



# RSU INTERNATIONAL STUDENT CONFERENCE 2019



# Abstract Book

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HEALTH SCIENCES





RĪGA STRADIŅŠ UNIVERSITY  
INTERNATIONAL STUDENT CONFERENCE  
HEALTH AND SOCIAL SCIENCES

# ABSTRACT BOOK

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## Health Sciences

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## PREFACE

### **Dear students,**

It is my great honour 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.

Year 2019 is dedicated to research at Rīga Stradiņš University. From 1 to 5 April Rīga Stradiņš University will host the most significant scientific event to date – Research Week 2019. Among other events, this week will feature the International Student Conference "Health and Social Sciences". RSU Research Week will gather more than 50 visiting professors representing 20 countries. The programme will include 1250 presentations with an 80% increase compared to last year. We are proud that RSU Student Conference has grown significantly within the past few years – this year it will gather participants from 12 countries, the number of approved abstracts has reached 435, among them 80 abstracts in social sciences. This is a record-breaking number. In addition, 14 international jury members will participate in the conference, and it will feature 3 keynote speakers. It testifies to outstanding research capabilities of RSU students.

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,**

As every year, we welcome you to Rīga Stradiņš University in order to celebrate the biggest scientific event altogether for the next two days. The conference is one of the most awaited (and for me the most awaited) events for our university during the year. Challenges, generating ideas, success – with these words I would like to describe the Student Conference. Participating not only gives other like-minded students the chance to present their research, but also gain new insights from colleagues and faculty, network and meet colleagues from other countries, as well as create new ideas for future research.

This year for the first time the Student Conference is organized within RSU Research Week, during which 3 conferences will take place – Knowledge for use in practice, Places and International Student Conference "Health and Social Sciences". We are proud and appreciate that we, as students, have the opportunity to participate in the organising process of such a grand week!

We, the organizing committee, wish you conference days filled with insight and knowledge! We wish for you to spend these days in the right place at the right time! We wish that the "take home message" inspires you and encourages you in future life challenges to be able to reach new heights!

**Ulrika Ulla Andersone**  
Chair of the Organising Committee

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## INTERNAL MEDICINE: CARDIOLOGY, PULMONOLOGY

### CHANGES IN ECG FOLLOWING THE IMPLANTATION OF PACEMAKER

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**Keywords.** Cardiac pacemaker, atrial pacing, ventricular pacing, ECG.

**Objectives.** In the past few decades, the medical field has established the advantages and utility of cardiac pacing by electronic pacemakers for the treatment and management of conditions such as arrhythmias and conduction disorders. The implantation of pacemakers has increased the quality of life for many patients. Despite the advantages, it is important to remember that these are implanted devices and cause deviation from the normal electrical functioning of the heart among other changes. The objective of the study "Changes in ECG following the implantation of Pacemaker" is to comparatively study the electrical activity of the heart before and after the implantation of a pacemaker, more precisely to note how the different pacemakers affect the electrical activity in the heart.

**Materials and methods.** We collected the ECGs of 30 patients both before and after the implantation of a pacemaker. The ECGs of each patient will then be compared based on specific parameters. Conclusions will be drawn from the result of the comparisons.

**Results.** Of the patients observed thus far, the most common change after the implantation of the pacemaker was Notching in the R wave, followed by left bundle branch block-like appearance of QRS complex, T wave inversion and the least noted change was right bundle branch block-like appearance of QRS complex. In the case of atrial pacing alone, these changes were not observed instead, reduction of P wave duration was seen.

**Conclusion.** Most patients happened to have ventricular pacing, very rarely atrial pacing alone was seen. In the case of ventricular pacing, the changes noted in the QRS complex is explained by the fact that the electrical impulses are conducted in pathways other than the natural His bundle and Purkinje fibre pathway.

## COMPARISON OF DIFFERENT PARAMETERS AS A POTENTIAL IMPROVEMENT FOR HATCH SCORE SCALE

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**Keywords.** Atrial fibrillation, metabolic syndrome, HATCH, improvement.

**Objectives.** Atrial fibrillation (AF) and metabolic syndrome (MetS) nowadays are endemic disease. The MetS is based on 5 criteries that are not directly included in already known risk scales such as the SCORE or the HATCH. Comparison of several ECG criteries in AF patients with or without MetS and MetS progression as general may give reason to improve HATCH scale, what could provide a more reliable prognosis for AF progression.

**Materials and methods.** In this prospective study we survey 82 patients from the Latvian Center of Cardiology who have been already diagnosed with atrial fibrillation (AF). Patients where selected randomized and with voluntary participation. As sources of literature other studies about the subject in the Pub Med database and in AF guidelines of European society of Cardiology published in 2016 were used.

**Results.** From 82 AF patients, MetS was found for 47 (57.3%) patients. 42 participants with paroxysmal AF (parox-AF) were analysed, of which sinus rhythm was not found in almost 70%. Research showed that from parox-AF patients, MetS were diagnosed in 23 (54.76%) patients. Median of QRS complex in parox-AF patients reached 89 ms, but in patients with parox-AF and MetS it increased till 98ms. Comparing all AF groups, it showed progressive dynamic of dyslipidemia- in paroxysmal AF group dyslipidemia was diagnosed in 46.34% patients, in persistent AF group - 47.37% and longstanding AF group showed 72.73%. Also, the presence of MetS has been increased by 23.3% from parox-AF till long-standing persistent AF.

**Conclusion.** The HATCH scale include criterias, such as hypertension, stroke, heart failure what can be affected by the MetS presence among AF patients. Improving the HATCH scale with MetS would provide greater benefit in the preventive phase of AF treatment, especially in GP practice.

## COMPARING THICKNESS OF INTERVENTRICULAR AND LEFT VENTRICULAR POSTERIOR WALLS WITH LEFT VENTRICULAR EJECTION FRACTION AND VENTRICULAR DIAMETERS: A PILOT STUDY

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**Keywords.** Echocardiography, metabolic syndrome, atrial fibrillation.

**Objectives.** Metabolic syndrome (MetS), a cluster of obesity, elevated blood pressure, dyslipidemia, insulin resistance and glucose intolerance, has a frequent occurrence and it's known that MetS patients have higher odds of developing cardiovascular disease comparing to healthy individuals. MetS is also associated with abnormal structural and dimensional cardiovascular features such as higher ventricular wall thickness. The changes can be clinically assessed by echocardiography. The aim of this study was to investigate the prevalence of MetS between patients with atrial fibrillation and compare echocardiography values and their correlations (IVSd, PWd with EDD, ESD, EF) between the patients with and without MetS.

**Materials and methods.** This pilot study includes 45 patients with atrial fibrillation. Patients were examined whilst being hospitalized in Pauls Stradiņš Clinical University hospital. The examination took time between November 1st 2018. till the end of December 2018. All participants provided written informed consent. Data were collected from medical records, interviews and physical examination.

**Results.** Mean age of patients was 69.8 years (SD = 11.3), 42 % were men. 56 % of patients had metabolic syndrome.

For MetS patients, average echocardiography values - IVSd - 10.5 (SD = 3.0), PWd - 9.7 (SD = 2.4), EDD - 49.8 (SD = 5.0), ESD - 33.0 (SD = 6.7) and EF-58.1 (SD = 6.4).

For non-MetS patients, average echocardiography values - IVSd - 10.4 SD = 1.7, PWd - 10.0 (SD = 1.6), EDD - 49.4 (SD = 5.8), ESD-33.4 (SD = 6.9) and EF - 57.3 (SD = 9.6)

Data were analyzed using binary logistic regression and in a visual data representation a linear relationship was found between some data but no statistically significant difference of values between the two groups.

**Conclusion.** In this pilot study, presence of metabolic syndrome does not pose a statistically significant difference between echocardiography values - IVSd, PWd, EDD, ESD, EF. Such results could indicate a need for a larger number of participants or a possible error in the measuring process of echocardiography.

## 1-YEAR FOLLOW-UP OUTCOMES AFTER TRUE BIFURCATION STENTING

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**Keywords.** Coronary bifurcation, outcome, percutaneous coronary intervention.

**Objectives.** Bifurcation percutaneous coronary intervention (PCI) is challenging and is associated with a lower rate of procedural success and a higher risk of complications. The optimal management of bifurcation lesions is a matter of considerable debate. The aim of this study was to evaluate long-term outcomes of patients who underwent PCI for bifurcation lesions involving main vessel (MV) and side branch with diameter more or equal 2.5 mm.

**Materials and methods.** A retrospective analysis of the ongoing Coronar Bifurcation Treatment registry run wafted 4 x, \$, x in Latvia Centre of Cardiology (PCI performed from 01.01.2017. to 31.12.2017.) and 1-year follow-up.

**Results.** Totally were screened 4138 PCI procedures performed in Latvia Center of Cardiology in year 2017. Patients with ST elevation myocardial infarction in last 24 hours were excluded. Data on 177 patients with true bifurcations were collected. 1-year follow-up was available for 154 patients (87%). Major Adverse Cardiac Events (MACE) occurred in 4 patients (2.6%): cardiac death in 3 (1.9%), myocardial infarction, excluding periprocedural, in 1 (0.6%). No cases of definite stent thrombosis were observed. Left ventricular ejection fraction  $\leq 50\%$  ( $p = 0.012$ ) and multivessel disease ( $p = 0.033$ ) were associated with increase in MACE. Target lesion revascularization (TLR) occurred in 2 patients (1.3%). Increase in TLR rate was associated with higher stent length in main vessel (mean 23mm vs 37mm,  $p = 0,037$ ). Target vessel revascularization (TVR) occurred in 5 patients (3.2%). Increase in TVR rate were associated with higher stent length in MV (mean 22mm vs 38mm,  $p = 0,007$ ) and higher lesion lengths in MV (mean 19mm vs 26mm,  $p = 0,043$ ).

**Conclusion.** 1-year follow-up complication rate in the treatment of true coronary bifurcation lesions was low. Left ventricular ejection fraction  $\leq 50\%$  and multivessel disease were associated with increase in MACE. Higher stent length in MV was associated with increase in TLR and TVR, but higher lesion lengths in MV only with increase in TVR. There were no proven cases of definite stent thrombosis.

## ANALYSIS OF ATRIAL FIBRILLATION RISK FACTORS: AGE, DIABETES MELLITUS, EJECTION FRACTION IN PATIENTS WITH CARDIOMIOPATHY

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**Keywords.** Atrial fibrillation, cardiomyopathy, risk factors.

**Objectives.** Atrial fibrillation (AF) is the most common sustained rhythm disorder of the heart. Worldwide, the estimated number of individuals with AFib in 2010 was 33.5 million, according to a 2013 study. This number grows every year because of the constant increase of patients with multiple risk factors. The fact that comorbid patients with cardiomyopathy starts to suffer from the atrial fibrillation is showing that it impairs the quality of life and increases the risk of fatal accident. The aim of the study is to find out the frequency and types of the atrial fibrillation and to identify the risk factors that could cause the arrhythmia in patients with cardiomyopathy.

**Materials and methods.** Retrospective study of 100 patients with cardiomyopathy admitted in Riga Eastern Clinical Hospital in 2018.

**Results.** In our scientific work was calculated that in 100 randomly chosen patients (A) with cardiomyopathy were 43 patients in age below the level of 65 years (B) and 57 patients over the level of 65 years (C): (A) 34% didn't have AF; 14% had paroxysmal AF; 11% had persistent; 41% had permanent AF; Diabetes mellitus 5%; Ejection fraction abnormalities 23% (B) 44.2% didn't have AF; 14% had paroxysmal AF; 14% had persistent; 27,9% had permanent AF; Diabetes mellitus 4.6%; Ejection fraction abnormalities 18,6% (C) 26.3% didn't have AF; 14% had paroxysmal AF; 8.8% had persistent; 50.9% had permanent AF; Diabetes mellitus 5.2%; Ejection fraction abnormalities 26.3%.

**Conclusion.** Our work revealed that 66% of 100 randomly chosen patients with cardiomyopathy suffers from atrial fibrillation. The incidence of the arrhythmia is rather high in the population of patients with cardiomyopathy. Most often met type of the atrial fibrillation is permanent. We have found out that relative incidence in population of patients with cardiomyopathy and ejection fraction abnormalities is higher in patients older than 65 years in comparison with population of the similar patients, but younger than 65 years old. The relative incidence of diabetes mellitus in the populations chosen is very close in both populations chosen.

## CORRELATION OF PHARMACOLOGICAL TREATMENT AND HEART FAILURE IN PATIENTS WITH ATRIAL FIBRILLATION

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**Keywords.** Heart failure, atrial fibrillation.

**Objectives.** Despite modern therapeutic innovations and prolongation of patient lives heart failure (HF) is on the rise around the world. Mortality rates from HF remains unacceptably high. Early and effective treatment for atrial fibrillation (AF) can reduce the incidence and clinical progression of HF and make pharmacological treatment more effective. Aim is to analyze HF symptoms regarding risks and treatment and comparing it to the latest guidelines.

**Materials and methods.** A prospective study including patients (n = 118) with HF and confirmed AF hospitalized in Pauls Stradiņš Clinical University hospital. We looked for coherence between the treatment and stage of HF according to NYHA and AHA classifications and the type of AF. As well as compared the individual treatments to the latest guidelines.

**Results.** Patients mean age: 66.7 years (SD ± 10.2), 49% were women. 83.7% patients had primary arterial hypertension, 20.7% diabetes mellitus, 16.3% had previous myocardial infarction. AF types: 63.3% paroxysmal, 31.2% persistent un 5.5% permanent. 73.4% of patients belonged in functional classes II-III by NYHA and 64.9% were in class C according to AHA objective assessment. 38.5% underwent electrocardioversion. Only 55.5% used antiarrhythmics, of which 46.7% received amiodarone, 35% ethacizine. 22.7% patients had prior antiarrhythmics therapy, but it had been changed by previous doctors e.g. general practitioners. 45.5% received ACE inhibitors, 58% perindopril. 66.4% used beta blockers of many kinds and doses, most used were: metoprolol 25-50mg (16.4%), betaxolol 20-40mg (11.9%), bisoprolol 2.5-7.5 (15.5%), sotalol 120-160mg (4.5%). 30.9% patients used diuretics. 85.3% used medication regularly.

**Conclusion.** Treatment for HF mostly was not sufficient as more than 80% of the patient displayed persistent symptoms of HF that were hardly changed by medical treatment. Only small amount of the patients received adequate pharmacological treatment for HF according to 2016 ESC guidelines and ironically one third of these patients were the ones that did not use the medication regularly.

## FRAGILE PATIENTS WITH ACUTE PULMONARY EMBOLISM

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**Keywords.** Pulmonary embolism, fragile patients, anticoagulation.

**Objectives.** Direct oral anticoagulant (DOAC) use shows lower bleeding risk in the fragile patient subgroup (Prins et.al., 2013). The objective – to compare clinical characteristics, treatment, venous thromboembolism (VTE) recurrences and major bleeding during the first 3 months of anticoagulation in fragile versus non-fragile patients with APE.

**Materials and methods.** The prospective cohort study included 360 consecutive patients from 01.06.2014 to 31.10.2018 with symptomatic APE. Follow-up was done at 90 days after admission. Fragility was defined as one or more of the criteria: age  $\geq 75$ , creatinine clearance  $\leq 50$  mL/min, weight  $\leq 50$  kg. Variables were compared using the Chi-square test; Cox proportional-hazards model – for VTE recurrences and major bleeding in follow-up.

**Results.** Of all patients, 173 (48%) were considered fragile. They were more likely to be female (OR = 1.558; 95%CI: 1.216 – 1.996;  $p < 0.001$ ), to have chronic heart failure (OR = 1.584; 95%CI: 1.302 – 1.928;  $p < 0.001$ ), or anaemia (OR = 1.323; 95%CI: 1.143-1.532;  $p < 0.001$ ). Fragile patients more often received initial therapy with low molecular weight heparins (LMWH) (52% vs 29%;  $p < 0.05$ ), less often with DOACs (34% vs 57%;  $p < 0.05$ ). In long-term therapy higher percentage of patients received LMWH (12% vs 3%;  $p < 0.01$ ), warfarin (25% vs 23%;  $p < 0.01$ ), lower percentage – DOACs (63% vs 74%;  $p < 0.01$ ). Fragile patients had higher all-cause mortality (17.8% vs 7.3%; OR = 2.75; 95%CI: 1.41-5.34). During the follow-up, 2.2% ( $n = 8$ ) patients had VTE recurrences, 4.4% ( $n = 16$ ) major bleeding episodes. No significant differences between sequelae and fragility were found. Independent risk factor for 90-day major bleeding: thrombocytopenia ( $p < 0.05$ ; HR = 4.577; 95%CI: 1.383-15.147). Independent risk factor for VTE recurrences: thrombocytopenia ( $p < 0.05$ ; HR = 55.129; 95% CI: 1.063-2858.381).

**Conclusion.** Fragility affects the choice of anticoagulation therapy. Fragility seems to have no effect on risk of major bleeding or VTE recurrences during the 90-day period, but abnormal platelet counts increased risk significantly.

## CORRELATION OF TRANSESOPHAGEAL ECHOCARDIOGRAPHY FINDING WITH D-DIMERE LEVEL IN PATIENTS WITH ATRIAL FIBRILLATION, BEFORE CARIOVERSION

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**Keywords.** D-dimere, transesophageal echo, atrial fibrillation, echo contrast cardioversion.

**Objectives.** Transesophageal echocardiography (TEEHO) is widely used test to evaluate cardiac sources of thromboembolism and is established as a gold standard to exclude left atrial thrombi. D-dimer is a soluble fibrin degradation product and is an established blood test that reflects activation of the coagulation system. D-dimere is well evaluated in patients with deep venous thrombosis. Elevated D-dimere levels have been described in patients with atrial fibrillation, with left atrial thrombus and/or spontaneous echo contrast. However, there is lack of information to use D-dimere in clinical setting as a negative predictive value for left atrial thrombus. The aim of this study is to determine if D-dimere assay could be used as a negative predictive test for intracardiac thrombotic activity.

**Materials and methods.** This retrospective observational, single-center study comprised 81 patients with atrial fibrillation or atrial flutter, before cardioversion, who were tested for D-dimere levels and had TEEHO performed.

**Results.** We analysed 81 patients. Mean patient age was 63.47. ( $\pm$  10.66) from which 35.8% (n = 29) were women. Patients who had negative TEEHO finding for thrombus or echo contrast 86.5% (n = 45) had D-dimeres below 0.5 mg/LFEU, but above 0.5 mg/L FEU 13.5% (n = 7). 40% (n = 4). In intense echo contrast group, above D-dimere cut-off value was 60% (n = 6) of patients, but below D-dimere cut-off value was 40% (n = 4) (p = 0.01).

**Conclusion.** This study shows that, there is a statistically significant correlation between D-dimere test results and TEEHO findings of intracardial thrombus. However, patients with intense spontaneous echo contrast, and D-dimere, below 0.5 mg/FEU comprised 40% of intense echo contrast group. This finding indicates, that in this patient group, thrombotic process in left atrium cannot be excluded.

## INFECTIVE ENDOCARDITIS SURGERY: OUTCOMES AND PREDICTORS OF EARLY MORTALITY – A SINGLE CENTRE EXPERIENCE

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**Keywords.** Infective endocarditis, cardiac surgery, 30-day inhospital mortality.

**Objectives.** Surgical management of infective endocarditis (IE) continues to be challenging and is associated with significant morbidity and mortality. The study aim was to review our early results of IE surgical treatment and to estimate the impact of demographic, clinical, echocardiographic and intraoperative parameters on 30-day inhospital mortality of IE patients after surgical treatment.

**Materials and methods.** 124 patients, who underwent surgery for IE at the Hospital of Lithuanian University of Health Sciences from January 2010 through December 2016, were retrospectively studied. We reviewed data including case history information, echocardiography and surgery protocols. The primary endpoint was overall mortality at 30 days. Secondary endpoints were early postoperative outcomes and complication rates. Demographics and perioperative clinical characteristic of patients who survived 30 days after surgery were compared with those of non-survivors to identify factors predictive of 30-day mortality.

**Results.** During the study period, 124 patients with IE underwent cardiac surgery, presenting an overall 30-day inhospital mortality rate of 10.48%. Mean age was  $58 \pm 14.4$  years with 95 (76.61%) males. Independent predictive factors of early mortality were age  $> 63$  years ( $p = 0.003$ ) and body mass index (BMI)  $> 30$  kg/m<sup>2</sup> ( $p = 0.003$ ), as well as intraoperative parameters - prolonged aortic cross-clamping time (XCT)  $> 84.5$  min ( $p = 0.027$ ) and cardiopulmonary bypass duration (CPB)  $> 107.5$  min ( $p = 0.023$ ). *S. aureus* infection ( $p = 0.012$ ), IE-related intracardiac complication such as perivalvular abscess detected by transesophageal echocardiography ( $p = 0.011$ ) and IE complicated by sepsis or septic shock ( $p = 0.001$ ) were statistically significant factors for increased risk of 30-day inhospital mortality.

