the study was to identify most common anti-TB drugs interaction problems for patients treated in SPH.

Materials and methods. The study was conducted retrospectively using SPH patients’ medical histories from 2015–2017. Following criteria was specified to include patients in the study – diagnosed TB (SSK-10 A15–A19), diagnosed psychiatric condition (SSK-10 F00–F99), treatment in SPH for at least 2 months, co-administration of anti-TB therapy and at least one drug for the psychiatric condition. Data was analyzed searching for drug interaction with anti-TB agents, possible metabolic enzymes related to it.

Results. Totally data from 53 patients’ medical histories was collected. Overall distribution by age and gender was 81.1 % (43) male, 18.9 % (10) female with average age 49.7 years old (22–79). In average patients received 8.4 (5–15) medications at a time, which shows the rate of polypharmacy 100 %. During pharmacotherapy analysis 37 types of interactions with anti-TB drugs were identified, in total 166 interactions found resulting in an average 3.1 drug interactions per patient (0–9). It was found that 89.2 % (148) of these interactions with anti-TB drugs were related to Rifampicin and Isoniazid. The most common CYP450 enzymes involved in found interactions were CYP3A4 72.3 % (120), CYP2D6 13.9 % (23) and CYP1A2 9.0 % (15). One case of interaction was identified (bedaquilline-carbamazepine), that might affect tuberculosis treatment outcome by lowering anti-tuberculosis agent plasma concentration.

Conclusion. Tuberculosis treatment in psychiatric patients holds a great risk of possible drug-drug interaction, all cases in this study were identified as polypharmacy, which should require detailed analysis of all involved drug metabolism. Most interactions are in therapy with commonly used anti-TB agents – Rifampicin and Isoniazid. Both medications interact with most drugs, because of the high susceptibility to CYP450 enzymes. The largest risk is related to interactions that might decrease anti-TB plasma concentration.
GREAT CONSUMPTION OF ANTIBIOTICS LEADS TO INAPPROPRIATE USE

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Keywords. Antibiotics, usage, antimicrobial resistance.

Introduction. Antimicrobial resistance is a growing problem among people of any age due to lack of patients’ knowledge about appropriate use. It can be reduced by finding out the primary difficulties regarding utilization of antimicrobial agents.

Aim. The main goal of this research was to analyze more common patients’ mistakes during antibiotic treatment.

Materials and methods. Prospective quantitative study was conducted from December 2017 to January 2018 in Kazakhstan and Latvia. The data such as age, gender, experience with antibiotics usage was obtained by anonymous questionnaire and analyzed using SPSS software.

Results. Data were collected from 100 patients (50 from Kazakhstan and 50 from Latvia), mean age was 30.1 ± 8.0 years. Almost half of the population experienced antibiotic usage at least one or two times per year in both countries (41.0 % vs. 59.0 %). It was seen that Latvians were not likely to undergo the complete course of antibiotic treatment in comparison with situation in Kazakhstan, 54.2 % vs. 45.8 %, respectively (p = 0.018). Reasons of incomplete course of antibiotics were improvement in health condition (53.4 %), price (56.7 %) and presence of side effects such as rush (21.6 %) and diarrhea (29.5 %) from patients’ perspectives. Most inappropriate usage of antimicrobials was related with remains of it for later use more frequently in Latvia than in Kazakhstan (85.1 % vs. 68.3 %; p = 0.043) and with expenses for full treatment course as purchasing half of amount of medicine (10.0 % vs. 34.0 %; p = 0.007) especially in cases of impossible alternatives substitution (76.0 % vs. 62.0 %; p = 0.007). There was a representative difference among Latvian patients asking for antibiotics without prescription according to age, respectively, 30 to 50 years old – 84% and more than 51 years old – 8 %; p = 0.021. The data such as never (34.0 %) or rarely vaccinated (12.8 %) showed that vaccination was not a priority for study population in Latvia (p = 0.0001).

Conclusion. Great antibiotics consumption, incomplete course of treatment and purchase of antibiotics without prescription were leading reasons of inappropriate use of antibiotics. Inadequate use of antimicrobials primarily lied in patient-related factors such as self-medication and poor adherence to dosage regimens.
SELF-MANAGEMENT PLANS FOR ASTHMA CONTROL
AND PATIENT COMPLIANCE WITH IT

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Keywords. Asthma, controlled, self-management plans.

Introduction. Asthma is a chronic lung disease that inflames and narrows the airways and it is the most common chronic disease around the world. From it suffer about 235 million people and the number of patients is increasing every year. For that is many reasons – environmental pollution, the use of various household chemicals, unhealthy lifestyles and an increase in the number of smokers.

Aim. The aim of the study was to assess the compliance of patients in the control of asthma with the asthma control test and some additional questions that affect the treatment of asthma.