**Conclusion.** The most important predictors of 30-day inhospital mortality for patients who underwent cardiac surgery for infective endocarditis were age, body mass index, prolonged aortic cross-clamping and cardiopulmonary bypass time, *S. aureus* infection and paravalvular abscess.

## IMPACT OF PATIENT AND STENT CHARACTERISTICS ON IN-STENT RESTENOSIS

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**Keywords.** Hypertriglyceridemia, in-stent restenosis, PCI.

**Objectives.** In-stent restenosis (ISR) is a problem faced by interventional cardiologists. Drug-eluting stents (DES) have reduced the incidence of ISR compared to bare-metal stents (BMS), however the prevalence of ISR still remains noteworthy. A study was conducted to determine different characteristics affecting development of ISR.

**Materials and methods.** Out of 4538 patients undergoing percutaneous coronary intervention (PCI) at Pauls Stradins Clinical University Hospital, 66 patients with newly diagnosed ISR were included in a single center retrospective cohort study from January 1, 2018 till December 31, 2018. Patients were divided in subgroups depending on the affected stent (DES or BMS) and the occurrence of solitary or multiple ISR. Collected data was analyzed using SPSS.

**Results.** Out of 66 enrolled patients with a mean age of  $67 \pm 9$  years, 54 (81.8%) were male, 3 (4.5%) patients had ISR in the LM artery, 30 (45.5%) – in LAD, 25 (37.9%) – in RCA and 8 (12.1%) – in LCX. In 43 (65.2%) cases drug eluting balloon was used to treat ISR, 7 (10.6%) patients underwent repeat stenting with DES, 7 (10.6%) – balloon angioplasty, 9 (13.6%) – only cutting balloon intervention. 47 (74.6%) patients had ISR in DES, 16 (25.4%) in BMS. Patients with an ISR in DES tended to be younger ( $65,72 \pm 9,22$  years in DES vs  $71,38 \pm 6,8$  in BMS;  $p = 0,01$ ) and time from implantation-to-ISR was shorter (709 vs 3432 days;  $p = 0,02$ ). 30 (45.5%) patients had single ISR and 36 (54.5%) had multiple ISR. Patients with multiple ISR were more often male ( $p = 0.024$ ), had prevalent hypertriglyceridemia ( $p = 0.047$ ) and a history of previous smoking ( $p = 0.044$ ). Multiple ISR had an association with longer time from implantation to ISR time ( $p = 0.003$ ).

**Conclusion.** Hypertriglyceridemia and time till ISR had an impact on the occurrence of multiple ISR. Younger age and shorter implantation-to-ISR time was found in the DES subgroup.

## LEFT ATRIAL DIMENSION AND LEFT ATRIAL FUNCTION INDEX COMPARISON WITH LEFT VENTRICULAR SYSTOLIC AND DIASTOLIC DIAMETERS: A PILOT STUDY

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**Keywords.** Metabolic syndrome, atrial fibrillation, echocardiography.

**Objectives.** Atrial fibrillation (AF) is the most frequently encountered arrhythmia in clinical practice (Schmidt et al., 2011). Metabolic syndrome (MetS) is associated with an increased risk of development of AF (Chamberlain et al., 2010). Transthoracic echocardiography should be performed for all patients with AF, in order to acquire information about size and function of left atrium (LA, LAVI) and left ventricle (ESD, EDD, EF). Aim was to investigate and compare echocardiography values (LA, LAVI, ESD, EDD, EF) between atrial fibrillation patients with and without metabolic syndrome.

**Materials and methods.** A pilot study was designed during November and December 2018. 45 patients with AF participated in the survey that took place in Pauls Stradiņš Clinical University Hospital Latvian Centre of Cardiology. Statistical data was analyzed with SPSS v.23.

**Results.** Out of 45 patients 58% were women and 42% were men. Mean age of the patients was 69.8 years (SD 11,3). The participants were divided into two groups: patients with MetS - 56% and patients without MetS 44%. For MetS patients, the average echocardiographic values were - LA-44.7 (SD 5.6), LAVI-39.9 (SD 11.0), EDD - 49.8 (SD 5.0), ESD - 33.0 (SD 6.7) and EF - 58.1 (SD 6.4). For non-MetS patients, the average echocardiographic values were - LA - 42.9 (SD 6.0), LAVI - 34.4 (SD 10.0), EDD - 49.4 (SD 5.8), ESD - 33.4 (SD 6.9) and EF - 57.3 (SD 9.6). A simple linear regression between some variables was found in a visual data representation. However, there was no statistically significant difference of echocardiographic values between patients with MetS and without MetS.

**Conclusion.** This pilot study shown no significant correlation between presence of metabolic syndrome and echocardiographic values (LA, LAVI, ESD, EDD, EF). In order to plan the prospective cohort study the higher number of participants is needed.

## IS THERE ANY DIFFERENCE BETWEEN AGE GROUPS AND ANTICOAGULANTS USAGE?

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**Keywords.** Atrial fibrillation, anticoagulants.

**Objectives.** Atrial fibrillation (AFib) - arrhythmia type that can increase cardiovascular complication risk. Patients are recommended to use anticoagulants (AC) - non-vitamin K antagonist oral anticoagulants (NOACs) or vitamin K antagonist (warfarin).

Aim was to Evaluate the anticoagulant usage in patients of 3 age groups: < 65 years (yrs), 65-75 yrs old and > 75 yrs.

**Materials and methods.** The study was held from October 2016-January 2019. High-risk AFib non-valvular patients were surveyed in 6- and 12-months period. Data were analyzed with SPSS: descriptive methods (Chi-square test).

**Results.** A total of 377 patients, 56.5% (n = 213) women, 43.5% (n = 164) men, mean age 71.1 yrs were enrolled in the research. After 6 months a total of 137 patients, after 12 months a total of 73 patients. At start there was a statistically significant difference between age groups and anticoagulant usage (p = 0.003;95%CI): age group < 65 yrs 23.1% (n = 18) did not use AC, 26.9% (n = 21) used warfarin, used NOACs-50% (n = 39), age group 65-75yrs: 28.1% (n = 39) did not use AC, 38.8%(n = 54) used warfarin, used NOACs - 33.1% (n = 46), age group > 75 yrs: 40.6% (n = 65) did not use AC, 30.6% (n = 49) used warfarin, used NOACs-28.7% (n = 46). After 6-month follow-up in all age groups were increase of warfarin users (< 65 yrs: 40% (n = 10), 65 - 75 yrs: 40.4% (n = 21), > 75 yrs: 35.6% (n = 21)) and decrease of patients who did not use AC (65 yrs:8.0% (n = 2), 65-75 yrs: 7.7% (n = 4), > 75 yrs: 25.4% (n = 15)). After 12-month follow-up there was a decrease in patients who did not use AC in > 75 yrs group.

**Conclusion.** The > 75yrs group have statistically significantly more patients who did not use AC and fewer patients who used NOACs compared to 65-75yrs and < 65yrs groups. After a 6 month follow-up in all age groups was an increase of warfarin user proportion and a decrease of the patient proportion who did not use AC.

## SHORT-TERM ORAL ANTICOAGULANT-ASSOCIATED ADVERSE EVENTS IN PATIENTS WITH HIGH-RISK ATRIAL FIBRILLATION AFTER ELECTRICAL CARIOVERSION

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**Keywords.** Atrial fibrillation (AF), electrical cardioversion (ECV), oral anticoagulants (OACs).

**Objectives.** High-risk AF patients after ECV should continue OAC intake indefinitely to prevent thromboembolic events. It highlights the need for awareness of possible adverse outcomes. Study was to evaluate OAC - associated adverse events in high - risk AF patients after ECV in short term (30 days).

**Materials and methods.** This prospective study was conducted among high-risk AF patients undergoing ECV in Pauls Stradiņš Clinical University Hospital from October 2018 till December 2018. Criteria defining high-risk patients were CHA<sub>2</sub>DS<sub>2</sub>-VASc score 2 or greater in men and 3 or greater in women. Adequate anticoagulation prior to ECV was inclusion criterion as well. After signing informed consent, patients were interviewed according to questionnaire to obtain data for demographics, medication intake and medical history. Thromboembolic events, coronary events, bleeding (major, clinically relevant non-major (CRNMB) and minor, according to ISTH criteria) were the OAC-associated adverse events evaluated. Follow-up interview was conducted after 30 days. For data analysis Microsoft Excel software was used.

**Results.** 52 participants (28 men and 24 women) were included.

Mean CHA<sub>2</sub>DS<sub>2</sub>-VASc score was 3.6 among all, 2.9 among men and 4.4 among women. All patients were adherent to OAC therapy. 36 (69.2%) patients were taking rivaroxaban, 8 (15.4%) - dabigatran and 8 (15.4%) - warfarin. 5 (9.6%) patients reported OAC-associated adverse events. Thromboembolic event (ischaemic cardioembolic stroke within first 24 hours after ECV) occurred in 1 (1.9%) patient (dabigatran user). No patients reported coronary or major bleeding events. CRNMB occurred in 1 (1.9%) patient (warfarin user) - gastrointestinal bleeding requiring face-to-face medical consultation and OAC change. 3 (5.8%) patients (rivaroxaban users) reported minor bleeding (epistaxis, excessive bleeding from minor wound and hematuria).

**Conclusion.** OAC therapy is overall well tolerated in short term among patients with high-risk AF after ECV, as the rate of reported OAC-associated adverse events was low and minor bleeding events prevailed.

## LOW RELATIVE LYMPHOCYTES COUNT ASSOCIATED WITH HIGHER MORTALITY IN PATIENT WITH CARDIOMYOPATHY

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**Keywords.** Relative lymphocytopenia, cardiomyopathy.

**Objectives.** A reduction in the relative lymphocyte count is a marker of the stress response. The objective of this study was to investigate the predictive value of the relative lymphocyte count for mortality in patients with cardiomyopathy.

**Materials and methods.** A retrospective study was conducted in Riga East Clinical University Hospital during year 2018. We analyzed 97 full blood tests of hospitalized patients with diagnosis "Cardiomyopathy". All patients were divided into two groups: died in hospital and discharged. All collected data analyzed using SPSS and considered statistically significant with "p < 0.05".

**Results.** Total number of patients included in the study was 97, the mean age of patients was  $67.69 \pm 12.5$ . Our study revealed that in 55.7% (n = 54) of all cases decreased relative lymphocytes count was found (the average lymphocytes percent was 12). All patients were divided into two groups: first group - died in hospital 20.6% (n = 20), second group discharged 79.3% (n = 77). In first group - the average lymphocytes percent was 8,6 (normal level - 19.0-37.0%) and in second one - 19.8. Using Mann-Whitney test  $U = 266$ ,  $n_1 = 20$ ,  $n_2 = 77$ , was found a statistically significant difference between the groups ( $p = 0,001$ ). There is statistically significant correlation between relative lymphocytopenia level in patients who died, and people group who discharged.

**Conclusion.** A low relative lymphocyte count can be used as predictor of poor prognosis in patients with cardiomyopathy. The relative lymphocyte count is a simple and inexpensive marker which can help to identify patients with cardiomyopathy with increased risk for mortality. Obviously, lower relative lymphocyte count associates with higher mortality in patients with cardiomyopathy. Pathophysiologic mechanisms of lymphopenia still unknown.

## MORTALITY AFTER ACUTE PULMONARY EMBOLISM IN PATIENTS WITH DIABETES MELLITUS

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**Keywords.** Anticoagulant therapy, mortality, pulmonary embolism, diabetes.

**Objectives.** Little information of diabetes mellitus (DM) impact on anticoagulant therapy in patients with venous thromboembolism (VTE) has been reported. However, the outcome after acute pulmonary embolism (PE) in patients with DM remains contentious (Miguel-Díez et al., 2019). Aim was to assess the implication of DM on mortality after acute PE.

**Materials and methods.** The prospective cohort study was conducted to analyze 372 consecutive patients with symptomatic acute PE in a single university hospital from 2014 till 2018. Patient prognosis was analyzed according to low-molecular weight heparin (LMWH), direct oral anticoagulant (DOAC) and vitamin K antagonist therapy (VKA). All data were analyzed by IBM SPSS 23.0.

**Results.** Mean age was  $67 \pm 15$  years. Study population was predominantly females, 59.7% (n = 222). DM was seen in 18.3% (n = 68) patients (females: 64.7%, n = 44),  $p > 0.05$ . Long-term anticoagulation therapy in patients with versus without DM was: LMWH - 14.0% (n = 8) versus 6.3% (n = 16); DOAC - 57.9% (n = 33) versus 65.6% (n = 168); VKA - 22.8% (n = 13) versus 25.4% (n = 65), respectively;  $p > 0.05$ . In Cox regression, comorbidities that were independent significant prognostic factors for death were cancer (hazard ratio (HR) 9.199 [95% confidence interval (CI) 5.156-16.412],  $p = 0.001$ ), peripheral artery disease (PAD) (HR 2.398 [95% CI 1.161-4.955],  $p = 0.018$ ), and atrial fibrillation (AF) (HR 2.515 (95% CI 1.435-4.407),  $p = 0.001$ ). Patients with DM showed higher mortality (28.3%) than patients without DM (19.7%), without reaching statistical significance,  $p > 0.05$ .

**Conclusion.** Cancer, PAD and AF was associated with an increased risk for death after acute PE dissimilarly to DM. DM did not influence the selection of anticoagulation therapy.

## VALIDATION OF A TOOL FOR PATIENTS' REPORTING OF THE VILLALTA SCALE

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**Keywords.** Deep vein thrombosis, long-term complication, patient-reported outcome, post-thrombotic syndrome, villalta scale.

**Objectives.** Post-thrombotic syndrome (PTS) is a long-term complication of deep vein thrombosis (DVT), affecting about 50% of DVT patients. The Villalta scale is the recommended tool for diagnosing PTS. The tool comprises 5 symptoms to be scored by patients and 6 clinical signs plus venous ulcer assessed by healthcare personnel. We previously developed a tool for patients' reporting of the Villalta scale (PRV), which showed very good agreement with the original Villalta scale (kappa 0.81). The present study aimed to validate the PRV in a new cohort of patients and evaluate the agreement between individual clinical signs in the PRV as compared to the original Villalta scale.

**Materials and methods.** One hundred and sixty-nine patients diagnosed with DVT between 2011 and 2014 were recruited from three Norwegian centers 24 ( $\pm$  6) months after DVT. Patients completed the PRV before a scheduled visit. PTS diagnosed by the original Villalta scale served as the reference method. PTS was diagnosed if Villalta score was  $> 4$  points. Interobserver agreement was measured using kappa coefficient, weighted kappa coefficient and 95% CI.

**Results.** Sixty-nine (40.8%) patients were diagnosed with PTS using the original Villalta scale compared to 77 (45.6%) using PRV. The PRV showed good agreement with the original Villalta scale in diagnosing PTS (kappa agreement 0.78, 95% CI 0.69-0.88). The sensitivity and specificity was 93% (95% CI 87-99) and 87% (95% CI 80-94), respectively. Regarding individual items, good agreement between the scales was found in "pain on compression" and "hyperpigmentation" (weighted kappa 0.76; 95% CI 0.67-0.85 and weighted kappa 0.73; 95% CI 0.63-0.84, respectively). Good to fair agreement was found in assessment of the remaining clinical signs.

**Conclusion.** Validation of the PRV confirmed the tool as a valid and sensitive tool for diagnosing PTS.

## THE IMPACT OF ANTICOAGULANT THERAPY DURATION ON OUTCOMES IN PATIENTS WITH VENOUS THROMBOEMBOLISM

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**Keywords.** Anticoagulants, pulmonary embolism, outcomes.

**Objectives.** Venous thromboembolism (VTE) is an important worldwide cause of morbidity and mortality that includes deep vein thrombosis (DVT) and/or pulmonary embolism (PE) (Beckman et al., 2009). Anticoagulant therapy is used to prevent VTE recurrences (Russell D Hull et al., 2018). Aim was to investigate the clinical outcome of acute PE patients - recurrent PE/DVT or death - in association with duration of anticoagulant therapy.

**Materials and methods.** The study included 171 cases of hospitalized patients with DVT/PE in Pauls Stradiņš Clinical University Hospital. Patients were divided into 3 groups according to duration of anticoagulation therapy: less than 3 months, 3 to 6 months and longer than 6 months. All patients were followed up for one year. Data was analyzed and calculated using IBM SPSS 23.0.

**Results.** Mean age of patients was 69.7 (SD 11), 62% were female (n = 106). In patients who survived for at least 6 months after VTE, there was no statistically significant difference between anticoagulant therapy duration and mortality or recurrence in 1 year (p > 0.05). Overall, no statistically significant difference was found between classes of anticoagulant drugs and mortality in 1 year (p > 0.05). Among patients who discontinued anticoagulant therapy during 1-year follow-up, mortality was 43.8% (n = 7) in group that received anticoagulant therapy less than 3 months, 37.5% (n = 6) - 3 to 6 months, 18.8% (n = 3) - longer than 6 months (p = 0.004). There was no association (p > 0.05) between transient risk factors (e.g. operation, pregnancy, immobility), anticoagulation duration and mortality. Presence of active cancer was associated with higher mortality (OR = 19, C.I = 4.4-81.9, p < 0.001).

**Conclusion.** This study demonstrated association between the duration of anticoagulation and mortality rate after discontinuation of treatment. Patients with active cancer had higher mortality.

## CARDIOVASCULAR RISK FACTORS IN EVALUATION OF LOW RISK PATIENTS WITH PERFORMED MYOCARDIAL PERFUSION SCINTIGRAPHY

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**Keywords.** Myocardial perfusion scintigraphy; cardiovascular risk factors.

**Objectives.** Myocardial Perfusion Scintigraphy (MPS) provides prognostic information beyond traditional cardiovascular risk factors (RF). Accordingly the risk stratification of individual MPS guide decision making with respect to medical vs invasive treatment. The aim was to power the role of baseline RF profile by relation with perfusion defects for assessment of the need and intensity of therapeutical intervention in patients with low ischemic risk.

**Materials and methods.** Retrospective study of 408 patients with MPS, held at Pauls Stradins Clinical University Hospital in 2015. Three groups of patients: summed difference score (SDS)-0 (no inducible ischemia), SDS 1-4 and SDS > 4. Ischemic risk defined by SDS: 0-4 - low, 5-8 - intermediate, 9-12 - high, > 12 - very high risk. Cardiovascular RF were evaluated.

P value < 0.05 regarded as statistically significant.

**Results.** SDS of 0 points observed in 42.3% in the no arterial hypertension (AH) group, in 30.6% within AH group. SDS 1-4 - in 44.2% and 51.6%, SDS > 4 points - in 13.5% and 17.8%, accordingly (p = 0.035). Between genders: SDS of 0 points in 44.1% of females vs 25.5% in males, SDS 1-4 - in 44.6% and 53.7%, SDS > 4 - in 11.3% and 20.8%, accordingly (p < 0.05). The highest prevalence of adiposity patients with SDS 1-4 (52.6%) and highest prevalence of no adiposity patients with SDS of 0 points (46.0%) (p = 0.003).

The correlation observed between SDS and several RF in males, in females - between AH degree and SDS (p = 0.043, r = 0.181).

**Conclusions.** 1) The variability within low-risk group and difference with groups at higher ischemic risk accordingly analysis of cardiovascular RF; 2) Assessment of cardiovascular RF is the important basis for decision making of subsequent diagnostics and management along with SDS in patients with low ischemic risk.

# INTERNAL MEDICINE: GASTROENTEROLOGY, ENDOCRINOLOGY, NEPHROLOGY, HAEMATOLOGY, RHEUMATOLOGY, GERIATRICS

## EVALUATION OF DONOR RISK INDEX AND GRAFT SURVIVAL IN KIDNEY TRANSPLANT RECIPIENTS IN LATVIA

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**Keywords.** Kidney transplantation, kidney donor risk index (KDRI), kidney donor profile index (KDPI).

**Objectives.** The Kidney Donor Risk Index (KDRI) combines 10 donor factors to summarize the risk of graft failure after kidney transplant from deceased donor into a single number. The KDPI is a remapping of the KDRI onto a cumulative percentage scale. These risk scales are currently widely used in the U.S.

To analyze how KDRI/KDPI score affects clinical outcomes for graft recipients.

**Materials and methods.** The study included 135 Kidney transplant recipients (KTRs) from 95 deceased donors in Latvian Transplant center during the time period January 2013 – November 2016. KTRs were divided into 2 groups based on median KDPI (60%) and clinical outcomes of high (> 60%) and low KDPI (< 60%) were compared. KTR follow-up time was 2-3 years after transplantation. KDRI/KDPI scores were calculated using online calculator available on OPTN website. GFR was calculated by MDRD formula.

**Results.** Delayed graft function was more common in high KDPI group (Chi-square,  $p = 0,02$ ), also complications during first post-transplant year occurred more often in high KDPI group (Chi-square,  $p = 0,003$ ). Median GFR was significantly lower in high KDPI group in all three of the follow-up years compared to low KDPI group (Mann-Whitney U,  $p < 0,01$ ).

Kaplan–Meier analysis showed that even though 12-month graft survival strived for higher score in low KDPI group – 98,5% (95%CI 95,6-100) than high KDPI group 94,1% (95%CI 88,5-99,7%) the difference was not statistically significant (Log-Rank,  $P = 0,37$ ).

**Conclusion.** KTRs receiving grafts with KDPI > 60% are more likely to develop complications during first year after transplantation and also to have weaker overall graft function (low GFR) compared to KTRs receiving grafts of KDPI < 60%.

## THE IMPACT OF HEMODIALYSIS ON PATIENTS QUALITY OF LIFE

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**Keywords.** Hemodialysis, quality of life, CKD.

**Objectives.** In Europe the number of patients undergoing hemodialysis (HD) has been rapidly growing, thus in 2017, 358000 people were on dialysis from whom 55% received hemodialysis. In 2017, 384 people (36% of Chronic kidney disease (CKD) patients) in Latvia received this treatment. In recent years, there has been a growing interest in understanding the health-related quality of life (HRQoL) of patients with end-stage chronic kidney disease (Nga et al. 2018). The aim of this research is to evaluate hemodialysis impact on patients physical and social activities.

**Materials and methods.** In our prospective study we enrolled patients who receives hemodialysis therapy due to end-stage CKD. A questionnaire was created by authors to assess patients QoL. Descriptive and analytical statistics were performed on SPSS, level of statistical significance was set at  $p < 0.05$ .

**Results.** The study group comprised 52 patients at the mean age of 58.92 years (95% CI 54.9-63.1). The gender distribution was: male 57.7% [44.2-71.2] versus females 42.3% (28.8-55.8). The median of HD duration was: 3.0 (2.71-6.0) years. Most common access for HD was through arteriovenous fistula 71.2% (57.7-82.7). 37.3% (25.5-50.9) evaluated their state of health as "very unsatisfied" or "unsatisfied". A significant relationship was found between HD duration and ability to work [ $p = 0.001$ ], influence on patients sleep quality ( $p = 0.031$ ), and patients ability to take self-care ( $p = 0.025$ ), but has no significant effect to patients feeling depressed.

**Conclusion.** There have been found associations with decreasing QoL and duration of HD. There are no proof that HD patients age has any impact on their QoL.

## QUALITY OF LIFE IN FIRST-TIME RHEUMATIC PATIENTS IN LATVIA

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**Keywords.** Quality of life, EQ-5D-5L, rheumatic diseases.

**Objectives.** Rheumatic diseases (RD) are debilitating and progressive by their nature, therefore, they influence different areas of a patient's life. Due to the significant increase in RD worldwide, it is essential to assess the impact of these disorders on health related quality of life (HRQoL). The aim of the study was to analyze the impact of RD on the quality of life (QoL) of the first-time rheumatic patients.

**Materials and methods.** Patients who presented to a rheumatologist as out-patients for the first time in their lives were asked to complete the standardized EuroQol questionnaire EQ-5D-5L and to answer questions related to their medical history and sociodemographic characteristics. Descriptive statistics and nonparametric tests were used to determine the possible differences in HRQoL by gender, education and clinical diagnosis.

**Results.** 45 out-patients completed the questionnaires. The mean age was 56.4 (SD 10.8) years. Out of five EQ-5D-5L items "pain/discomfort" section received the lowest ratings: 13.3% reported having severe pain or discomfort, 4.4% reported having extreme pain or discomfort. The mean EQ VAS value was 56.2 (SD 17.6) for all patients. Based on EQ VAS values, 51.1% evaluated their overall health as poor. The median HRQoL value was 0.683 (IQR 0.520-0.802), osteoarthritis (OA) group had the lowest HRQoL - 0.619 (IQR 0.433-0.788), both values represent poor HRQoL assessment. However, no statistically significant relationships were found in HRQoL value by gender ( $p = 0.606$ ), education ( $p = 0.351$ ) and clinical diagnosis ( $p = 0.462$ ).

**Conclusion.** RD are associated with impaired QoL. Patients with OA and systemic inflammatory rheumatic diseases have similar HRQoL impairment. In other words, the QoL live is not contingent on aetiology.

## MALNUTRITION RISK EVALUATION IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE

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**Keywords.** Inflammatory bowel disease, nutritional risk score, malnutrition universal screening tool.

**Objectives.** Patients with inflammatory bowel disease (IBD) have increased risk for malnutrition, it may be due to increased activity of disease, inadequate nutrition and malabsorption. Aim was to evaluate necessity for nutritional support in patients with IBD by using Nutritional Risk Score (NRS2002) and Malnutrition Universal Screening Tool (MUST) and to assess correspondence between two screening tools.

**Materials and methods.** This prospective pilot study was carried out from September 2018 till January 2019. Patient's  $\geq 18$  years with established diagnosis IBD were screened using NRS2002 and MUST, for 31 patients bioelectrical impedance analysis (BIA) were done.

**Results.** We assessed 33 patients, 15 (42.4%) female and 19 (57.6%) male, 17 (51.5%) ulcerative colitis (UC) and 16 (48.5%) Crohn's disease (CD) patients. Hospitalised were 15 patients. Average Crohn's disease activity index (CDAI) 158 and Mayo score 4.5. According to NRS2002 11 (33%) patients were nutritionally at-risk and in need of nutritional support (score  $\geq 3$ ), additional 7 (22%) required observation, without necessity for additional nutritional care (score  $\leq 2$ ). By MUST score 16 (48%) patients had a high risk of malnutrition with needed nutritional care plan (score  $\geq 2$ ) and 4 (12%) required observation (score  $\leq 1$ ). 12 patients received enteral feeding, 5 had parenteral feeding. With low disease activity index MUST score  $\geq 2$  in 6 patients, higher risk in CD. BIA calculations for individualized target values showed 17 (55%) patients had decreased soft lean mass and 14 (45%) decreased body fat. 4 showed reduced both values without nutritional risk in any of tools.

**Conclusion.** Both screening tools have similar applicability for nutritional screening. NRS2002 might be less sensitive for patients without acute disease exacerbation, so more appropriate for inpatients screening. Where MUST is easier and more sensitive for patients self-testing having disease with low activity index.

## WAIT TIMES TO RHEUMATOLOGY CARE FOR PATIENTS WITH RHEUMATIC DISEASES IN LATVIA

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**Keywords.** Wait times, rheumatic diseases, rheumatology care.

**Objectives.** The impact and burden of rheumatic diseases (RD) on overall world population health in terms of death and disability are growing. Timely rheumatology care is crucial because it increases early exposure to treatment, improves patient outcomes, therefore, reduces the global disease burden. The aim of this study was to quantify wait times to primary and rheumatology care.

**Materials and methods.** First-time rheumatic out-patients were asked to fill out the questionnaire in order to identify sociodemographic characteristics, duration of each phase of the care pathway and reasons for delayed care. Descriptive statistics and nonparametric tests were used to determine differences in wait times in each phase of the care pathway by patients' gender, place of residence and clinical diagnosis.

**Results.** The total of 45 first-time referral out-patients completed the questionnaires, 34 (75.6%) were female. The mean age at the time of referral was 56.4 (SD 10.8) years. 28 patients (62%) were not satisfied with the duration of time from symptom onset to rheumatologist consultation. The main reason for delayed first rheumatology care encounter was: long waiting times (89%). The median wait time from symptom onset to primary care encounter was 30 (IQR 7-90) days, the median wait time from referral to rheumatologist consultation was 90 (IQR 30-150). No statistically significant differences were found in wait times in each phase of the care pathway by gender, place of residence and clinical diagnosis.

**Conclusion.** Wait times to see a rheumatologist in Latvia exceeded acceptable benchmarks. Therefore, improving timely access is critical and pressing, targeted efforts are needed to improve it.

## KIDNEY FUNCTION IN PATIENTS WITH ACUTE CEREBRAL INFARCTION

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**Keywords.** Cerebral infarction, chronic kidney disease, diabetes mellitus.

**Objectives.** Cerebral infarction is one of the most frequent causes of death and impaired life quality. High rate of mortality and disability is related not only with neurological deficiency but also with comorbidities such as cardiovascular diseases, arterial hypertension, type 2 diabetes mellitus (DM), kidney dysfunction etc.

Aim was to investigate association of acute cerebral infarction, diabetes mellitus type 2 and impaired kidney function.

**Materials and methods.** The retrospective study included patients who were hospitalized in Pauls Stradins clinical university hospital neurology department in a time period of 01.01.2016- 31.05.2016 with diagnosis acute ischemic cerebral infarction. Kidney dysfunction was diagnosed by measurements of serum creatinine. Analysis of data was performed using IBM SPSS statistics 22, MS Excel.

**Results.** Overall from 428 patients with acute cerebral infarction 114 were excluded due to lack of data. Out of 314 patients 139 were males (44%). Mean age was 74.07 years, age group 26- 99. During admission 99 (31.5%) patients had already known chronic kidney disease (CKD), and 49 (15.6%) patients had DM type 2. Median glomerular filtration rate (GFR) on admission was  $\leq 72.15$  ml/min/1,73m<sup>2</sup> and  $\leq 77.30$  ml/min/ 1,73m<sup>2</sup> on discharge. In patients with CKD GFR increased during hospitalization (mean 49,428 to 63,756 ml/min/1,73m<sup>2</sup>), but in patients without CKD GFR changes were not significant (85,361 to 89,641 ml/min/1,73m<sup>2</sup>). In patients with DM type 2 GFR increased minimally (83,830 to 93.440 ml/min/1,73m<sup>2</sup>) and in patients without DM type 2 GFR changes were not significant (85,361 to 89,641 ml/min/1,73m<sup>2</sup>).

**Conclusion.** Although all patients had serious vascular disease, only 30% of them had serious kidney problem such as CKD and only 15% of the study group had DM type 2. Interestingly, no acute kidney injury or kidney function deterioration after acute cerebral infarction was observed in this study.

## ACUTE REJECTION AFTER KIDNEY TRANSPLANTATION: ANALYSIS OF IMMUNOSUPPRESSIVE TREATMENT

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**Keywords.** Kidney transplantation, acute rejection, immunosuppressive drugs.

**Objectives.** Acute rejection is the main factor that influences both long term function and survival of transplanted kidney. In majority of cases, acute rejection develops in the first 6 months after transplantation, therefore immunosuppressive regimen before and after operation is particularly important. To analyze immunosuppressive treatment in patients with acute rejection and to estimate most optimal immunosuppressive drug combination.

**Materials and methods.** The research was a retrospective study based on analysis of patient's medical histories. Patients were divided into 13 groups according to prescribed combination of immunosuppressive drugs (mycophenolate mofetil, prednisolone and tacrolimus or cyclosporin) and their doses to assess the incidence of acute rejection. In addition listed drugs and induction immunosuppressive therapy was analyzed separately. Obtained data were analysed in IBM SPSS Statistics 24.0.

**Results.** Data of 106 patients aged 21 to 73 were analysed. Acute rejection (confirmed by biopsy) was observed in 39 patients (34.8%). Induction immunosuppressive therapy type did not show significant impact on incidence of acute rejection ( $p = 0.45$ ). From 13 immunosuppressive drug combinations, 2 showed statistically significant results ( $p = 0.016$ ): acute rejection was observed less frequently with mycophenolate mofetil 1-1,5g, prednisolone 10-15mg and tacrolimus, but more frequently with mycophenolate mofetil 1-1,5g, prednisolone 5-10mg and cyclosporin. Acute rejections were observed more often with cyclosporine than tacrolimus, but the choice between them or their doses did not reach statistically significant difference ( $p = 0.5$ ;  $p = 0.165$ ;  $p = 0.061$  accordingly). Lower prednisolone dose was associated with more episodes of acute rejection ( $p = 0.002$ ).

**Conclusion.** Research indicates the most optimal immunosuppressive drug combination – mycophenolate mofetil 1-1.5g, prednisolone 10-15mg and tacrolimus.

Lower prednisolone dose is associated with more episodes of acute rejection, therefore it should not be less than 10mg at least 6 months after transplantation.

## INFECTIONS IN ASSOCIATION WITH IMMUNOSUPPRESSIVE THERAPY AFTER KIDNEY TRANSPLANTATION

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**Keywords.** Kidney transplantation, opportunistic infections, tacrolimus, cyclosporin, leukopenia.

**Objectives.** Opportunistic infections (OI) is a common problem in patients after kidney transplantation due to immunosuppression. These infections can both influence patient's morbidity and mortality, therefore it is crucial to consider the most appropriate immunosuppression regimen. To assess the frequency and types of opportunistic infections among transplanted patients. To determine, whether increased prevalence of these infections is associated with higher calcineurin inhibitors levels in blood and leukopenia.

**Materials and methods.** The research was a retrospective study based on analysis of patient's medical histories from 2005 till 2015. First, prevalence of OI was determined. Then patients were divided into 3 groups according to their calcineurin inhibitor (CI) levels (normal, decreased or increased), measured in three consecutive years. The prevalence of OI was determined in association with these groups and leukopenia (leukocytes < 4000/mm<sup>3</sup>). Obtained data were analysed in IBM SPSS Statistics 24.0.

**Results.** Data of 106 patients aged 21 to 73 were analysed. At least one OI was observed in 27 patients (25.5%) that included BK polyoma virus (n = 3), *Pneumocystis jirovecii* (n = 3), candida (n = 10), Herpes simplex virus-1 and -2 (n = 3), acute cytomegalovirus (n = 10) and Varicella zoster virus infections (n = 4). Leukopenia was observed in 13 patients (12.3%). Prevalence of OI were significantly higher in patients with leukopenia (n = 7; 53.8%) than others (n = 20; 21.5%), p = 0.019. The doses of glucocorticoids and antiproliferative medications were without significant difference among patients. Analysis showed that there was no statistically significant association between CI levels and prevalence of opportunistic infections. There was a tendency to have more OI with cyclosporin and sirolimus, but it did not reach statistically significant result.

**Conclusion.** The prevalence of opportunistic infections is not associated with the choice of immunosuppressants or their levels in blood, but with patients' individual reaction to immunosuppressive therapy in the form of leukopenia.

## ANALYSIS OF KIDNEY GRAFT FUNCTION IN RECIPIENT PAIRS FROM DECEASED DONORS

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**Keywords.** Kidney transplantation, kidney function, influencing factors.

**Objectives.** Kidney transplantation from deceased donor usually provides transplants for two recipients. The kidney graft function is influenced by both recipient and donor factors. Recipient factors can be assessed among pairs with significant difference in long term graft function. Aim was to evaluate a kidney transplant function in recipient pairs from the same deceased donor and determine possible recipient factors that can influence it.

**Materials and methods.** A retrospective study was based on analysis of patients' medical histories who received kidney transplant from deceased donor from 2010 till 2015. A kidney graft function was assessed by glomerular filtration rate (GFR) that was calculated by CKD-EPI equation from serum creatinine. The difference in GFR more than 10 ml/min/1,73 m<sup>2</sup> was assumed as statistically significant. Recipient pairs with statistically significant difference in GFR were selected, divided into groups with higher and lower GFR, and analysed by 11 possible influencing factors. Obtained data were analysed in IBM SPSS Statistics 24.0.

**Results.** 90 patients (45 pairs) aged 21 to 73 were included in the study. GFR measurements three years after transplantation showed insignificant difference in 18 pairs (40%), significant difference in 27 pairs (60%). Further analysis showed that acute rejection was the only statistically significant influencing factor on GFR ( $p = 0.047$ ). Factors without significant influence were age ( $p = 0.507$ ), gender ( $p = 1.00$ ), etiology of CKD ( $p = 0.807$ ), urinary retention ( $p = 0.491$ ), recurrent or persistent pyelonephritis ( $p = 0.610$ ), immunosuppressive drugs and their blood levels ( $p = 0.506$ ,  $p = 0.272$  accordingly), secondary hypertension ( $p = 0.327$ ), diabetes mellitus ( $p = 0.501$ ) and drug nephrotoxicity ( $p = 0.491$ ).

**Conclusion.** Kidney graft function analysis showed that majority of recipient pairs had statistically different GFR in long term. The only significant graft function influencing factor among these pairs was acute rejection.

## SEX DIFFERENCES IN ALL-CAUSE MORTALITY IN PARTICIPANTS WITH TYPE 2 DIABETES MELLITUS AND NON-DIABETIC INDIVIDUALS

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**Keywords.** Mortality, type 2 diabetes mellitus.

**Objectives.** Type 2 diabetes mellitus (T2DM) is associated with disabling co-morbidities and lethal complications such as cardiovascular diseases and kidney disease. According to the Diabetes Register data, 86 639 patients with T2DM were registered in Latvia in 2017 with mortality rate around 45.33 per 1000 py in 2012.

Aim is to update information regarding predictors of all-cause mortality in men and women with T2DM and non-diabetic individuals.

**Materials and methods.** Cox Proportional-Hazards model was applied to analyse data of n = 879 non-diabetic volunteers and n = 879 participants with T2DM from The Genome Database of the Latvian Population (LGDB) matched by age and sex.

**Results.** Mortality predictors were analyzed in n = 986 women and n = 772 men, separately. Mean age for women was 63,61 ± 9,64 years and 170 deaths occurred in the period of this study. Mean age for men 59,91 ± 10,04 years and 147 deaths occurred during the study. In both groups mortality was positively associated with age, smoking and diagnosis of T2DM, whereas physical activity decreased the risk. Interestingly, only in women mortality risk was negatively associated with BMI in 25-35kg/m<sup>2</sup> interval (HR 0,62 (95 % CI 0,41 - 0,95); p < 0,01). In contrast, in men group exclusively negative mortality predictor was patient's education level: HR for men with high school diploma was 0,43 [95 % CI 0,29 - 0,67] and with bachelor's degree - 0,39 (95 % CI 0,24 - 0,65).

**Conclusion.** Most of the investigated mortality predictors were similar in the non-diabetic volunteers and T2DM cases; however significant disparities between sexes were observed in this study. Further studies are necessary to determine if the difference in education level in men and BMI in women justifies the gender-specific impact on all-cause mortality.

## PREVALENCE OF ANEMIA IN KIDNEY TRANSPLANT RECIPIENTS

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**Keywords.** Kidney transplantation, anemia.

**Objectives.** Anemia is a common complication of chronic kidney disease that patients have before kidney transplantation. However, a significant number of recipients still has or develop de novo anemia a year or later after the transplantation. Study was done to estimate the prevalence and type of anemia in kidney transplantation recipients.

**Materials and methods.** The retrospective study was conducted by reviewing medical records of patients who underwent kidney transplantation during the period of 2014–2015. Hb (hemoglobin), MCV (mean corpuscular volume), MCHC (mean corpuscular hemoglobin concentration) levels were analyzed one year and three years after transplantation to assess if they had anemia, what kind of anemia and how severe (mild anemia > 100 g/L, moderate 80-100 g/L, severe < 80 g/L). For statistical analysis IBM SPSS 23.00 was used.

**Results.** 96 patients were included in the study (56% male, 44% female). One year after the transplantation 49 (51%) patients had anemia. 46 (94%) of them had mild anemia, two (4%) had moderate and one (2%) patient had severe anemia. Three years after transplantation 31 (39%) patients had anemia. 30 (97%) of them had mild anemia and one (3%) patient had moderate anemia. Normochromic normocytic anemia was seen in 27 (55%) patients, hypochromic normocytic anemia in 10 (20%) patients, normochromic macrocytic anemia in 6 (12%) patients and hypochromic macrocytic anemia in four (8%) patients.

There was no statistically significant difference between the age of patients with or without anemia (mean age 44,53 vs 46,19 years). Both one and three years after transplantation men were more likely to have anemia than women (67% and 74%,  $p < 0,05$ ).

**Conclusion.** The prevalence of anemia was higher one year after kidney transplantation than three years after transplantation and anemia becomes milder with time after transplantation surgery. Interestingly, that men were more prone to having anemia than women after kidney transplantation.

## RESULTS OF KIDNEY TRANSPLANTATION FROM DECEASED DONORS WITH ACUTE KIDNEY INJURY

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**Keywords.** Kidney transplantation, acute kidney injury, deceased donors.

**Objectives.** Due to increased need of kidney transplantations (KT), deceased donors with acute kidney injury (AKI) could shorten the transplant wait time.

The aim of the study was to compare outcomes of KT in recipients who received grafts from donors with AKI versus donors without AKI.