Materials and methods. I conducted face-to-face interviews with 66 asthma patients. Each of them completed a questionnaire that addressed five asthma domains: symptoms; the impact of asthma on quality of life; perception of asthma control; exacerbations; and treatment/medication. The data were collected from November to December 2017 with anonymous survey help. Patient’s ability to control asthma was appreciated over the past 4 weeks.

Results. Data was collected from 66 patients with an average age of 50.08 ± 19.6 years. The majority of patients were women (n = 53, 80.3%). Regarding activities of daily living, men’s population experienced greater asthma-related limitation in normal physical exertion, social activities and as well as higher interference with life 61.6% vs. 37.8% (p = 0.06). Another relevant aspect was shortness of breath, which in men was observed 3–6 times per week, what was more than women, 38.5% vs. 13.2% (p = 0.179), but women more often had nocturnal asthma than men, 56.6% vs. 46.2% (p = 0.63). The use of “rescue” sprays was higher in men than in women, 69.2% vs. 41.5% (p = 0.29). Males had much worse “self-management plans for asthma control” than females. Only 5 (7.6%) patients of all think that they had full control of asthma. But actually only 3 (4.5%) patients had well-controlled asthma, 31 (47%) patients had partly controlled asthma and 32 patients (48.5%) had uncontrolled asthma. One third, 22 (33.3%) patients were smokers, 6 (9.1%) exsmokers. The majority of patients – 49 (74.2%) every 3–6 months visited a doctor. The inhalers, which were most used were metered-dose inhaler – 32 patients (48.5%). 53 (80.3%) patients admitted that they had contact with allergens. Concomitant diseases were observed in 49 (78.8%) patients.

Conclusion. With the help of asthma control test, was found that mostly patients had partly controlled asthma or uncontrolled asthma. Frequent asthma attacks are caused by the patient’s exposure to allergens and smoking. Other diseases also could affect asthma, because patients with multiple diseases paid different attention and importance to asthma.
ANALYSIS OF INTERACTION RISKS FOR PATIENTS OCCURRING AS A RESULT OF WARFARIN INTAKE CONCOMITANTLY WITH OTHER MEDICAL SUBSTANCES

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Keywords. Warfarin, drug interaction.

Introduction. Warfarin is an anticoagulant, which inhibits the synthesis of clotting factors. Various medical substances can interact with warfarin during the pharmacokinetic processes. This can cause an increase or decrease of warfarin concentration, affect its therapeutic effect as well as reinforce the side effects of medicines. The prothrombin time test is typically used to control the effect of warfarin. The results of the tests are then expressed as international normalized ratio (INR).

Aim. The aim of study was to investigate which medical substances are most frequently used with warfarin and to analyze how various drug combinations influence INR.

Material and methods. 75 patients undertaking warfarin therapy were interviewed in hospitals over the period from February to December 2017. The questionnaire included questions about the usage of food supplements and medicines. Based on the criteria outlined on www.drugs.com, all medical substances were subdivided into 3 groups according to the strength of their interaction with warfarin: major, medium and minor. The blood test was used to determine the INR value. The values of INR less than 2.0 and over 4.0 were considered, respectively, as ineffective therapy and an overdose.

Results. The mean age of study population was 69 years (SD 11.28). 47 % of patients were males and 53 % – females. 86.67 % of patients used warfarin together with medical substances interacting with warfarin. 20.0 % used major interacting drugs, 42.67 % – medium interacting drugs and 73.33 % – minor interacting drugs. From the minor interaction group, 38.67 % of patients used atorvastatin, 30.67 % – spironolactone and 17.33 % – hydrochlorothiazide. The most frequently used drug from the medium interaction group was omeprazole – 17.33 %, from the major interaction group – aspirin (9.33%). For 70.67 % of patients the therapy was within the INR range of 2.0–4.0 (i. e. effective therapy). 13.33 % had an ineffective therapy and 6.67 % had an overdose. 9.33 % of patients refused to check INR. Average INR value in the major interaction group was 2.10, in the medium interaction group – 2.43 and in the minor interaction group – 2.84.

Conclusion. The majority of patients used drugs, which may have influenced warfarin effectivity. However, the majority of patients had an INR value within the normal range of 2.0–4.0. This suggests that doctors normally succeed in controlling the interaction symptoms of warfarin with other medical substances in order to get a desired therapeutic effect while preventing an overdose.
EVALUATION OF PATIENTS’ KNOWLEDGE ON
ANTACID AND ACID-REDUCING MEDICATION USE
IN COMMUNITY PHARMACY SETTINGS

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Keywords. Antacids, community pharmacy, patient education, pharmaceutical care, OTC.