**Materials and methods.** A retrospective study included recipients who underwent KT from deceased donors during 2010 - 2015. Recipients were divided in three groups by the level of serum creatinine of the donor at the time of kidney procurement: 1. Normal serum creatinine level ( $< 110 \mu\text{mol/l}$  - upper normal reference value of Latvian Transplantation center laboratory) ( $n = 169$ ); 2. Increased serum creatinine level ( $110 \mu\text{mol/l} - 165 \mu\text{mol/l}$ ) ( $n = 55$ ); 3. Serum creatinine levels reaching AKIN classification ( $\geq 165 \mu\text{mol/l}$ ) ( $n = 42$ ). Data was analyzed using IBM SPSS Statistics 22.0. Survival rates were calculated using Log Rank (Mantel-Cox).

**Results.** Study included 268 (52% males, average age - 47.5 years) patients. The number of patients who underwent repeated transplantation was similar in all groups: second transplantation (1. 17.75%; 2. 14.54% ; 3. 12.9%) or third transplantation (1. 2.96%, 2.3.63% 3. 2.58%) ( $p = 0.889$ ). There were no statistically significant differences between the groups regarding development of two most common complications after kidney transplantation: delayed graft function: (1. 17.9%, 2. 18.2%, 3. 16.3%,  $p = 0.965$ ) and biopsy proved acute rejection was following (1. 27.8%, 2. 25.5%, 3. 16.7% ( $p = 0.305$ )). 3-year graft survival rate was following in each of groups: 1.85.5%, 2. 86.76%, 3. 90.9%, ( $p = 0.534$ ) and 3-year patient survival rate was similar as well: 1. 95.16%, 2. 98.52%, 3. 94.64% ( $p = 0.18$ ).

**Conclusion.** Outcomes of kidney transplantation from deceased donors with acute kidney injury are not statistically significant different from outcomes of donors with normal kidney function. Donors with acute kidney injury could be a viable source of kidney transplants.

## GASTROINTESTINAL SYMPTOMS AND COLONOSCOPY FINDINGS IN PATIENTS WITH POSITIVE FECAL OCCULT BLOOD TEST WITHIN THE COLORECTAL CANCER SCREENING

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**Keywords.** Colorectal cancer screening, symptoms, colonoscopy findings.

**Objectives.** Colorectal cancer (CRC) is forth most common cancer in Latvia. The incidence is inalterable in last few years. CRC screening program (fecal occult blood test – FOBT, if positive – colonoscopy) in Latvia was introduced in 2009. Symptomatic patients more frequently have late-stage CRC than non-symptomatic patients. Furthermore, many of screening positive patients do not have any positive finding in colonoscopy.

The purpose of this study was to determine the association between symptoms and colonoscopy findings and frequency of colonoscopy negative findings.

**Materials and methods.** A prospective study was conducted in Digestive Diseases Centre "GASTRO" during period from September to December 2018. 42 FOBT positive patients before colonoscopy examination were asked to fill questionnaire which contained of 30 questions about gastrointestinal symptoms. Data was processed by Microsoft Excel and SPSS programs. The questionnaire, colonoscopy and histological conclusions were analyzed with SPSS sing Pearson's correlation coefficient, Chi square test.

**Results.** The study population was predominantly females – 76% (n = 32). Completely asymptomatic were 14% of patients (n = 6). In colonoscopy 26% (n = 11) of patients did not have any findings and only 17% (n = 7) had significant finding – adenomatous polyps. Other common findings were hemorrhoids (38%, n = 16) and hyperplastic polyps (12%; n = 5). Using Pearson's correlation a weak positive correlation was found between hyperplastic polyps and changes in bowel habits (r = 0,314; p = 0,043). Using Pearson's correlation and Chi square tests there were no statistically significant correlation between adenomatous polyps and any of symptoms.

**Conclusion.** 83% (n = 35) of patients who underwent colonoscopy had negative finding. This study showed no statistically significant correlation between any gastrointestinal symptoms and colonoscopy significant findings.

## DIABETIC NEPHROPATHY AND CHRONIC GLOMERULONEPHRITIS IN PATIENTS AT THE TERMINAL STAGE IN LATVIA

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**Keywords.** Diabetic nephropathy, chronic glomerulonephritis, end-stage renal disease.

**Objectives.** Diabetic nephropathy (DN), chronic glomerulonephritis (CG) – are the main causes of end-stage renal disease worldwide, also in Latvia following the data of 2017.

Aim was to compare the two diseases – DN, CG that cause chronic kidney disease at the terminal stage.

**Materials and methods.** A retrospective analysis was carried out comparing 468 cases (129 DN, 339 CG patients) on renal replacement therapy (RRT). The data of the year 2017 were taken from the Register of the Latvian Association of Nephrologists including the information of 25 (80%) RRT centres of Latvia. The data were processed with Microsoft Office Excel 2016, IBM SPSS 22.0.

**Results.** The median age in the DN group was 61 years (23-85), in CG group – 52 years (13-89). There are following types of RRT: haemodialysis (HD) (CG 58.4%, DN 68.7%), peritoneal dialysis (PD) (CG 20%, DN 28.4%), kidney transplantation (CG 21.6%, DN 3%). In both cases, kidneys for transplantation were donated by relatives (27.6%), known donors (10.3%), the deceased (62.1%). In 2017, 20.9% of all the DN patients (ratio women/men = 37/63) and 5.3% (ratio = 50/50) of all the CG patients died.

The main causes of death in 2017 were sudden cardiac death (SCD) (DN 29.6%, CG 27.8%), sepsis (DN 14.8%, CG 22.2%), cerebral infarction (CI) (DN 11.1%, CG 16.7%).

**Conclusion.** DN occurs at older age, CG begins at puberty. DN patients undergo significantly fewer kidney transplantation; more men. RRT – HD and PD are less used in cases of CG than DN. In 2017, in cases of CG and DN the kidneys for transplantation were donated by 18 deceased, 8 relatives and 3 known donors.

DN mortality rate – more predisposed among men 1.7 times more.

The main causes of death in both groups of diseases are SCD, sepsis, CI.

## ASSESSMENT OF NUTRITIONAL STATUS AMONG PATIENTS UNDERGOING HEMODIALYSIS. LINKS OF MALNUTRITION'S CRITERIA WITH OTHER LABORATORY BLOOD TESTS

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**Keywords.** Hemodialysis, malnutrition.

**Objectives.** Malnutrition is a very common state among patients undergoing hemodialysis, however this condition is rarely examined and diagnosed. Protein and energy supply deficiency in these patients lead to higher morbidity and mortality risk.

The aim of our study was to evaluate the nutritional status of patients undergoing hemodialysis in Vilnius city clinical hospital and to analyse the links of malnutrition's criteria with other laboratory blood findings.

**Materials and methods.** 30 stable patients were included into the research. Clinical data was collected from the documentation of the out-patient hemodialysis and bioelectrical impedance analysis. Laboratory blood tests such as albumin, cholesterol, hemoglobin, electrolytes, creatinine, urea, PTH, CRP were evaluated. Patients were divided into groups, according to the malnutrition criteria: albumin, cholesterol, body mass index, weight changes over the last six months. Their blood tests were compared. Data was processed with Microsoft Excel and IBM SPSS®. Differences were considered to be statistically valid if  $p < 0.05$ .

**Results.** According to the malnutrition's criteria by the International Society of Renal Nutrition and Metabolism: BMI  $< 23 \text{ kg/m}^2$ , albumin  $< 38 \text{ g/l}$ , cholesterol  $< 2,6 \text{ mmol/l}$ , weight loss  $> 5\%$  in 3 months or  $> 10\%$  in 6 months – there were no patients who matched all these criteria. Patients with lower albumin levels had higher CRP concentrations. 8 patients (36,4%) out of 22 (8 patients were excluded, because they started dialysis later than 6 months ago) lost weight and 14 (63,6%) gained weight. In patients, who lost weight, PTH was significantly lower. Statistically significant moderate positive correlation between albumin and hemoglobin concentration was found ( $r = 0,368$ ,  $p = 0,046$ ).

**Conclusion.** The nutritional status of the patients' treated in Vilnius city clinical hospital does not fall into the category of malnutrition. The links between malnutrition's criteria and laboratory blood tests are similar to the results of previously published researches.

## COMPARISON OF THE LOCALLY EFFICACY OF 10-DAYS BISMUTH QUADRUPLE THERAPY AND TRIPLE THERAPY IN ERADICATION OF HELICOBACTER PYLORI

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**Keywords.** *Helicobacter pylori*, eradication, gastroenterology.

**Objectives.** *Helicobacter pylori* (HP) infection is a common risk factor of upper gastrointestinal diseases such as peptic ulcer disease, chronic, non-specific gastritis or dyspepsia. *H. pylori* infection is difficult to treat due to antibiotic resistance. Bismuth quadruple therapy (BQT) (PPI, bismuth, tetracycline, metronidazole/tinidazole) or not-bismuth, concomitant therapy (NBQT) (PPI, amoxicillin, clarithromycin, metronidazole/tinidazole) are currently recommended treatment regimens. Triple therapy (TT) (PPI, amoxicillin, metronidazole) can be considered if other therapies are not available. According to the Maastricht V/Florence Consensus the treatment duration should be extended to 14 days, unless 10 day therapy are proven effective locally. Aim of the study is evaluation of the locally efficacy of BQT and TT 10 days eradication of HP in Podlaskie Voivodeship.

**Materials and methods.** A retrospective analysis was performed on inpatients and outpatients of M.U.B. treated with BQT or TT between January 2015 to November 2018. HP infection was confirmed by urease rapid test (URT) ( $n = 83, 57,24\%$ ), stool antigen test (SAT) ( $n = 38, 26,21\%$ ), histology ( $n = 34, 23,45\%$ ) and/or HP anti-bodies ( $n = 21, 14,48\%$ ). The eradication assessment was confirmed by negative stool antigen test ( $n = 136, 93,79\%$ ), URT ( $n = 6, 4,14\%$ ) or histological ( $n = 3, 2,07\%$ ) results, Patients were excluded if they did not complete therapy or if their treatment regimen was unknown. U Mann-Whitney and the  $\chi^2$  test were used to analyse the data.

**Results.** Of the 145 HP-positive patients, 56 received BQT (38.62%) and 89 received TT (61.38%) both by 10 days. There were 88 female (60.69%), and 57 males (39.31%) in a mean age of  $58.32 \pm 13.25$ . Based on posttreatment SAT, BQT eradication rate (94,64%) was higher than TT (84,27%). However, there were not statistically significant differences ( $p = 0.0587$ ).

**Conclusion.** *Helicobacter pylori* eradication rates of 10 days BQT and TT based on SAT results, were relatively high and similar for both treatment schemes.

## DEPRESSION IN BRONCHIAL ASTHMA PATIENTS IN A GENERAL PRACTITIONER PRACTICE

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**Keywords.** Depression, asthma, patient health questionnaire (PHQ-9), asthma control test (ACT).

**Objectives.** Asthma is a heterogeneous disease, characterized by chronic airway inflammation and defined by history of respiratory symptoms – wheeze, shortness of breath, chest tightness and cough. Intensity of symptoms vary over time. Asthma is one of the most common chronic diseases worldwide affecting patient's quality of life and may have a negative effect on patient's psycho-emotional health in the long term, even causing depression. Aim was to assess presence of depression, its severity in asthma patients and its interconnectedness with asthma control level.

**Materials and methods.** This is a prospective, qualitative study. It was conducted in a general practitioners practice (GPP), 80 patients were surveyed using (PHO-9) and (ACT). Patients for asthma group were selected randomly of those who meet inclusion criteria: 18 years of age, confirmed asthma diagnosis. Patients in control group were selected randomly from GPP. Data processing and interpretation was made using IBM SPSS statistics 23 program.

**Results.** 80 respondents were surveyed (100%), 43 women (53,8%) and 37 men (46,3%). 40 patients were in asthma group and 40 patients in control group. Mean age of participants was  $48,86 \pm 17,17$  years. PHQ-9 showed depression of varying severity in 60,2%(n = 48). Of all respondents(n = 80) 23,8% reported mild depression, 18,8% moderate depression, 16,3% moderately severe and severe 1,3% depression. 87,5% (n = 35) of asthma study group met depression criteria. 32,5%(n = 13) of those had severe or moderate depression. 12,5% (n = 5) respondents from asthma study group did not meet depression criteria. 67,5% (n = 27) of control group did not meet depression criteria. 32,5% (n = 13) meet the depression criteria. Results showed moderate negative correlation between asthma and depression severity ( $r = -0,57$ ,  $p < 0,05$ ).

**Conclusion.** Study results revealed higher depression rate in asthma patients than in control group. Depression severity increases in patients with poor asthma control.

## SURGERY, ONCOLOGY

### EFFECTIVENESS OF DUAL ANTIBACTERIAL THERAPY IN CHILDREN WITH UNCOMPLICATED ACUTE APPENDICITIS

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**Keywords.** Appendicitis, antibacterial therapy, pediatrics.

**Objectives.** The aim of the study was to evaluate whether dual antibacterial therapy is safe and effective as first line treatment for children with diagnosis of uncomplicated acute appendicitis (UCAP).

**Materials and methods.** A retrospective study was made to evaluate symptoms and signs, laboratory and ultrasound (US) findings among patients aged 7-18 years old admitted to Children's Clinical University Hospital emergency department with a diagnosis of uncomplicated acute appendicitis (UCAP) (January 2017 - December 2017). All patients underwent dual antibacterial treatment with ampicillin and metronidazol. Data were processed by using Microsoft Office Excel 2016 and IBM SPSS Statistics 22 programs (Shapiro-Wilk's Test, Spearman's Correlations Test;  $p < 0.05$ ).

**Results.** A total of 98 patients were included (boys 51% ( $n = 50$ )). Mean age was 12.6 (SD = 2.9). 93% of patients ( $n = 91$ ) improved with antibiotic treatment and were discharged within 3-10 days, without surgery. 7 of them had surgery within 48 hours after admission, another 2 underwent elective appendectomy after they were discharged: one after 3 weeks and the other after 9 weeks respectively (treatment success rate - 89%). There was significant positive moderate correlation between C- reactive protein (CRP), white blood count (WBC), basophil granulocytes (BASO) and appendix diameter at admission and after 48 hours of dual antibacterial therapy. ( $r = 0.31$ ,  $p = 0.003$  vs.  $r = 0.37$ ,  $p < 0.001$  vs.  $r = 0.41$ ,  $p = 0.017$  vs.  $\rho = 0.51$ ,  $p = 0.013$ ). There was no significant correlation between neutrophils (NEUT) before and after antibacterial treatment ( $r = -0.004$ ,  $p = 0.979$ ). There was significant positive moderate correlation between duration of symptoms and CRP at admission ( $r = 0.380$ ,  $p < 0.001$ ).

**Conclusion.** A significant decrease of CRP, WBC, BASO values and appendix diameter in US were observed in children with UCAP during time period from admission and after 48 hours of dual antibacterial therapy.

## NECESSITY OF VENTRICULAR SEPTAL DEFECT SURGICAL CLOSURE IN LATVIAN

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**Keywords.** Ventricular septal defect, congenital heart defect, open-heart surgery.

**Objectives.** Isolated ventricular septal defect (VSD) is one of the most common congenital heart defect, accounts for about 35% of all defects. Most patients with moderate to large VSDs should undergo surgical repair during the first year of life to prevent further complications. The aim was to assess patients with necessity of VSD surgical closure and evaluate operation outcomes.

**Materials and methods.** A retrospective study was made including 130 patients (54 (41%) female, 76 (59%) male) who underwent surgical closure of isolated VSD between January 2008 and December 2015. The size of the VSD was evaluated using the ratio – defect size/aortic valve. The surgical outcome was estimated using echocardiographic data. Mean follow-up time was 1.5 year. The data was analyzed using SPSS.

**Results.** Mean age at the operation time was 1 year 2 months (2 months – 13 years) and median weight was 8 (3-31) kg. VSD types were: 113 (87%) perimembranous, 11 (8.5%) inlet, 2 (1.5%) outlet and 4 (3%) muscular defects. Small defect had 3 (2%) patients, 78 (60%) patients had a moderate and 49 (38%) patients had a large VSD defect. Postoperative residual shunts were seen in 44 (34%) patients, for 68% shunts closed on average time of 1 year, but for 32% they hadn't close at the time of their follow up. Tricuspid valve regurgitation was seen in 31 (24%) patients, where trivial regurgitation was 75%, moderate was 22%, and severe was 3%. A statistically significant correlation between tricuspid valve regurgitation and VSD size was found ( $p = 0.016$ ). Linear fractional shortening was  $41.3 \pm 3.8\%$ . During follow up no patient needed reoperation.

**Conclusion.** The most common type was moderate perimembranous defect. Tricuspid regurgitation was more common in patients with large defect, but general complication rate is low. Residual shunts < 2mm tend to close spontaneously in one year. Overall surgical outcome is evaluated as good.

## SAFETY AND FEASIBILITY OF 24 HOURS STAY FOLLOWING LAPAROSCOPIC COLECTOMY: EXPERIENCE FROM TWO UK CENTRES

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**Keywords.** Colectomy, laparoscopy, enhanced recovery, eras.

**Objectives.** Enhanced recovery programs combined with minimally invasive surgery have significantly reduced hospital stay after elective colorectal resections. This paper aims to study the feasibility and safety of 24hrs discharge following laparoscopic colectomy.

**Materials and methods.** Prospectively collected data from two UK centers, ranging from 2006 to 2016 was analyzed. Patients with both benign and malignant pathology undergoing elective laparoscopic colonic resections were included. A standardized, modular approach to surgery in combination with enhanced recovery program were followed, except for epidural analgesia being replaced with single shot spinal infiltration. To confirm safe discharge, patients were followed up by a nurse-lead telephone call system. The short-term clinical outcomes were analyzed.

**Results.** A total of 833 patients underwent elective laparoscopic colonic resections. A total of 51 (6.1%) patients were discharged within 24 hours following surgery. From them, 4 (7.8%) patients were readmitted within 30 days of discharge and 2 (3.9%) required reoperation (small bowel obstruction & wound abscess drainage). Prognostic factors correlating with failure to discharge within 24hrs were female sex ( $p = 0.018$ , OR 2.041, CI 95% 1.130-3.687) and benign pathology ( $p = 0.044$ , OR 2.441, CI 95% 1.025-5.810).

**Conclusion.** This study demonstrates that the concept of a 24-hour discharge following elective laparoscopic colorectal resections is safe and feasible in selected patients. Although challenging to achieve, a standardized approach to laparoscopic surgery in combination with a strict adherence to an enhanced recovery protocol are the fundamental elements towards this path.

## MACHINE PERFUSION AS A NOVEL PRESERVATION METHOD FOR DECEASED-DONOR KIDNEYS IN LATVIA

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**Keywords.** Kidney transplantation, expanded criteria donor, machine perfusion, LifePort.

**Objectives.** Accumulating evidence from foreign transplant centers suggests the hypothermic machine perfusion to be a superior method for donor kidney storage before transplantation compared with cold static storage (further referred to as CS). The present study was conducted to investigate the short-term outcomes of deceased expanded-criteria donor (ECD) kidney transplantation in Latvian Transplant Center (LTC) since the introduction of LifePort Kidney Transporter (LP) in the year 2018.

**Materials and methods.** A retrospective analysis was conducted of posttransplant outcomes in patients who have received deceased ECD kidneys preserved until transplantation connected to LP. Patients, who received the contralateral kidney preserved conventionally using CS, formed the control group.

**Results.** Altogether 14 kidneys from 7 deceased ECD had been removed and transplanted into recipients since the introduction of LP. LP and CS recipient groups were not significantly different in regard to donor kidney allocation (left or right), recipient demographic parameters, donor-recipient HLA matches, transplantation duration, or duration of dialysis before transplantation (for all,  $p > 0.05$ ), while cold ischemia time was significantly longer in LP group ( $25.5 \pm 4.8$  vs  $17.4 \pm 5.3$  h for LP vs CS;  $p = 0.0434$ ). Delayed graft function was observed in a single patient from each group, while two patients in the CS and a single patient in LP group developed acute humoral rejection. Patients in LP group stayed in hospital on average 5 days less than patients in the CS group and were more commonly discharged with normal serum creatinine levels, but the differences were not statistically significant. Glomerular filtration rate appeared to be on average 1.4 times higher in LP group compared to the CS group one week and one month after transplantation, as well as upon discharge.

**Conclusion.** Despite the increased cold ischemia time in LP group, the short-term transplant function appears to be equal or even enhanced and is associated with shorter hospital stay compared to the CS group. The present study should be continued to expand the study groups and to observe the long-term outcomes before the preferred method for ECD kidney storage until transplantation could be recommended.

## THE USE OF AUTOPERICARDIUM IN PEDIATRIC CARDIAC SURGERY: A SINGLE CENTER FIFTEEN YEAR REVIEW

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**Keywords.** Autopericardium, open-heart surgery, follow-up.

**Objectives.** Autopericardium is an autologous pericardial material and is used in heart surgery because of its eligible biomechanical properties. It can be used in native form or glutaraldehyde-stabilised, which provides better mechanical endurance to intracardiac pressure. Since synthetic polymers and xenologous materials are obtaining significant role in heart surgery, this study analyzes autopericardium usage and clinical outcomes.

**Materials and methods.** Retrospective analysis included 240 patients who underwent an open-heart surgery for congenital heart defect using autopericardium from January 2000 to December 2015 in Children's Clinical University Hospital of Latvia. The surgical outcome was estimated using echocardiographic data evaluating late complication development and need for reoperation. Follow-up included 129 patients up-to 18-years-old. Data was analyzed with SPSS.

**Results.** The mean age at the time of operation was 50 months (95% CI, 43.3-57.7). In 55% of cases (133) autopericardium has been used to close atrial septal defect (ASD), 15% (36) in atrio-ventricular-defect closure (AVSD), 12% (29) in Tetralogy of Fallot, 5% (11) in VSD and 13% (31) in other operations. Until year 2009 all (205) patches were only glutaraldehyde-fixed. As of 2010 also native patches started to be used. From year 2000 to 2009 the mean autopericardium usage was  $22.0 \pm 3.7$  SD surgeries per year but since 2010 to 2015 it dropped to  $5.8 \pm 2.3$  SD surgeries per year. During the follow-up (n = 129) no complications were found in ASD patients (70), one residual atrial and five residual ventricular defects were found in AVSD patients (22) and three residual defects in VSD patients (10). Patients with Tetralogy of Fallot (18) eight had residual pulmonary artery stenosis and five required reoperation.

**Conclusion.** The most frequent cause of autopericardium usage is in case of ASD closure with glutaraldehyde-fixed method. In most cases there are no late complications and a few patients with complex heart defects required reoperation. Changes in operation technique and other material availability immensely reduced autopericardium use after 2010.

## IDENTIFICATION OF BILIOVASCULAR ANATOMY BY USING INDOCYANINE GREEN FLUORESCENT CHOLANGIOGRAPHY IN PATIENTS WITH ACUTE CHOLECYSTITIS: FIRST EXPERIENCE IN SINGLE INSTITUTION

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**Keywords.** Image-guided surgery, fluorescence cholangiography.

**Objectives.** Iatrogenic biliovascular injuries after laparoscopic cholecystectomy (LC) are serious complications with an incidence of 0.3-1.5%. Achievement of "critical view of safety" is advocated but it is not always possible in patients with acute cholecystitis. Near-infrared fluorescence cholangiography (FCHA) using Indocyanine green (ICG) is non-invasive intraoperative technique for visualization of biliary tract anatomy by using fluorescence effect. The aim of the study was to share first experience by application of FCHA during LC for acute cholecystitis.

**Materials and methods.** Urgently admitted surgical patients with long standing anamnesis (>72 hours) for acute cholecystitis were prospectively included between June 2017 to August 2018 in Riga East Clinical University Hospital. Acute cholecystitis was graded in accordance to Tokyo 2018 guidelines. All patients underwent LC with FCHA. 25mg of ICG was diluted with 20mL of normal saline and 10mL of the solution was intravenously administered at least 2 hours before surgery. 10mL were injected intraoperatively for detection of cystic artery.

**Results.** Overall 9 patients with average age of 56 years (29-82) underwent urgent LC. Average time from first symptoms till surgery was 4 (3-11) days. 5 (56%) patients had moderate and 4 (44%) had mild acute cholecystitis. FCHA before dissection of Calot's triangle allowed successfully visualise the cystic duct in all patients and the cystic duct/common bile duct junction in 7 (78%). Identification of common hepatic and common bile duct was successful in 5 (56%) of patients. Cystic artery was clearly identified in 7 patients. Average operation time was 54 (40-80) minutes. There were no bile duct injuries or need for conversion to open surgery. In 78% FCHA improved visualization of biliary anatomy. Postoperative course was uncomplicated, and patients were discharged on average 2 days after surgery.

**Conclusion.** Fluorescent cholangiography can be safely used for better visualization of bile duct anatomy in patients with acute cholecystitis undergoing urgent laparoscopic cholecystectomy.

## ROLE OF NEXT DAY PARATHORMONE ASSAY AFTER SURGICAL APPROACH IN PRIMARY HYPERPARATHYROIDISM

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**Keywords.** Primary hyperparathyroidism, parathyroidectomy.

**Objectives.** Primary hyperparathyroidism (pHPT) is an endocrine pathology for which the only definitive management is surgery. Intraoperative parathyroid hormone (IoPTH) monitoring leverages to provide the success rate of parathyroidectomy (PTX). Operation considered to be successful if IoPTH measurement after 20 minutes decrease more than 50% compare to the initial highest IoPTH level. The study was designed to determine IoPTH drop and compare it with next day parathormone fall (ndPTH) level as predisposition for successful operation.

**Materials and methods.** A full retrospective case-control study was performed on 350 patients with PHPT operation since year 2011 till January 2019 in Pauls Stradins Clinical University Hospital. IoPTH was measured -preoperatively, in the gland mobilization time and 20 minutes after parathyroidectomy. One more PTH sample was taken 24 hours after operation. In our study IoPTH level drop was compared with next day PTH fall (ndPTH). IBM SPSS were used for statistical analysis.

**Results.** Study included 10% male (n = 35) and 90% female (n = 315) patients. The mean age was 60 years (19-82y.). Histologically approved 82% (n = 287) cases of parathyroid adenoma, 12.9% (n = 45) hyperplasia, 5.1% (n = 18) parathyroid cancers. Operation mean time was 74.83 minutes (variability 20-210 min). By the IoPTH marker 18.6% (n = 65) patients IoPTH fall was less than 50%, 81.4% (n = 285) IoPTH drop was greater than 50%. Marker ndPTH showed successful 94.9% (n = 332) operations and only 5.1% (n = 18) operations where PTH fall was less than 50%. There was found statistically significant correlation between marker ndPTH fall and operation time (P = 0.01).

**Conclusion.** The IoPTH assay revealed to be an important prognostic tool for parathyroidectomy, although, to see operation result, more important value is next day PTH level.

## METHODS OF EVALUATING FUNCTIONAL OUTCOMES IN PATIENTS FOLLOWING ANTERIOR RECTAL EXCISION FOR LOWER RECTAL CANCER

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**Keywords.** LARS scale, WEXNER scale, outcomes, correlation.

**Objectives.** Rectal cancer is a common and fatal disease and the anterior resection of rectum with total mesorectal excision is the main standart treatment. Unfortunately, many patients postoperatively suffer a constellation of symptoms including fecal urgency, frequent bowel movements, so called Low Anterior Resection Syndrome (LARS). The aim of the study was to assess bowel function after lower rectal cancer excision using LARS and WEXNER questionnaire and check for possible correlation between these methods.

**Materials and methods.** Retrospective data was collected of patients who received surgical treatment of rectal cancer between 2007 and 2012 in National Cancer institute in Vilnius. Between 2018 January and May the patients were contacted by phone in order to evaluate their bowel function outcomes using low anterior resection syndrome (LARS) score and Wexner incontinence scoring system for anal incontinence. Data was analyzed and statistical assessments were made using SPSS program.

**Results.** A total of 67 patients were evaluated during this study. Among this group, 34 were men and 33 were women. The average time of follow-up in the responders was 7.5 years. Overall, major LARS was experienced by 17 (25.37%) patients, while 13 (19.40%) had minor LARS and 37 (55.23%) reported no LARS. Wexner score results among the patients were as following: normal: 10 (14.93%), minor fecal incontinence: 40 (59.70%), average fecal incontinence: 12 (17.91%), complete fecal incontinence: 5 (7.46%). Lastly, a correlation check between total postoperative LARS score and total postoperative WEXNER score was performed. We found a correlation coefficient of 0.731 (with a significance level of  $p < 0.05$ ).

**Conclusion.** A statistically significant correlation between LARS and WEXNER scores was demonstrated. This implies that both scores should be used together to gain a wider perspective on patients function and quality of life.

## PATIENTS WITH ACUTE ABDOMINAL PAIN – EMERGENCY SERVICES AT NORDLAND HOSPITAL TRUST, BODØ, NORWAY – PRELIMINARY RESULTS

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**Keywords.** Abdominal pain, emergency services, differences in treatment.

**Objectives.** Traditionally, the first line doctors in Norwegian emergency rooms (ER) are recently graduated physicians or young residents. Recently some hospitals have engaged more experienced residents or occasionally formally qualified specialists as first line medical staff in the ER. We are not aware of studies from Norwegian hospitals analyzing the effect of experienced ER medical staff on the time patients spend in the ER. The aim of the study was to study the effects on patient stay in the ER having experienced doctors in the ER compared to inexperienced doctors at Nordland Hospital Trust, Bodø, Norway. The population studied was patients admitted to the ER with a primary diagnosis of acute abdominal pain.

**Materials and methods.** Data collected from the electronic health records in the periods March-June in 2017 with less experienced medical staff and March to June in 2018 with more experienced staff at 10:00 – 15:00 hours. 85 and 122 patients were included in 2017 and 2018 respectively. Statistics were calculated using MS Excel and SPSS version 25.

**Results.** The average waiting time before triage was performed decreased by 3 minutes (2017  $\bar{x}$  19 min  $\pm$  12 SD; 2018  $\bar{x}$  16 min  $\pm$  15 SD). The average time before the patients were seen by a doctor decreased by 1 minute (2017  $\bar{x}$  32 min  $\pm$  42 SD; 2018  $\bar{x}$  31 min  $\pm$  38 SD). The average time spent in the ER decreased by 56 minutes (2017  $\bar{x}$  4:28 hrs  $\pm$  0:48 SD; 2018  $\bar{x}$  3:32 hrs  $\pm$  1:45 SD).

**Conclusion.** In the data collected so far there has not been a significant difference regarding time before triage and supervision by a doctor. The average time spent in the ER was significantly decreased. This indicates that the presence of more experienced medical staff leads to a faster pathway through the ER for patients admitted with acute abdominal pain. The study is going to be continued and will include difference in the amount of laboratory tests and imaging studies done.

## COMPARISON OF MINIMALLY INVASIVE AND OPEN SURGICAL TREATMENT FOR SINUS PILONIDALIS

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**Keywords.** Pilonidal sinus, pilonidal sinus surgery, outcomes.

**Objectives.** The aim of this study was to compare minimally invasive and open surgical treatment for sinus pilonidalis.

**Materials and methods.** The retrospective study included 97 patients treated for sinus pilonidalis at Vilnius University Hospital Santaros Clinic in 2015–2018, of which 48 patients underwent minimally invasive surgical treatment (Group I) and 49 underwent open excision (Group II). The patients were interviewed 1 month – 3 years postoperatively.

**Results.** Operating time: Group I –  $18.1 \pm 6.5$  min, Group II –  $32.4 \pm 20.8$  min,  $p < 0.05$ . Hospitalisation days: Group I –  $1.6 \pm 0.8$ , Group II –  $3.6 \pm 3.2$ ,  $p < 0.05$ ; pain intensity after operation (VAS scale): Group I –  $3.7 \pm 2.7$ , Group II –  $5.6 \pm 2.8$ ,  $p < 0.05$ ; return to work after surgery (number of days): Group I –  $16 \pm 9.3$ , Group II –  $35.2 \pm 21.4$ ,  $p < 0.05$ ; return to social life (number of days): Group I –  $8.1 \pm 4$ , Group II –  $27.5 \pm 19.8$ ,  $p < 0.05$ ; recovery of physical activity levels. Group I –  $27.3 \pm 16.9$ , Group II –  $49.1 \pm 37.1$ ,  $p < 0.05$ ; satisfaction with the cosmetic result (5 = average to 10 = excellent): Group I –  $9.8 \pm 0.5$ , Group II –  $7.6 \pm 2.5$ ,  $p < 0.05$ . A total of 96.9% patients of Group I would opt for the same type of surgery, while the figure in Group II was 28.6%,  $p < 0.05$ . Relapse was greater in patients of Group I – 6 patients (18.8%) than in Group II – 2 patients (9.5%),  $p > 0.05$ .

**Conclusion.** The minimally invasive surgical technique for treating sinus pilonidalis is a superior procedure compared to open excision.

## THE IMPACT OF COLD ISCHEMIA TIME ON RENAL TRANSPLANTATION OUTCOME

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**Keywords.** Cold ischemia time, graft function, serum creatinine level, glomerular filtration rate.

**Objectives.** It is well known that kidney transplantation is the gold standard for the treatment of terminal chronic kidney disease. Many factors affect a graft function, the most important of which is cold ischemia time (CIT). CIT triggers a cascade of noxious effects, which are amplified by restoration of blood supply reperfusion. It may generate inflammatory and immune responses that may potentially result in delayed graft function, enhanced alloimmune reactivity and development of progressive pathological changes. The aim of our study is to evaluate CIT's impact on renal transplantation results.

**Materials and methods.** We analyzed kidney transplant recipients who underwent kidney transplantation in the Latvian Transplantation Center, between 01.01.2015 to 31.12.2016. All patients were divided into two groups: patients, whom CIT was less than twenty hours (group A) and patients, whom CIT exceeded twenty hours (group B). These groups were compared by serum creatinine level (SrCr) and glomerular filtration rate (GFR) one month and then one year after transplantation and one year patients and graft survival. For data analysis we used Mann-Whitney U and Chi-Square tests.

**Results.** Altogether 85 recipients were analyzed: group A – 63 patients and group B – 22 patients. Group comparison revealed that although statistically insignificant ( $p > 0.05$  in all cases), both one month and one year after transplantation SrCr was lower and GFR was higher in group A patients compared with group B. There were no differences in one year graft and patients survival between both groups.

**Conclusion.** During our study we found (although statistically insignificant) a trend that shows deterioration of the renal graft function as CIT is increased.

## SYSTEMIC INFLAMMATORY REACTION AND ITS RELEVANCE TO LYMPH NODE YIELD IN COLORECTAL CARCINOMA

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**Keywords.** Colorectal cancer, SIR, lymph node yield.

**Objectives.** Colorectal cancer (CRC) is the third leading cause of cancer-related deaths in the world. To precisely evaluate the surgical material pathologist should find at least 12 regional lymph nodes (LN) (Stocchi et al.2011). Insufficient LN retrieval is a problem in colorectal surgical pathology associated with inferior prognosis(Huang et al.(2016)). Recently, multidisciplinary approach has been proposed to solve this problem.(Choi et al.(2016)). The aim was to evaluate the association between SIR and LN yield in surgically treated CRC.

**Materials and methods.** This was a retrospective study including primary CRC cases in a single university hospital. The tissue was examined using a standardized morphological investigation protocol including the number of LN found in the samples. The cases were then classified by LN count as scant (< 12LN) or adequate yield (> 12LN). SIR was assessed by calculating cellular ratios using preoperative absolute blood counts: neutrophil-to-lymphocyte (NLR), platelet-lymphocyte (PLR), lymphocyte-monocyte (LMR), neutrophil-monocyte (NMR) ratios. Descriptive and analytical statistical analysis was applied to evaluate the results,  $p < 0.05$  was considered statistically significant.

**Results.** The study included 255 CRC cases. The median LN count was 11 [IQR 7.0-15.0]. In 60.8% [95% CI:54.7-66.7] cases LN yield was scant (< 12LN), while in 39.2% [33.3-45.3] it was adequate ( $\geq$  12LN). There was a statistically significant relation between LN count and LMR (Spearman`s  $r = 0.22$   $p = 0.004$ ; Mann-Whitney  $p = 0.02$ ). In the scant yield group the median of LMR was 2.5(IQR 1.6) while in the adequate yield it was 3.0 (IQR 2.3) No statistically significant association was found between retrieved LN count and NLR, PLR and NMR.

**Conclusion.** In surgically treated CRC an association between LMR and retrieved LN amount is found, that could, hypothetically, show chronic inflammation role within CRC progression. However, there was not any statistically significant association found between the retrieved LN count and NLR, PLR or NMR

## URINARY TRACT INFECTION INCIDENCE, RISK FACTOR AND INFLUENCE ANALYSIS IN KIDNEY TRANSPLANT PATIENTS

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**Keywords.** Kidney transplantation, urinary tract infection (UTI), kidney donor, kidney recipient.

**Objectives.** Urinary tract infection is the most common infection after kidney transplantation, according to American Journal of Transplantation. UTI is associated with the development of impaired allograft function, and recipient death. The objective of this retrospective study was to evaluate the incidence and risk factors of urinary tract infections and its influence on kidney function in kidney transplant patients in early postoperative period.

**Materials and methods.** A retrospective study was carried out using the data of 123 patients who had undergone kidney transplantation between the years 2014 and 2016 at the Latvian Transplantation centre. The data were collected from medical records and analysed with IBM SPSS.

**Results.** A total of 123 patient histories were analysed – 66 (53.7%) men and 57 (46.3%) women. Mean patient age was 51.29 (SD 13.32) years. Patients received kidneys from 80 donors – 55 (68.8%) men and 25 (31.2%) women. UTI developed in 35 (28.5%) patients. Donor, recipient and surgical factors were analysed. Out of donor risk factors, only age influenced the development of postoperative UTI – median age for negative UTI was 49 years (Q1 = 39, Q3 = 55), for positive – 57 (Q1 = 47, Q3 = 63.5),  $p = 0.019$ . Recipient sex was found a risk factor, with 42.1% ( $n = 24$ ) women and 16.7% ( $n = 11$ ) men developing UTI ( $p = 0.002$ ). Longer recipient hospital stay was also confirmed as a risk factor for UTI (median negative 14 (Q1 = 10, Q3 = 19), median positive – 20 (Q1 = 13.5, Q3 = 26.5),  $p = 0.002$ ). UTI itself appears to influence kidney function – discharge creatinine differed in patients – in patients without UTI mean creatinine was 0.14 (SD 0.045), with UTI – 0.17 (SD 0.078),  $p = 0.006$ .

**Conclusion.** UTI is a common complication after kidney transplantation. Donor age, recipient sex, and longer hospital stay appear to be significant risk factors for developing a UTI. UTI itself influences discharge creatinine.

## SURGICAL TREATMENT AND OUTCOMES FOR SECONDARY AND TERTIARY HYPERPARATHYROIDISM

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**Keywords.** Secondary hyperparathyroidism, tertiary hyperparathyroidism, parathyroidectomy.

**Objectives.** Parathyroidectomy (PTx) decreases mortality rate of refractory secondary hyperparathyroidism (SHPT) due to chronic kidney disease. PTx is the only definitive treatment for tertiary hyperparathyroidism (THPT). The aim of the study was to research the surgical treatment and outcomes in case of secondary and tertiary hyperparathyroidism.

**Materials and methods.** Retrospective study of patient data who underwent surgery from May 2016 till December 2018 due to SHPT (n = 10) – Group A and THPT (n = 8) – Group B was done. Data were analysed regarding parathormone (PTH) level before surgery, operation type, morphology and serum calcium (Ca) level after surgery.

**Results.** Mean PTH level prior surgery was higher in Group A than B –  $1263 \pm 498$  ng/ml vs  $400 \pm 245$  ng/ml. Regarding operation type, subtotal parathyroidectomy was method of choice in 90% (n = 9) of patients in Group A and 88% (n = 7) in Group B. Total parathyroidectomy performed in 10% (n = 1) and 12% (n = 1) respectively. In 60% (n = 6) of cases in Group A and 88% (n = 7) in Group B morphology revealed parathyroid hyperplasia. Parathyroid adenomas were found in 40% (n = 4) and 12% (n = 1) respectively. At the 1 month follow up hypocalcemia (Ca < 2.08 mmol/l) was more common in Group A than B: 50% (n = 5) vs 29% (n = 2). Normocalcemia noted in Group A and B – 50% (n = 5) and 71% (n = 5) of cases. No information about calcium level at 1st follow up had 1 patient of Group B.

**Conclusion.** Patients with SHPT tended for hypocalcemia after surgery therefore demanding closer monitoring and maintaining Ca homeostasis. In our analysis parathyroid adenomas were not rare finding in case of SHPT and THPT, which does not completely correspond literature data.

## INITIAL EXPERIENCE WITH COMPOSITE BILATERAL INTERNAL MAMMARY ARTERY Y GRAFTING IN CORONARY ARTERY BYPASS SURGERY

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**Keywords.** CABG, BIMA, total arterial revascularization, Y grafts.