Introduction. Due to the high prevalence of heartburn and regurgitation in general population and the variety of available OTC treatment options, individuals commonly seek treatment and symptom relief in the community pharmacy setting. Patient’s adherence to the treatment has an important impact on a patient’s response to the therapy. Pharmacist are, therefore, ideally positioned to counsel those individuals and help them make informed self-care decisions by ensuring that therapy is used in safe and effective manner.

Aim. Objective of this study is to measure the impact of pharmacists’ counseling on patient knowledge on antacids, proton-pump inhibitors and histamine-H2 receptor antagonists (H2RAs) and estimate patients attitudes regarding the consultation process.

Materials and methods. Study took place in the community pharmacy in Jurmala, Latvia, for a period of time from October till November 2017. Patients visiting the community pharmacy with the intention to buy OTC antacids, histamine-H2 receptor antagonists, or proton-pump inhibitors were invited to complete pre-and post- consultation multichoice questionnaire. Information on age, education, sex, and previous use of medicine was also collected.

Results. Total of 37 (n = 37) participants completed the pre and post questionnaire. Improvement in patient’s knowledge after community pharmacy counseling was statistically significant. Knowledge on drug interactions and regimen improved at the highest rate after counseling (22%; p < 0.05). Patients who had used antacids previously were more likely to give correct answers before community pharmacist counseling, however the improvement in knowledge after the counseling was still statistically significant. Participants consider both pharmacists and doctors to be responsible for explaining possible adverse effects of medicine, however, the majority put this responsibility exclusively on doctors (41 %). In case of insufficient information on medicine the majority of participants (57 %) would seek it elsewhere, and only 16 % would consult a pharmacist. Patients with no previous experience with studied medicine were more likely to seek the insufficient information on medicine elsewhere (71 %).

Conclusion. Community pharmacists have a potential to improve patients’ knowledge regarding the use of medicines, however people are not likely to consult a pharmacist in case of insufficient information. It is important to promote optimal, effective and safe use of OTC antacids. This could be achieved through regular training of pharmacists and ensuring suitable environment for consultations.
ANALYSIS OF MODIFICATING FACTORS DURING OSTEOPOROSIS THERAPY

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Keywords. Bone mineral density, osteoporosis, risk factors.

Introduction. It is proven that smoking, abnormal body mass index (BMI), various medications can increase the risk of osteoporosis development. Furthermore, compliance during osteoporosis therapy can vary in different patient groups.

Aim. The aim of the study was to evaluate effect of different factors (patient compliance, BMI, comorbidities, polypharmacy, smoking) on osteoporosis treatment.

Methods. Retrospective quantitative study design was chosen to be appropriate. 208 patients who had Dual-energy X-ray (DXA) absorptiometry were identified by archive search in a university hospital (2014–2017). Inclusion criteria: patient had at least two DXA measurements in the last 3 years, at least two vertebrae L1–L4 had a T-score of −2.5 or lower, patients were consulted at the same hospital. 41 patients met inclusion criteria. The following data were studied: patient age, gender, osteoporosis treatment schemes, comorbidities, comorbidity medications, body constitution, body mass density (BMD), T- and Z-score, compliance and smoking history data. BMD increase was calculated as a difference between 2017 and 2014, expressed in percent. Statistical analysis was performed using SPSS 23.

Results. Mean age of the study group was 66.8 ± 9.2 years, mostly females (97.6%). Mean BMI was 25.30 ± 1.71 kg/cm², BMI over 25 was in 50% of cases. Patients had more than 3 diseases in 20% of cases, respectively used more than two medications in 52.5% of cases caused by comorbidities. In 85 ± 11.25% of cases patients were compliant and 22.5 ± 12.5% were smokers. There was no statistically significant BMD increase difference in groups of smokers and nonsmokers, mean rank 19.52 vs. 23.89 (p = 0.337), also no correlation between BMI and BMD increase (p = 0.245), BMI (18.5–25.0) group had mean rank 16.47, BMI (< 18.5 and > 25.0) group 22.92. There was statistically significant association between Z-score and patient age (p = 0.009, r = 0.41). Compliant patients had significantly higher BMD increase, respectively, BMD mean rank for compliant patients was 38.13, for non-compliant 18.53 (p = 0.043).

Conclusion. The majority of study population had at least one osteoporosis progression risk factor. Patients with no compliance had lower results gaining BMD. Older osteoporosis patients had better BMD comparing to age average, possibly as their osteoporosis had been treated longer. There was a tendency for patients treated with stroncium ranelate, alendronate sodium and acidum zolendronicum combinations with calcium and cholecalciferol to had better BMD improvement results. Patients with normal BMI tended to have lower increase of BMD, therefore lower baseline score could be accountable.
INCIDENCE OF POLYPHARMACY AND ASSOCIATED RISK IN PHARMACOTHERAPY OF GERIATRIC PATIENTS

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Keywords. Medication, compliance, beers criteria.