**Objectives.** Use of bilateral internal mammary arteries (BIMA) in coronary artery bypass grafting (CABG) surgery provides better long-term outcomes than single internal mammary artery and saphenous vein grafting. Still there is debate how these grafts should be used to achieve complete myocardial revascularization. A composite BIMA graft in Y configuration allows full revascularization without any other graft material. This method although well described, has found routine application in our hospital only in the last years and yet awaits wider acceptance.

This study analysed perioperative and early outcomes of patients who underwent BIMA grafting with a composite Y configuration.

**Materials and methods.** From our operative records 61 patients were identified, who underwent total arterial CABG surgery with BIMA grafts in Y configuration as the only graft material from 2016 to 2018. Patient preoperative, intraoperative and pre-discharge data were analysed to assess the safety and early results of this procedure.

**Results.** In all patients, full myocardial revascularization was achieved with BIMAs alone, using a composite Y configuration with an average of 3.1 coronary artery anastomoses per patient. Mean patient age was 66.9 years, 16.4% had diabetes, 18% had left ventricular ejection fraction lower than 50% and 36.1% of patients have had a previous MI. Despite the sick patient population we observed no perioperative and intrahospital mortality in this initial series. Sternal wound infection was observed in 4 patients (6.6%).

**Conclusion.** Full myocardial revascularization can be achieved with good safety results in most patients with triple vessel disease. Relatively high sternal wound infection rate suggests that more stringent patient selection has to be considered, if possible avoiding BIMA harvesting in obese diabetic patients.

## LIVER ABSCESS ETIOLOGY AND CLINICAL MANIFESTATIONS

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**Keywords.** Liver abscess, etiology, clinical manifestation, bacteriological results.

**Objectives.** Liver abscess infection is relatively rare infection disease however, it has been described since the Hippocrates time. It is the second common infectious liver disease and can be life-threatening. It is caused by various organisms, including *K. pneumoniae*, *E. coli*, Gr+cocci and fungal infection. The aim of this study was to investigate the etiology by bacteriological results and clinical manifestations of patients with liver abscess.

**Materials and methods.** In the present investigation were retrospectively analyzed clinical manifestations and bacteriological results, including the species of pathogens in 47 patients who was admitted in PSKUS from January 2012 to December 2018 with liver abscesses. Diagnosis was made by clinical signs and ultrasound or CT. The main analyzed clinical manifestations were: weakness, malaise; jaundice, dyspepsia (nausea, vomiting); right upper quadrant abdominal pain and fever.

**Results.** In the drainage samples of 15 patients (30%) were positive for bacteria. *K. pneumoniae* were in 7 cases (44%); *E. coli* - in 5 cases (31%); Gr+ cocci - in 3 cases (19%) and fungal infection 1 case (6%).

By the clinical manifestations: 17 patients (36%) had weakness, malaise; 1 patient (2%) had jaundice, 11 patients (27%) had dyspepsia (nausea, vomiting) and 18 patients (38%) had right upper quadrant abdominal pain. Out of all 47 patients 21 had fever (45%).

**Conclusion.** Most of liver abscesses with identified pathogens were caused by bacterial infection. The most common were caused by *K. pneumoniae* and *E. coli*. In the present research was occurred case with fungal infection.

The most common clinical signs were fever and right upper quadrant abdominal pain.

## COLORECTAL CANCER METASTASES IN ASSOCIATION WITH PRIMARY TUMOUR CHARACTERISTICS IN SURGICALLY TREATED PATIENTS

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**Keywords.** Colorectal carcinoma, metastasis, metastatic colorectal cancer.

**Objectives.** It is estimated that approximately 20% of colorectal cancer (CRC) patients already have metastases at the time of diagnosis. Recently primary tumour location in different groups of mCRC has been studied as prognostic factor regarding long-term prognosis and patterns of metastases. Therefore, the objective of this study was to determine association between colorectal cancer metastases and primary tumour characteristics in surgically treated patients.

**Materials and methods.** Data from Centre for Disease Prevention and Control of Latvia and archive search were used to identify and retrospectively analyse surgically treated patients diagnosed with CRC in single university hospital (2013–2015). Patients with missing data on primary tumour site, history of surgery, histopathological characteristics were excluded. The study group included 327 patients. In 147 cases data on tumour invasiveness were evaluated. Descriptive and analytical statistics were performed including Mann-Whitney, Kruskal-Wallis and Chi square tests by IBM SPSS v23 software (USA).

**Results.** The median age of study group was 70.0 years (interquartile range, IQR 61.0–76.0). Females represented 52.6% [95% confidence interval: 47.4–58.1], males 47.4% [41.9–52.6]. The most common site of CRC was left side: 43.7% [38.5–48.9]. Metastases at diagnosis were present in 29.1% of cases. Of them extra regional lymph nodes (34.7%) and liver (32.6%) were most frequently affected. T and N showed statistically significant association with presence of metastases at the time of diagnosis ( $p = 0.005$  in both cases). Intraarterial ( $p = 0.031$ ), venous ( $p = 0.002$ ), neural ( $p = 0.026$ ) and perineural growth ( $p = 0.002$ ) as well as age ( $p = 0.005$ ) showed statistically significant association with presence of metastases.

**Conclusion.** Presence of metastases at the time of diagnosis are statistically significantly associated with invasion characteristics of primary tumour. Further studies are needed to evaluate impact of primary tumour invasion and long-term outcomes in mCRC.

## MORPHOLOGICAL DIFFERENCES BY COLORECTAL CANCER LOCALISATION IN SURGICALLY TREATED PATIENTS

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**Keywords.** Colorectal carcinoma, primary tumour location.

**Objectives.** Nowadays there is evidence that differences in clinical characteristics according to primary tumour location (PTL) in case of colorectal cancer (CRC) exists. Therefore, the effect of tumour localization as a prognostic factor on clinical outcome is being studied. The main goal of this study was to evaluate the association between primary tumour location and several clinical characteristics in case of CRC in surgically treated patients.

**Materials and methods.** Archive search and data from Centre for Disease Prevention and Control of Latvia were used in identification and retrospective analysis of surgically treated patients diagnosed with CRC in single university hospital (2013–2015). Exclusion criteria were: missing data on primary tumour site, histopathological characteristics and operation details. The study group consisted of 327 patients. In 147 cases, data on tumour invasiveness were evaluated. IBM SPSS v23 software (USA) was used for descriptive and analytical statistics (Mann-Whitney, Kruskal-Wallis and Chi square tests).

**Results.** The median age of study group was 70.0 years (IQR 61.0–76.0). There were 52.6% [95% confidence interval: 47.4–58.1] females and 47.4% [41.9–52.6] males. Distribution of primary tumour based on location was as follows: left side 43.7% [38.5–49.2], rectum 28.4% [23.2–33.3] and right side 27.8% [23.2–32.7]. Number of lymph nodes retrieved during operation and gender was statistically significantly associated with PTL ( $p = 0,001$  and  $0,008$ ). Association between biggest size of tumour, status of resection lines and intraarterial invasion and PTL also was observed ( $p = 0,003$ ,  $p = 0,014$  and  $p = 0,027$  respectively). No association between PTL and pT, pN, M, invasion markers was discovered.

**Conclusion.** In our study group left side located tumours predominated. Furthermore, left side location was more frequent in females, was associated with smaller size and had less frequent intraarterial invasion. Additional studies are needed to evaluate PTL as a prognostic factor in Latvian population.

## THE IMPACT OF BODY MASS INDEX ON RENAL TRANSPLANTATION OUTCOME

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**Keywords.** Body mass index, graft function, serum creatinine level, glomerular filtration rate, complications.

**Objectives.** Nowadays, excessive bodyweight amongst the population is a serious problem in many countries. Increased body mass may promote development of some pathological conditions which has a negative impact to men's health. Thus, it may be assumed that excessive bodyweight may have an impact on kidney transplantation results. The aim of our study is to evaluate increased body mass index (BMI) impact on the renal transplantation results.

**Materials and methods.** We analyzed kidney transplant recipients, who underwent kidney transplantation in the Latvian Transplantation Center between 01.01.2015 to 31.12.2016. All patients were divided into two groups: patients, whom BMI was less than 30 kg/m<sup>2</sup> (group A) and patients, whom BMI exceeded 30 kg/m<sup>2</sup> (group B). These groups were compared by serum creatinine (SrCr) level and glomerular filtration rate (GFR) one month and then one year after transplantation and one year patients and graft survival. For data analysis we used Mann-Whitney U and Chi-Square tests.

**Results.** Altogether 85 recipients were analyzed: group A - 71 patients and group B - 14 patients. Group comparison showed that patients with BMI less than 30 kg/m<sup>2</sup> had a noticeable lower SrCr level ( $p < 0.05$ ) and higher GFR both one month and one year after transplantation, compared with patients from group B. There were no differences in one year graft and patients survival between both groups.

**Conclusion.** Our study results showed that excessive bodyweight negative impact kidney transplantation results.

## PROSPECTIVE ANALYSIS OF PRIMARY SPONTANEOUS PNEUMOTHORAX

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**Keywords.** Primary spontaneous pneumothorax, chest tube, recurrence rate, smoking.

**Objectives.** Primary spontaneous pneumothorax (PSP) is a significant health problem. It has an age-adjusted incidence of 7.4 to 18 cases per 100000 population per year. PSP presents with acute onset ipsilateral chest pain and dyspnoea. Therapeutic PSP treatment options include oxygen supplementation, manual aspiration, chest tube drainage, thoracoscopic and surgical interventions. The aims of the study was to assess the impact of epidemiological factors on primary spontaneous pneumothorax development and to estimate the connection between drainage time duration and lung relapse rate.

**Materials and methods.** A 2-year prospective analysis of 50 patients, who experienced initial primary spontaneous pneumothorax was made. Patients were randomised into 2 categories (A and B), according to the chest tube removal time. Groups were compared according to the frequency of the recurrence of the PSP. Statistical analyses were performed by using Microsoft Office Excel, SPSS software.

**Results.** Study included 39 men and 11 women, mean age  $29.4 \pm 8.14$  years. 49 episodes of PSP were unilateral (26 left sided, 23 right sided). The main symptoms were breathlessness (84.0%), chest pain (78.0%). 66% of the subjects had history of tobacco use, average pack-years 8.2. Average length of stay was 7.7 days. Statistically significant correlation was not found comparing groups by age, gender and tobacco smoking. There was no significant difference between the length of hospitalisation in different groups. 4 patients had lung relapse in group A and 1 in group B. No correlation was found comparing recurrences with chest tube removal time. Follow up time varies from 1 month to 3 years.

**Conclusion.** Primary spontaneous pneumothorax (PSP) is a significant health problem with poorly investigated pathophysiological occurrence. Owing to the fact that PSP has strictly defined risk factors and symptoms, it should be included in every case of chest pain differential diagnosis.

## COMPLICATIONS AFTER PULMONARY RESECTIONS

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**Keywords.** Pulmonary resections, surgical treatment, complications.

**Objectives.** Patients undergoing thoracotomy associated with lung resection are thought to be at high risk for the development of postoperative pulmonary complications during the perioperative period, and these complications may lead to serious morbidity. Despite advances in surgical technique, anesthesia, and perioperative care, mortality ranges from 2 to 12%. Our aim was to analyze all anatomical pulmonary resections in VULSK Thoracic surgery department from 2013 to 2018, compare complication rates with the literature analysis also compare anatomical resections and VATS complications.

**Materials and methods.** All patients undergoing anatomical lung resection surgery were reviewed. Data collection based on medical documentation retrospectively.

**Results.** 256 anatomical lung resection operations were performed. The average age of patients is 58.9 years. 74% of the operations were due to primary lung cancer. The majority of the operations consisted of lobectomies. More than 90% of surgeries were conducted in an "open chest" manner. 35.5% of open chest surgeries were complicated. The main complication was bleeding, which was 7% and was the leading cause of death. VATS operations accounted for less than 10%. A 26.3% complication rate was observed, and the main complication was air drainage.

**Conclusion.** The frequency of complications does not differ significantly from literature research data. Postoperative bleeding was the most common complication.

## CORRELATION BETWEEN MITOTIC AND APOPTOTIC INDEX AND PARAMETERS OF TNM CLASSIFICATION IN PRIMARY LUNG ADENOCARCINOMA AND SQUAMOUS CELL CARCINOMA

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**Keywords.** Adenocarcinoma, apoptosis, lung, mitosis, squamous carcinoma.

**Objectives.** Mitotic (MI) and apoptotic (AI) index are accessible parameters in case of biopsy or resection in many tumours. The aim of the study was to determine and evaluate the correlation between both indices and parameters of TNM classification in primary lung squamous cell carcinoma and adenocarcinoma to evaluate if they could serve as early predictive and diagnostic markers.

**Materials and methods.** The retrospective study comprised 69 primary lung carcinomas, including 33 squamous cell carcinomas and 36 adenocarcinomas. The haematoxylin eosin stained slides from operation material were re-evaluated by the researchers. The histological type, T, N and tumour grade (G) parameters were detected and reclassified according to World Health Organization and TNM classifications 2017. MI and AI were calculated using the mean values counted in 5 high-power fields per specimen comprised of 100 tumour cells each. Statistic data analysis was performed using SPSS, including Spearman's correlation.

**Results.** Correlations were found between MI and cancer histological type ( $r = 0.562$ ,  $p = 0.000$ ) as well as between MI and T parameter ( $r = 0.257$ ,  $p = 0.049$ ). AI also correlated with histological type ( $r = 0.265$ ,  $p = 0.032$ ) and with tumour grade G ( $r = 0.265$ ,  $p = 0.032$ ). Further findings were found between T parameter and grade G ( $r = 0.324$ ,  $p = 0.008$ ) and specifically for adenocarcinoma a correlation between MI and G ( $r = 0.508$ ,  $p = 0.002$ ).

**Conclusion.** Since higher T parameter was represented by higher MI, the latter could serve as predictive marker for T. Analogously AI could serve as marker for tumour grade (G). Since the clear link between both indices and clinical findings, their use as additional independent diagnostic marker could be considered.

## ASSESSMENT OF RISK FACTORS FOR POOR BOWEL FUNCTION SUBSEQUENT TO LOW ANTERIOR RECTAL RESECTION FOR LOWER RECTAL CANCER

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**Objectives.** The aim was to determine the risk factors in patients for having a higher LARS score after anterior rectal excision for lower rectal cancer.

**Materials and methods.** Data was collected retrospectively of patients who were surgically treated for lower rectal cancer in National Cancer institute, between 2007 and 2012. From January to May of 2018 the patients were contacted by phone and a questionnaire was filled out in order to assess the presence and severity of low anterior resection syndrome (LARS). Possible risk factors were evaluated, such as age during operation, gender, preoperative radiochemotherapy, and rectal tumour height and their influence on total LARS score in patients.

**Results.** 92 patients underwent surgical treatment for rectal cancer at the National Cancer Institute in Vilnius. However, only 67 patients were included in the analysis due to the exclusion criteria: death (6 patients), stoma (3 patients), no available contact (3 patients), rejection of questionnaire (7 patients). Among this group, 34 were men and 33 were women. The median age during operation was 62 years, and the average time of follow-up in the responders was 7.5 years. Overall, major LARS was experienced by 17 (25.37%) patients, while 13 (19.40%) had minor LARS and 37 (55.23%) reported no LARS. Analysis of risk factors revealed that age during operation (>55 years) ( $p = 0.018$ ,  $N = 54$ ) and preoperative radiochemotherapy ( $N = 13$ ,  $p = 0.026$ ) were the only statistically significant risk factors.

**Conclusion.** Old age and preoperative chemotherapy are major risk factors for poor bowel function outcomes after surgical rectal cancer treatment.

## CORRELATION BETWEEN SMOKING PACK-YEARS AND RESPONSE TO FIRST-LINE CHEMOTHERAPY REGIMEN USING RECIST CRITERIA IN NON- SMALL LUNG CANCER PATIENTS

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**Keywords.** Non-small cell lung cancer, RECIST criteria, smoking, chemotherapy.

**Objectives.** Cigarette smoking is a well-established cause of lung and many other types of cancer, including cancers of the oral cavity, esophagus, stomach etc. The aim of the current study was to prove the correlation between years of smoking and evaluation of response to first-line chemotherapy regimen using Response Evaluation Criteria in Solid Tumors (RECIST) criteria in non-small cell lung cancer patients.

**Materials and methods.** Altogether 79 patients were enrolled in the retrospective and descriptive study. Patients' data were taken from oncological council reports of patients with stage IV non-small cell lung cancer (NSCLC) who received only palliative chemotherapy. Patient smoking pack-years were calculated and response to first-line chemotherapy was evaluated comparing findings in CT before the treatment and after finishing chemotherapy. Data were conducted from January 2016 to March 2018.

**Results.** From 79 patients 26 (32.9%) were smokers and mean smoking pack-years were 40.6 years (min = 15, max = 53). The average age of the patients were 68.3 years  $\pm$  8.5 (max = 80, min = 52) years. 3 (11.5%) were women, 23 (88.5%) were men. Most common histological variant was adenocarcinoma (11 patients (42.3%) and squamous cell carcinoma (11 patients (42.3%). After analyzing CT imaging data with RECIST criteria to evaluate the effectiveness of first-line chemotherapy, 12 (46.2%) patients had progression, 4 (15.4%) had stable disease, 9 (34.6%) had partial remission, 1 (3.8%) had complete remission. A Spearman's rank-order correlation was run to determine the relationship between smoking pack-years and response to first-line chemotherapy. There was a weak, positive correlation which was not statistically significant ( $r_s = 0.20$ ,  $p = 0.328$ ).

**Conclusion.** Almost half (46.2%) of the patients with past or current smoking history had progressive disease. No strong correlation was proven comparing smoking pack-years and effectiveness of first-line chemotherapy treatment using RECIST criteria.

## POSSIBLE PROGNOSTIC GENETIC MARKERS IN ACUTE MYELOID LEUKEMIA PATIENTS WITH FLT3 AND PML-RARA MUTATIONS

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**Keywords.** Acute myeloid leukemia, acute promyelocytic leukemia, genetic markers, FLT3, PML-RARA.

**Objectives.** Acute myeloid leukemia (AML) is the most common type of acute leukemia in adults. Survival rates for this disease are the lowest among all adult leukemia patients. Various genetic mutations and translocations, such as the FLT3 gene mutation and PML-RARA translocation (acute promyelocytic leukemia (APL)) are found in many cases. In the present study, we aimed to assess the possible prognostic markers in AML patients with FLT3 and PML-RARA mutations at the stages of diagnosis, treatment and remission.

**Materials and methods.** We examined samples from 11 AML patients with PML-RARA and FLT3 mutations. The expression of 28 genes related to proliferation, differentiation and epigenetic regulation, was examined by using RT-qPCR after treatment *in vivo* and *ex vivo*.

**Results.** We demonstrated that in all patients who reached remission, the expression of genes related to cell cycle regulation (P53, P21) increased and the expression of oncogenes (MYC, WT1) decreased, suggesting normalized cell proliferation. We estimated that in blasts of PML-RARA patient, genes ATM (G1/S cell cycle arrest regulator), CEBPE and PPARG (both responsible for cell differentiation) expression increased while TERT (maintains telomere ends) expression decreased. In patients with FLT3 mutation, we observed significant expression changes of genes involved in epigenetic regulation (KAT6A, KDM6B, GATAD2A).

**Conclusion.** We suggest that expression analysis of cell cycle related genes (ATM, P53, P21), oncogenes (MYC, WT1, TERT), cell differentiation related genes (CEBPE and PPARG) and epigenetic regulators' genes (KAT6A, KDM6B, GATAD2A) might be promising for observing AML patient disease treatment and prognosis.

## THE EXPRESSION OF CLAUDIN-4 IN GASTRIC CANCER TISSUE

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**Keywords.** Claudin-4, gastric cancer.

**Objectives.** Claudin-4 is an integral membrane protein, which belongs to the claudin family. The protein is a component of tight junction. Regarding its function, different effects have been observed depending on the cell model. It can play an important role in creating a regular barrier, regulating a permeability of water and ions, and forming ion channels. Dysfunction of tight junction and differences in expression of Claudin-4 are often correlated with carcinogenesis. Therefore the aim of the study was to evaluate the expression of Claudin-4 in gastric cancer tissue and to assess the correlation between presence of this protein and clinicopathological parameters of gastric cancer.

**Materials and methods.** The study consisted of 85 patients with gastric cancer who underwent radical gastrectomy. Claudin-4 expression was evaluated in formalin-fixed and paraffin-embedded cancer tissues. The immunostaining reactions were defined as: absent (0-5% positive cells); weak (6-25% positive cells); medium (26-50% positive cells); strong (51-75% positive cells); very strong (76-100% positive cells). The Claudin-4 expression was correlated with patient's age, gender, tumor size, tumor location, grade and histological subtype, depth of invasion, lymphatic and venous invasion, lymph node metastases, distant metastases and *H. pylori* infection.

**Results.** Expression of Claudin-4 protein was absent in 4.7% cases, weak in 23.5%, medium in 17.7%, strong in 20% and very strong in 34.1% cases. Statistical analysis showed that higher expression of Claudin-4 was associated with well differentiated gastric cancers ( $p = 0.029$ ). In addition, the correlation was observed between presence of protein and histological type of cancer. Positive reaction of Claudin-4 was more often in non-mucinous subtype of adenocarcinoma ( $p = 0.034$ ). Lower expression of Claudin-4 was positively correlated with lymphatic invasion ( $p = 0.008$ ) and distant metastases ( $p = 0.027$ ).

**Conclusion.** Increased Claudin-4 expression is associated with favourable clinicopathological factors of gastric cancer. Decreased expression may indicate advanced stage of cancer and metastases.

## DIAGNOSTIC VALUE OF NEUTROPHIL-TO-LYMPHOCYTE RATION AND PLATELET-TO-LYMPHOCYTE RATIO IN GASTRIC ADENOCARCINOMA PATIENTS BEFORE SURGICAL THERAPY

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**Keywords.** NLR, PLR, gastric cancer.

**Objectives.** Gastric adenocarcinoma is the most common gastric malignant tumour and is the fifth most common malignant tumour globally amongst both genders at age 65 and older. Although the main test used to evaluate gastric cancer development is esophagogastroduodenoscopy (EGD) and radiologic imaging (MR, CT) in high-risk and symptomatic patients, mortality is still high and these diagnostic methods do not correlate with stage. The aim of this research is to assess whether NLR and PLR are suitable for evaluating diagnostics of gastric adenocarcinoma in patients before surgical stomach excision and can be

**Materials and methods.** 100 patients of P.Stradiņš Clinical University Hospital diagnosed with gastric adenocarcinoma who underwent radical surgical therapy from 2010 to 2017. PLR and NLR were calculated before and after surgical treatment. Statistical analysis for correlation based on tumor stage was performed.

**Results.** In 100 patients with average age of 66 diagnosed with gastric adenocarcinoma Stage I patients amount to 21,2%, Stage II - 27,6%, Stage III - 46,8% and Stage IV - 4,4%. Average ratios before surgical treatment for Stage I - NLR 2,81 and PLR 159,34; Stage II - NLR 3,62 and PLR 249,96; Stage III - NLR 3,57 and PLR 217,07; Stage IV - NLR 4,03 and PLR 276,56. However, if applied from 25th to 75th percentile, the results are following: Stage I - NLR 2,18 and PLR 133,38; Stage II - NLR 2,66 and PLR 182,34; Stage III - NLR 3,17 and PLR 202,65; Stage IV - NLR 3,47 and PLR 272,44.

**Conclusion.** NLR and PLR grow in correlation with gastric adenocarcinoma stage in 25th to 75th percentile before surgical therapy. Evaluating these ratios may help specify stage of disease and prevent false diagnosis and therefore adapt the therapy accordingly.

## THE RELATION OF PROSTATE CANCER RISK GROUPS ON QUALITY OF LIFE AFTER CYBERKNIFE RADIOSURGERY TREATMENT

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**Keywords.** Radiosurgery, prostate cancer.

**Objectives.** Prostate cancer (pCa) is a leading cause of mortality and morbidity globally. Quality of life (QoL) is an important concern for patients when they are choosing treatment modality (Chen et al. 2018). EUA guidelines identifies 3 groups for pCa relapse-Low Risk (LR), Intermediate Risk (IR) and High Risk (HR). The aim of the study was to evaluate relationship between pCa risk groups and patients QoL after treatment using standardized questionnaire Expanded Prostate Cancer Index Composite (EPIC).

**Materials and methods.** We enrolled 54 patients with primary pCa who underwent fractionated radiosurgery (fRS) with CyberKnife M6 system from June 2016-June 2018. All patients completed the EPIC questionnaire to evaluate urinary, bowel, and sexual QoL before and every 3 months after treatment. The descriptive and analytical statistics was conducted with SPSS. P values < 0.05 were considered significant.

**Results.** The mean age of the study group at enrollment time was 65.5[95% CI: 63.5-67.8]. Most of the patients were identified in the HR group 37% [24.4-50]. There were statistically significant changes of QoL after fRS in EPIC urinary and bowel domains ( $p = 0.012$ ;  $p = 0.042$ ) in LR group. Also, in LR group, age of patients showed correlation with changes of sexual ( $r = -0.52$ ;  $p = 0.014$ ) and gastrointestinal function ( $r = -0.43$ ;  $p = 0.047$ ) after fRS. However, in IR group age correlated only with QoL in sexual domain ( $r = 0.43$ ;  $p = 0.02$ ).

**Conclusion.** The study revealed a statistical interaction in the LR group, with changes in urinary and bowel functions QoL after fRS. There is significant correlation between age and QoL factors for LR and IR patients. HR group showed no effect or correlation for all QoL domains. Further analysis would be necessary to evaluate other factors on QoL after fRS such as prostate volume and dose on critical structures etc.

## EPIDEMIOLOGICAL TRENDS AND CHARACTERISTICS OF INTESTINAL NEUROENDOCRINE NEOPLASMS: RESULTS FROM TWO TERTIARY REFERRAL HOSPITALS

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**Keywords.** Gastroenteropancreatic, intestine, neuroendocrine neoplasm, epidemiology, characteristics.

**Objectives.** Intestinal neuroendocrine neoplasms (i-NEN), a subgroup of gastroenteropancreatic NEN (GEP-NEN), are malignancies with distinct functional and biological behavior. Although the incidence of NEN has increased significantly over the past decades, understanding the pathology is heavily based on national experience.

The objectives were to analyze the epidemiology and tumor characteristics of patients with i-NEN in two tertiary referral hospitals, update statistics and continue researching GEP-NEN.

**Materials and methods.** Eighty-three patients with histopathologically confirmed i-NEN diagnosed and/or treated in two tertiary referral hospitals between 2008 and 2018 were gathered by retrospective and prospective analysis of data in the EUROCRINE database and included in the study. Epidemiological data, clinicopathological characteristics, diagnostic and treatment variables were analyzed.

**Results.** Male to female ratio was 1:2.5 (24/59; average age: 59.5 ± 16.4 years). The most frequent primary site was the small intestine (33.7%), followed by the large intestine (22.9%), appendix (16.9%), duodenum (14.5%) and rectum (12%). In the last four years the number of patients with i-NEN has increased by 13.2% compared to almost twice the study period prior. 78.5% of tumors were hormonally non-functional and the most common symptom was abdominal pain (54.4%). CT-scan was the diagnostic method of choice in 53%. 80.7% of patients underwent an operation with curative intent. Evaluation of biopsy and postoperative material determined most tumors to be ≤3 cm in diameter (61.8%), localized (40%) and well-differentiated (83.6%). Oncologic treatment- chemotherapy or biological targeted therapy- was indicated in 43.1%. At the time of analysis 19 tumor related deaths were documented, corresponding to 22.9% of the cohort.

**Conclusion.** Histopathological analysis in accordance with guidelines, and standardized diagnostic, treatment and follow-up data entry should be established. Creation of a nationwide NEN patient registry is mandatory in the future. Targeted input of GEP-NEN patients results in higher rates of cases annually.

## BREAST CANCER: THE USE OF PREDICTIVE RISK MODELS AMONGST LATVIAN GENERAL PRACTITIONERS FOR RISK ASSESSMENT

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**Keywords.** Breast cancer, risk assessment.

**Objectives.** The incidence of breast cancer has risen over the last two decades in Latvia by 1.6% annually. A form of risk assessment is with mathematical risk models which have been around for the last 30 years, e.g. Gail model which assists in working out absolute 5-year and lifetime risk of developing breast cancer. Other models such as Claus, BOADICEA, BRCAPRO and IBIS also exist. They have been modified and tailored to even identify possible BRCA 1/2 mutation carriers. The aim was to determine whether risk models for breast cancer are used by Latvian GPs.

**Materials and methods.** A prospective study with a questionnaire that enquired use, knowledge or unfamiliarity with the models and factors which influenced its use. Data was analysed using SPSS.

**Results.** 54 responses were collected whereby the following percentage of users were observed for the models: Gail 2-17.4%, BOADICEA -5.9%, BRCAPRO -1.9%, IBIS- 3.8%. Claus had no users. For Gail 2 users, one way ANOVA showed mean of age differed significantly  $F(2;50) = 5.697$ ,  $p = 0.006$ ; Games-Howell Post Hoc was then used and it showed a difference in mean age between users and unfamiliar respondents ( $p = 0.001$ ). A difference in mean age was also seen between respondents being aware and who's unfamiliar with models ( $p = 0.028$ ). Regarding influencing factors, 33.3% thought national guidelines promote model use, 40.7% viewed calibration was incorrect for Latvian population and 53.7% recommended its use in combination with genetic testing for analysing breast cancer risk.

**Conclusion.** Predictive risk models are in use, but the extent of usage cannot be evaluated with the current sample size. The familiarity and use of models is significant in younger GPs, in comparison with experienced physicians. Knowledge and reliability appear as limiting factors.

## MODERN TREATMENT OPTIONS OF CNS LYMPHOMA IN PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Primary central nervous system lymphoma methotrexate, radiation, treatment

**Objectives.** Primary central nervous system lymphoma (PCNSL) is a rare CNS neoplasm. It occurs only in 3% of all primary CNS tumors. Radiation has historically been standard treatment of PCNSL. Methotrexate systemic in high doses is most effective treatment and chemotherapeutic agent for primary CNS lymphoma nowadays. It improves quality of life and survival. Since 2018, Clinic of Oncology Pauls Stradiņš Clinical University Hospital has started a new treatment protocol with high doses methotrexate systemic chemotherapy.

The aim of this study is to ascertain treatment differences and outcomes between patients who received high-dose methotrexate systemic chemotherapy alone and patients who received radiation therapy combined with intrathecal methotrexate chemotherapy.

**Materials and methods.** Descriptive retrospective study of PCNSL patients who were admitted to Clinic of Oncology Pauls Stradiņš Clinical University Hospital in Latvia from March, 2011 to July, 2018. Data on episodes were obtained from the Clinic of Oncology Pauls Stradiņš Clinical University Hospital health records. Relapse – free survival as well as treatment side effects were used to compare different treatment protocols.

**Results.** The analysis included 9 PCNSL patients in which of the following 2 received new treatment protocol – high-dose methotrexate systemic chemotherapy alone.

Patients who received high-dose methotrexate systemic chemotherapy better tolerated treatment and less side effects were observed as well as long-term relapse-free survival has been observed.

**Conclusion.** We noted faster recovery and better life quality during and after treatment for patients which received high-dose methotrexate systemic chemotherapy alone in the population of PCNSL patients in Institute of Oncology Pauls Stradiņš Clinical University Hospital in Latvia, 2011–2018.

## NEOADJUVANT CHEMORADIO THERAPY IN THE DOWNSTAGING OF LOCALLY ADVANCED RECTAL CANCER AND ITS IMPACT ON PROGRESSION-FREE SURVIVAL

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**Keywords.** Locally advanced rectal cancer, neoadjuvant chemoradiotherapy, downstaging.

**Objectives.** The standard treatment for locally advanced rectal cancer (LARC) is neoadjuvant chemoradiotherapy (NACRT) followed by radical surgery with total mesorectal excision, which allows to reduce local recurrence, downsize the tumor and facilitate its R0 resection. The objectives of this study were to evaluate the downstaging of LARC after NACRT and to assess the impact of downstaging on 3-year progression-free survival (3yPFS).

**Materials and methods.** 65 patients diagnosed with LARC from 2012 to 2018, who received NACRT with subsequent radical surgery after a mean interval of 11,5 weeks were identified in the Pauls Stradins Clinical University Hospital in Riga and included in this retrospective study. Average follow-up period was 31 months. Data were analyzed with SPSS Statistics 22.0, Wilcoxon signed-rank test and Kaplan-Meier survival analysis were performed.

**Results.** Overall, 67 % (n = 40) of patients experienced a downstaging in response to NACRT, of which 38 % (n = 24, p = 0.004) had a downstaging of T and 63 % (n = 38, p = 0.0001) of N.

3yPFS was 63%. 3yPFS of patients treated with IV 5FU/LV was significantly higher (77%) than those who received oral Tegafur (45,6%, median PFS 32 months), p = 0.038. 3yPFS of patients with downstaged T was 86%, compared to 52% without it; mPFS not met, p = 0.04. 3yPFS of patients with downstaged N was 72%, compared to 43% without it (mPFS 24 months), p = 0.112. 3yPFS of patients with lymphatic invasion was 49% (mPFS 16 months), compared to 83% without it, p = 0.0001; regarding vascular invasion, 3yPFD was 56%, compared to 77% without it; mPFS not met, p = 0.014. Age at diagnosis, tumor location, grade, type of surgery, adjuvant chemotherapy and perineural invasion did not have a significant impact on PFS.

**Conclusion.** Results confirm the efficacy of NACRT in LARC in the downstaging of T and N. Downstaging of LARC is associated with significantly increased 3yPFS.

## SINGLE CENTRE STUDY: SURVIVAL OF PATIENTS WITH INITIALLY UNRESECTABLE STAGE III GASTRIC ADENOCARCINOMA AFTER RECEIVING NEOADJUVANT CHEMOTHERAPY

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**Keywords.** Gastric cancer, unresectable, neoadjuvant chemotherapy.

**Objectives.** Unresectable locally advanced gastric cancer (AGC) is quite specific group of patients, where neoadjuvant chemotherapy may shrink tumour making it surgically resectable. Unfortunately, not all of them become resectable. The aim of study was to ascertain median overall survival (OS) in patients with unresectable locally AGC and to compare median OS between patients, who received surgical resection after neoadjuvant chemotherapy and who did not.

**Materials and methods.** Only 26 patients of Oncology Centre of Latvia were suitable for study, diagnosed between 01.09.2014. and 06.09.2018. Retrospectively the clinical records were reviewed. Data were analysed by IBM SPSS. For survival analysis, Kaplan-Meier estimate was used (p calculated by log rank test, where  $p < 0.05$  considered as statistically significant difference).

**Results.** The study included 26 patients age of  $60.23 \pm 10.50$  (mean  $\pm$  SD) years (5 female, 21 male). 16 patients had exitus letalis until the end of follow up period. Most of the patients initially had stage IIIC (20 patients) gastric cancer. Most of patients (19) received DCF regimen. 17 patients reached tumour shrinkage and surgery. After surgery and pathohistological investigation, 4 out of 17 patients had stage IIIC gastric cancer, but 7 patients IIIB, 2 patients IIIA, 1 patient IIB and 3 patients IIA gastric cancer.

Median OS of the study group was 60 weeks (95% CI: 46 – 74). There was statistically significant difference ( $p < 0.001$ ) between median OS in patients, who received surgery following neoadjuvant chemotherapy and who did not receive the surgery (86 weeks (95% CI not shown) vs. 52 weeks (95% CI: 18 – 86), respectively).

**Conclusion.** According to this small study group, most of the patients reached tumour downstaging and surgery after neoadjuvant chemotherapy and their median OS was superior, if compared to patients, whom surgery was not performed.

## LOCALISATION AND SPECTRAL CHARACTERISTICS OF NOVEL BENZATHRONE PROBES IN NORMAL AND CANCER CELLS

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**Keywords.** Fluorescence benzathrone dyes, fibroblasts, melanoma.

**Objectives.** Benzathrone probes are fluorescent chemical substances that are synthesised at Daugavpils University. These probes have been shown to possess affinity for lymphocyte membranes, however, their distribution throughout the cell is not known. The aim of this study was to compare the localisation and spectral characteristics of four benzathrone probes (ABM, AM423, AM2223, P9) in different cell types.

**Materials and methods.** Normal skin fibroblasts (Hs-68) and melanoma cells (Sk-Mel28) were grown in culture. Cells were stained with benzathrone probes by adding 19.6 µmol/l of probe directly to the culture medium. Scanning confocal microscopy under 63x magnification was used both for obtaining cell pictures and dye spectral measurements. Dye spectral characteristics were analysed at the whole cell and different cellular compartment levels using LAS X platform for Leica microscopes.

**Results.** All analysed probes have similar distribution within the cell. They were localised in cell membrane and in the cytoplasm of the cell. In fibroblast, the maximum fluorescence intensity (FI) for P9 probe was at 600nm, while other probes showed maximum FI at 620nm. In melanoma cells, the maximum FI for P9, AM423 and AM2223 probes remained the same as in fibroblasts, whereas for ABM probe the maximum FI shifted to the 600nm. The analyses of spectral parameters of probes at the level of different cellular compartments showed that for the shift of maximum FI for ABM probe are responsible spectral changes in the plasma membrane of melanoma cells.

**Conclusion.** All four analysed probes are non-toxic to cells. The localisation of the probes in the cells is also similar as well as spectral characteristics, except for probe P9. However, only the ABM probe showed differences in their spectral characteristics between fibroblasts and melanoma cells and might be used as a diagnostic tool in future researches differentiating normal and malignant cells.

## MORPHOLOGICAL COMPARATIVE ANALYSIS OF PATIENTS IMMUNE-CELL COUNT CONTRASTED TO INVASIVENESS IN COLORECTAL CANCER

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**Keywords.** Colorectal cancer, adenocarcinoma, invasiveness.

**Objectives.** Prior evidence suggests that immune system contributes to cancer pathogenesis: through immunoediting and by inflammation [Schreiber et al., 2011]. In regard of colorectal cancer (CRC), inflammatory infiltrate in tumor samples has been associated with improved prognosis [Väyrynen et al., 2016]. The aim was to find a link between local tissue immune response and morphological signs in colorectal cancer cases.

**Materials and methods.** This retrospective research included 88 CRC cases, slides were stained with haematoxylin and eosin. The tumor type and spread were categorized by using WHO Classification [Hamilton, Aaltonen et al., 2000]. Neutrophils (NEU), eosinophils (EO) and lymphocytes (LY) were quantitatively evaluated in 5 high-power vision-fields(HPF) from peritumorous tissue. Statistical analysis was done with IBM SPSS Statistics 22. Results were statistically significant, if  $p < 0.05$ .

**Results.** From all 88 CRC cases, 88.6% of which were adenocarcinomas. Metastasis in lymph nodes (pN+) was observed in 52.3% of cases. Median count of NEU was 4.00 [Interquartile-range(IQR): 2.45-6.00] in HPF, EO 2.50 [IQR: 1.25-4.40] and LY 41.30 [IQR: 31.45-54.20]. There was positive correlation between NEU and pN ( $p = 0.046$ ); the median-count in case of pN0 was 4.80 per slide, in case of pN1 it was 3.20 and 3.40 in pN2.

Positive correlation was found between NEU count and tumor invasion in lymph vessels ( $p = 0.018$ ,  $U = 592.000$ ), ranging from NEU median-count 3.80 [IQR:2.00-5.60] in HPF in cases with lymphatic invasion compared to 5.90 [IQR:3.90-7.30] in HPF in cases without invasion. Positive correlation was found regarding invasion into veins and NEU median-count 3.40 [IQR:1.75-5.65] compared to 4.50 [IQR:3.35-7.10] in cases with no invasion ( $p = 0.049$ ,  $U = 984.000$ ).

**Conclusion.** Lower neutrophil amount in tissue is associated with tumor growth into lymph vessels and veins, which could indicate worse prognosis for patient. Potential therapeutic value of this information can be evaluated in future studies.

## MORPHOLOGY, GENETICS, RADIOLOGY

### RETROAURAL TYMPANIC CAVITY APPROACH

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**Keywords.** Tympanic cavity, retro-aural approach, diminished damage.

**Objectives.** A typical method in accessing the tympanic cavity would be complete mastoidectomy, however we will look into a less invasive technique. In this case the geometrical features of the temporal bone must be taken into account.

The aim of the work was to practically assess the feasibility of replacing mastoidectomy with less invasive technique and to measure the distance and angle from multiple points of entry (on the outer surface of the cranium) to the tympanic cavity.

**Materials and methods.** Firstly, the cerebrum and the adhering structures were removed from the cranium. The tympanic cavity was located on the temporal bone. Tegmen tympani was removed and the ossicles were extracted, thus securing an appropriate field of vision of the tympanic cavity. To secure more precise measurements the soft tissue in the retroaural space was dissected. Multiple point of entry holes were drilled into the tympanic cavity, their depth was measured by marking the length of the drill bit inside the hole. A hole perpendicular to the temporal bone was drilled into the tympanic cavity and its depth measured to evaluate the angle of the point of entry holes in reference to the temporal bone.

**Results.** This method was absolutely successful in accessing the tympanic cavity- the point of entry holes were within the temporal bone, thus would not cause damage to the surrounding cranial structures. The angle from the point of entry to the perpendicular hole was in the  $26^{\circ} - 36^{\circ} \pm 3^{\circ}$  range. The distance from the perpendicular hole to the point of entry hole was in the  $3.3 - 3.9 \pm 0.4$  cm range.