Introduction. Today very often more medications at the same time are prescribed, which leads to polypharmacy. Polypharmacy is one of the topics today, especially for geriatric patients after the age of 65, reduces the quality of life and increase the adverse clinical effects that can contribute to disease and mortality. It is recommended to use the BEERS criteria for optimization of pharmacotherapy in geriatric patients. These criteria help to eliminate undesirable side effects by optimizing drug therapy in geriatric patients.

Aim. To determine the incidence of medications from Beers criteria during geriatric prescriptions. Tasks were (1) to find out the frequency of polypharmacy among geriatric patients, (2) to collect and analyze situations with the use of potentially non-recommended medication in accordance with Beers criteria recommendations.

Materials and methods. The retrospective quantitative study was performed by including participants older than 65 years from social care center. The following data were collected from the medical history cards: sex, age, the total number of medications, the total number of active substances, total number of central nervous system affecting substances and other in the Beers criteria included medications.

Results. The study involved 50 people with average age of 80 years. More than half were women (58%). The average number of co-administered active substances was 5.5, respectively, for women 6.2 and for men 4.6 (p = 0.027). More than half of patients (56%) used central nervous system affecting medications. Of these, 56% of patients use the central nervous system medications (antidepressants, antipsychotics (neuroleptics), anti-parkinson medicine, opioid analgesics) in combination with benzodiazepines and tricyclic antidepressants (amitriptyline). 24% of patients used benzodiazepine medications. Digoxin in dose 0.25 mg was prescribed in 6% patients, spironolactone in dose 25 mg was used in the treatment for 20% patients. 4% patients received digoxin in dose 0.25 mg in combination with spironolactone 25 mg at the same time. Diclofenac 100 mg as pain killer was used in 16% patients. Amitriptyline 10 mg was prescribed in 6% patients. 4% patients were taking small dose aspirin in combination with NSAIDs.

Conclusion. Polypharmacy was detected in 22% of study patients. Everyone had at least 1 medication which was potentially non-recommended by Beers criteria. 50% of patients had potentially non-recommended drug combinations. Patients in older group more often had non-recommended medications combinations and need for more attention during prescribing process.
IBUPROFEN CONSUMPTION TRENDS AND ASSOCIATED RISKS

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Keywords. Ibuprofen, interactions, combinations.

Introduction. Ibuprofen is non-steroidal anti-inflammatory drug (NSAID) with fast growing sales – an average 670 packages each month. According to State Agency of Medicines provided data ibuprofen is the most sold over-the-counter drug in Latvia, whose sales in 2016 was 5.81 million euros. Therefore, arise doubts whether ibuprofen is used correctly considering drug indications and also in safe combinations with other drugs. As known ibuprofen can lower efficacy of antihypertensive drugs by increasing arterial blood pressure, which can lead to increased risk of cardiovascular events. Combining ibuprofen with other NSAID efficacy decreases but risk of side effects for example stomach or intestine ulcer increases.

Aim. The aim of the study was to observe ibuprofen combinations with other drugs to analyse potential risk of interactions.

Materials and methods. Retrospective quantitative study was conducted from August to November in 2017 including 100 purchase episodes from the pharmacy cash register system which contain at least one ibuprofen medication together with other oral medicines. The results were analysed with IBM SPSS Statistics.

Results. During study was observed that ibuprofen in dose of 400 mg was bought statistically more frequently than lover dose ibuprofen (p = 0.001). This tendency was maintained regardless of the size of the package, respectively, 98.4 % vs. 1.6 % (for package with 10 tablets) and 91.2 % vs. 8.8 % (for package with 100 tablets). In 11 % cases 2 ibuprofen containing medication at once were purchased. And in 6 cases when two ibuprofen containing medications were bought together with paracetamol, the mean dose of paracetamol was higher compare with situations when only one ibuprofen with paracetamol were purchased, respectively 893.3 ± 686.5 mg vs. 543.4 ± 271.2 mg (p = 0.043). In more than half cases (68 %) ibuprofen was bought together with paracetamol or another NSAID. The most purchased from NSAIDs was acetylsalicylic acid (15 cases) with dosage ≥ 325 mg. In total 16 % of all cases ibuprofen was purchased with 2 other NSAIDs. Other mostly observed concomitantly used drugs with potential interaction risk with ibuprofen were beta-adrenoblockers (11 %), thiazide diuretics (7 %) and angiotensin converting enzyme inhibitors (6 %).

Conclusion. Collected data showed that more frequently ibuprofen was taken in combinations with other painkillers (68 %) or cardiovascular drugs (24 %) causing potential risk for decrease in drug efficacy or increase of side effects.
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