**Conclusion.** This method of accessing the tympanic cavity could be successfully implemented in the surgical practice as an alternative to complete mastoidectomy, however imaging techniques ought to be used such as the MRI in order to choose the appropriate path to avoid cerebral structure damage.

## EVALUATION OF EGFR, KI-67, NF-KB, MA-1 IN CLEFT AFFECTED TISSUE OF SOFT PALATE

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**Keywords.** Cleft Lip Palate, growth factors, proliferation marker, inflammatory factors

**Objectives.** Cleft Lip/ Palate (CLP) is among the most common congenital craniofacial anomalies observed worldwide. Aim of the study was the research of CLP affected soft palate with distributive analysis of Epidermal Growth Factor Receptor (EGFR), Ki-67, NF-κB, Macrophage activating factor 1 (Ma-1).

**Materials and methods.** Soft palate tissue of 8 CLP patients, aged from 3 to 36 months, were obtained during plastic surgery. Control group (CG) (6 to 15 years) encompassed 7 soft tissue samples. Hematoxylin and Eosin staining and immunohistochemistry for EGFR, NF-κB, Ki-67, Ma-1 was proceeded. Results were evaluated semi-quantitatively.

**Results.** Palate displayed inflammatory infiltrate, invaginations of epithelium with basal cell proliferation and thickened basement membrane.

EGFR immunoreactive epitheliocytes in CLP specimens ranged from few (+) to numerous (+++), with statistically significant correlation to Ki-67 ( $r_s = 0.943$ ;  $p < 0.05$ ) and NF-κB ( $r_s = 0.912$ ;  $p < 0.05$ ). Lower numbers in CG from no (0) to moderate (++) positive cells, showed statistical significance to CLP group ( $p = 0.032$ ).

Ki-67 displayed moderate (++) number of positive cells, with sporadic patchy distribution, limitation towards basal epithelium and statistically significant correlation to NF-κB ( $r_s = 0.794$ ;  $p < 0.05$ ). Occasional (0/+) to few (+) Ki-67 positive cells observed in CG. Few (+) to moderate (++) Ma-1 positive structures were noted in CLP specimen. CG showed mainly occasional (0/+) immunoreactive structures with statistical significance to CLP group ( $p = 0.01$ ). NF-κB demonstrated continuous number of positive structures (few (+) to moderate (++)), with stained intraepithelial cells and subepithelial inflammatory infiltrate. CG showed presence of few (+) positive structures.

**Conclusion.** CLP affected palate shows variations of epithelium basal part probably due to tissue phenotype modification with involvement of epithelial growth inducer EGFR and proliferation marker Ki-67. Induction by inflammation proved by correlation between Ki-67 and inflammation/proliferation marker NF-κB, and pro-inflammatory macrophages activator Ma-1 also might modificate epithelium in cleft affected palate.

## CHARACTERISATION OF BLOOD VESSELS USED FOR CORONARY ARTERY BYPASS SURGERY

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**Keywords.** Vena saphena magna, coronary artery bypass surgery.

**Objectives.** Saphenous veins are commonly used as coronary artery bypass grafts. Therefore, it was important to understand the vein wall morphology used for the bypass grafts.

**Materials and methods.** Ten specimens of saphenous veins were obtained from 10 patients admitted to P.Stradins clinical university hospital Heart surgery centre for coronary artery bypass surgery and a histopathological study was conducted. The slides were processed for histological routine and immunohistochemical staining with following markers: endothelin (ET), metalloproteinase 2 (MMP2), tissue inhibitor of metalloproteinase 2 (TIMP2), transforming growth factor beta (TGF  $\beta$ ), hepatocyte growth factor (HGF), vascular endothelial growth factor (VEGF), protein gene product 9.5 (PGP 9.5), vascular cell adhesion molecule (VCAM), intercellular adhesion molecule (ICAM). For the analysis of the positive structures detected by immunohistochemistry, a semiquantitative evaluation method was used.

**Results.** Normal histoarchitecture of the vein wall was evaluated in routine staining. Moderate positive endothelin containing endothelial cells and moderate to numerous positive VEGF cells were found on small blood vessels. Moderate positive MMP2 structures and variable – mainly moderate to numerous positive TIMP structures were found in vein wall. Positive structures were evaluated as equal with both MMP2 and TIMP with one exception, where MMP2 positive structures were evaluated as moderate, but TIMP positive structures as few. All specimens were rich with TGF $\beta$ , VCAM and ICAM cells. Abundance of VCAM and ICAM positive endothelial cells were also found. Few HGF positive structures were found in tunica intima and few PGP 9.5 positive nerve fibres in tunica adventitia.

**Conclusion.** Rich expression of TGF $\beta$ , VCAM, ICAM is characteristic for saphenous vein. A number of VEGF, MMP and TIMP positive cells found in saphenous vein wall indicates a presence of tissue remodelling and ischemia, while low number of HGF positive cells shows its lesser involvement in homeostasis regulation.

## CHARACTERIZATION OF APPEARANCE AND DISTRIBUTION IN DIFFERENT TISSUE FACTORS OF CLEFT LIP PALATE PRIMARY AND REPEATED SURGERIES

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**Keywords.** Cleft lip palate, PGP 9.5, caspase, IL1, BMP2/4, human b-defensin 2, Ki67, collagen 1.

**Objectives.** Orofacial clefts are characterized by a failure of fusion between adjacent facial structures in the embryo. Proliferation marker Ki67 is strongly associated with cell proliferation. PGP 9.5 is a new cytoplasmic neuron-specific protein. Collagen1 is useful for detection in bone formation. Caspase-1 functions as key components of the apoptosis. Human b-defensin 2 is typically upregulated in keratinocytes during inflammation. BMP2/4 are essential for osteoblast osteogenesis. IL1 participate in inflammatory host response to infection.

**Materials and methods.** The study included 13 bone and 9 soft tissue samples from 7 patients (aged 6 – 18 years) with cleft lip palate. Tissue was obtained from RSU AAI tissue material collection. PGP 9.5, Caspase, IL1, BMP2/4, defensin, Ki67, collagen 1, human b-defensin were detected by use of biotin-streptavidin immunohistochemistry method. The number of immunoreactive cells was evaluated semi-quantitatively.

**Results.** BMP2/4, IL1, Def2, and collagen1 showed few positive cells in bone of both-primary and continuing next osteoplastic. Ki67 and Caspase demonstrated clear difference between the surgeries with an increase of moderate value of cells in repeated surgeries in two cases with one exception when the repeatedly touched tissue demonstrated notable decrease of factor positive cells. Other factors were detected only in one of surgeries. Commonly, PGP 9.5 mainly marked the structures in epithelium followed by nerve fibers in glands and connective tissue. Def2 positive soft tissue cells varied from moderate to abundant in epithelium, but moderate in number of connective tissue and glands.

**Conclusion.** Apoptosis and proliferation of soft tissue seem to increase with the repeated surgical intervence of the tissue. Neuropeptide-containing innervation and b-defensin2 characterize mainly the epithelium. Absence of bone factor changes suggests the rigidity of tissue possibly requesting longer bone regeneration time than the soft tissue.

## IMMUNOHISTOCHEMICAL CHARACTERISTICS OF PULMONARY SQUAMOUS CELL CARCINOMA

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**Keywords.** Lung squamous cell carcinoma, small cell carcinoma, immunohistochemistry.

**Objectives.** Lung squamous cell carcinoma is diagnosed in small biopsy based on morphological characteristic like intracellular bridges, keratinization, necrosis. However many cases requires not only H&E stain but also immunohistochemistry. Poorly differentiated squamous cell carcinoma does not have any typical squamous cell architecture and can mimic small cell carcinoma. The aim of the research is to find immunohistochemistry profile that can distinguish between lung squamous cell carcinoma and small cell carcinoma.

**Materials and methods.** To achieve the goal of the research was used microscopic examination of biopsy materials with lung squamous cell carcinoma and small cell carcinoma. Reaction with immunohistochemistry markers was considered as positive or negative. The results were summarized using descriptive statistics in IBM SPSS Statistics V23.0 and Microsoft Excel.

**Results.** In this study, there were researched 20 biopsy materials, 4 with lung small cell carcinoma and 16 with lung squamous cell carcinoma. Biopsy samples were stained with 7 immunohistochemistry markers: CK5/6, p63, CKHMW, p40, CD56, p16, Chromogranin A. CK5/6 was positive in 9 cases of squamous cell carcinoma. p63 was positive in 15 cases of squamous cell carcinoma and 1 case of small cell carcinoma. CKHMW was positive in 15 cases of squamous cell carcinoma and 1 case of small cell carcinoma. p40 was positive in 12 cases of squamous cell carcinoma. CD56 was positive in 5 cases of squamous cell carcinoma and 2 cases of small cell carcinoma. p16 reacted with all biopsy samples. Chromogranin A was positive in 2 cases of squamous cell carcinoma and 2 cases of small cell carcinoma.

**Conclusion.** The most specific marker combination to distinguish between lung squamous cell carcinoma and small cell carcinoma is p63 and CKHMW. p16 was positive in all biopsy samples therefore it cannot be used as diagnostic tool for this cancer types.

## APPLICATION OF IHC MARKERS FOR DIFFERENTIAL DIAGNOSIS OF LEIOMYOMAS AND LEIOMYOSARCOMAS OF THE UTERUS

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**Keywords.** Leiomyosarcoma, leiomyoma, immunohistochemistry, markers.

**Objectives.** Leiomyosarcoma is a form of malignant tumors of the uterus (1-2%). The mortality rate is 35-41%. The new direction of research, immunohistochemistry, allows to determine the presence of receptors with the help of specific markers. The aim was to determine the IHC-reactivity of cells of leiomyomas and leiomyosarcoma, to compare the results and recommend the introduction of the practice of using the panels of IHC markers.

**Materials and methods.** Archival histological material of 20 patients treated tumors of myometrium, general histological - coloration with hematoxylinum and eosin; Immunohistochemical (IHC) - ER, PR, WT-1, P53, Ki-67, SMA; statistical.

**Results.** Investigated 10 leiomyom (L) with typical histological structure and 10 new cases leiomyosarcomas (LS). The proliferative activity of leiomyocytes in patients with LS was assessed for the level of Ki-67 expression, and was significantly increased than in L. The rate of expression of p53 was significantly higher in patients with LS than L (LS  $0.930 \pm 0.009$ ; L  $0.025 \pm 0.003$ ). The data indicate a violation of the coordination between the processes of proliferation and apoptosis.

Significant difference in sensitivity of SMA is not revealed, but was +++ in both cases. Moderate sometimes strong immunoreactivity to ER, PR was determined in patients with L, while in the majority of cases of LS were weak and made a significant difference, respectively (LS  $0.179 \pm 0.022$ , L  $0.752 \pm 0.062$ ), which suggests a decrease in receptor sensitivity to hormones in LS.

The nuclear and focal cytoplasmic sensitivity of WT-1 prevails in L in relation to LS, indicating a reduction and loss of differentiation of tumor cells.

**Conclusion.** The significant difference in the expression of IHC markers was proved in cases of leiomyoma and leiomyosarcoma of the uterus, it can be recommended for differential morphological diagnostics.

## PATTERNS OF FEMALES WEIGHT GAIN DURING PREGNANCY IN RELATION TO ANTHROPOMETRIC PARAMETERS OF NEWBORNS

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**Keywords.** Newborn, gestational weight gain, skinfolds.

**Objectives.** Gestational weight gain has significant implication to short- and long-term maternal and child health outcomes. We evaluated the relationship between the pattern of gestational weight gain and the other anthropometric parameters of newborn.

**Materials and methods.** The survey was carried out at Vilnius university Clinic of obstetrics and gynecology. In total, 101 newborns and their mothers were investigated: height, weight, 13 body circumferences of newborns were measured. Women were asked to fill in the questionnaires to capture participant specific information. Gestational weight gain (GWG) was divided into three groups: low ( $\leq 10$  kg), medium (10 – 20 kg) and high ( $\geq 20$  kg).

**Results.** In the group of mother's high GWG, the average newborn's height and weight was  $53.80 \pm 1.93$  cm and  $3845 \pm 453.32$  g respectively, in the group of medium GWG –  $53.01 \pm 2,40$  cm and  $3260 \pm 342.86$  g ( $p < 0.05$ ) respectively. Correlation was found between mother's high GWG and newborn's weight ( $r = 0.724$ ,  $p < 0.05$ ) and following newborn's body circumferences: neck ( $r = 0.738$ ,  $p < 0.05$ ), forearm ( $r = 0.757$ ,  $p < 0.05$ ), hip ( $r = 0.850$ ,  $p < 0.01$ ), calf ( $r = 0.782$ ,  $p < 0.01$ ); shoulder ( $r = 0.640$ ,  $p < 0.05$ ), chest ( $r = 0.683$ ;  $p < 0.05$ ). In the group of mother's low GWG, the average newborn's weight and height was  $3213.08 \pm 424.88$  g and  $52.46 \pm 1.85$  cm respectively. Correlation was found between mother's low GWG and newborn's weight ( $r = -0.596$ ,  $p < 0.05$ ), abdominal skinfold ( $r = -0.583$ ,  $p < 0.05$ ) and following newborn's circumferences: shoulder ( $r = -0.563$ ,  $p < 0.05$ ), forearm ( $r = -0.554$ ,  $p < 0.05$ ), chest ( $r = -0.561$ ,  $p < 0.05$ ).

**Conclusion.** The average newborn's body weight in the group of mother's high GWG was significantly higher than the average newborn's body weight of the group of medium GWG. High mother's GWG was associated with larger newborn's neck, forearm, hip, calf, shoulder and chest circumferences. Decrease of mother's GWG was associated with higher newborn's weight, bigger abdominal skinfold and larger shoulder, forearm and chest circumferences.

## ASSESSMENT OF SYNOVITIS BY KRENN PROPOSED HISTOLOGICAL SCORING SYSTEM AND ITS CORRELATION WITH THE PRESENCE OF HUMAN HERPES VIRUS 7 IN SYNOVIAL MEMBRANE

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**Keywords.** Synovial membrane inflammation, Krenn histological scoring system, HHV-7, light microscopy, immunohistochemistry.

**Objectives.** Synovitis may develop in rheumatic and nonrheumatic arthritides. HHV-7 is found in individuals diagnosed with the chronic joint disease, but a role of the virus is poorly understood. Despite all available modern instrumental and laboratory methods, accurate diagnostics of chronic arthritides still remain a major clinical burden. Grading proposed by Krenn Morawietz could contribute to a better evaluation of synovitis.

The study aimed assessment of synovitis in chronic arthritis grading severity according to Krenn. In addition, it was correlated with the expression of HHV-7 proteins in the synovial membrane.

**Materials and methods.** Synovial samples obtained from 54 HHV-7 PCR positive patients were processed routinely and immunohistochemically. The synovitis score was estimated semiquantitatively expressing data as follows: 0 – absent, 1 – weak, 2 – moderate, 3- strong. HHV-7 positive cells were estimated quantitatively. The results were analyzed using SPSS 23.0 program presenting data as medians with interquartile range (IQR (25%; 75 %).

**Results.** Synovitis score ranged from 0 up to 9 revealing mean value 3.2 (SD 2.4) and median value 3 (IQR 1; 5). HHV-7 expression was observed in sublining lymphocytes, plasmocytes, macrophages, and endotheliocytes but not the lining layer. Statistically higher numbers ( $p < 0.001$ ) of HHV-7 positive lymphocytes revealing median value 3.5 (IQR 1.75; 8.25) compared with HHV-7 positive plasmocytes median value 1.0 (0.0; 2.0), endotheliocytes median value 1.5 (0.0; 4.00), and macrophages median value 0.0 (0.0; 1.0) were found. Moderate correlation was found between HHV-7 expression and synovitis score ( $r = 0.651$ ;  $p = 0.012$ ), HHV-7 positive lymphocytes and synovitis score ( $r = 0.693$ ;  $p = 0.006$ ), HHV-7 expression and blood vessels density ( $r = 0.470$ ,  $p = 0.002$ ).

**Conclusion.** The given grading system is recommended evaluating inflammation, specifying the damage of synovial membrane. Synovial expression of HHV-7 in chronic arthritis patients might suggest on the virus role in disease exacerbation.

## CHANGES OF 20S PROTEASOME SUBUNIT EXPRESSION AND IMMUNOREACTIVITY IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA

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**Keywords.** BPH, proteasome, LMP7.

**Objectives.** Benign prostatic hyperplasia (BPH) is frequent disorder among men over 40 years of age. The progressive proliferation of the connective tissue components of the prostate occurs, resulting in increased gland volume. In BPH there is a balance disorder between proliferation and apoptosis. Proteasomes take part in many cellular processes such as degradation of damaged cellular proteins. Literature data indicate a significant positive correlation between the increase proteasome activity and the expression of apoptosis inhibitors, which may affect the development of BPH.

The aim of the study was detection and comparative assessment of immunoreactivity of 20s proteasome subunit - LMP7 and PSMB8 gene expression (coding LMP7) in BPH depending on the gland volume.

**Materials and methods.** The study was conducted in material from 30 patients with BPH divided into 3 groups of 10 patients each: G1 (prostate volume 70 – 90 cm<sup>3</sup>), G2 (91 – 120 cm<sup>3</sup>), G3 (121 – 150 cm<sup>3</sup>). Parafine sections were stained with hematoxylin and eosin (H+E) for general histological assessment. For LMP7 identification immunohistochemical reaction was conducted (EnVision method). The PSMB8 expression was evaluate with RT-qPCR.

**Results.** In H+E staining the increase of cells number and the stromal fibers with the prostate volume increase were observed. Intensity of the immunohistochemical reaction showing LMP7 increased in proportion to the volume of the prostate, in the glandular epithelium and connective tissue. The PSMB8 gene expression was statistically significantly higher in patients in the G2 and G3 groups, as compared to men with the lowest prostate hyperplasia (G1).

**Conclusion.** The obtained results indicate that the expression of the 20s proteasome subunit undergoes significant changes in the course of benign prostatic hyperplasia. Demonstrated increase in LMP7 subunit expression of immunoproteasomes may indicate the important role of these structures in BPH. These changes could be used for diagnostic or therapeutic purposes of BPH.

## THE RELATIONSHIP BETWEEN TUMOR VOLUME AND THE SYSTEMIC INFLAMMATORY RESPONSE IN PATIENTS WITH SURGICALLY TREATED COLORECTAL CARCINOMA

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**Keywords.** Systemic inflammatory reaction, colorectal cancer.

**Objectives.** Colorectal cancer (CRC) is the third most commonly diagnosed cancer in males and the second in females, with 1.8 million new cases and almost 861,000 deaths in 2018 according to the World Health Organization. Inflammation is increasingly recognized as a major factor in cancer development and progression (Lam et al. 2015). Aim of the present study was to assess relation between the CRC volume and the systemic inflammatory reaction.

**Materials and methods.** The study included 264 surgically treated primary CRC cases. Data were collected by archive search. The neutrophil-to-lymphocyte (NLR), platelet-lymphocyte (PLR), lymphocyte-monocyte (LMR), neutrophil-monocyte (NMR) ratios and C-reactive protein (CRP) was calculated according to the absolute counts on routine blood tests prior to surgery. CRC cases were divided in 2 tumor volume-based groups: I < 50 cm<sup>3</sup> and II > 50 cm<sup>3</sup>.

Descriptive and analytical statistics (Mann-Whitney test, Spearman's rank correlation) were performed with SPSS,  $p < 0.05$  was considered statistically significant.

**Results.** The mean tumor volume was: 17.4 cm<sup>3</sup> [13.7 - 21.9]. Distribution between groups was following: I = 40.5% [34.6 - 46.4] and II = 59.5% [53.6 - 65.4]. The median values in group I were: CRP 24.4 [10.2 - 34.6], NLR 3.4 [1.55 - 5.25], PLR 247.1 [181.0 - 307.2], NMR 7.7 [5.0 - 10.4] and LMR 2.2 [1.3 - 3.1]. Group II had following values: CRP 5.9 [2.3 - 9.5], NLR 2.9 [1.8 - 4], PLR 210.0 [129.6 - 290.4], NMR 7.6 [5.9 - 9.5] and LMR 2.8 [1.9 - 2.8]. There was a statistically significant correlation between group I and CRP [Spearman's  $r = 0.25$ ;  $p = 0.03$ ] as well as with PLR [ $r = 0.3$ ;  $p = 0.012$ ]. Group II had significant correlation with CRP [ $r = 0.231$ ,  $p = 0.013$ ]. There was statistically significant association between tumor volume groups and CRP ( $p = 0.03$ ). NLR, LMR, NMR had no significant correlation regarding volume.

**Conclusion.** In surgically treated CRC patients, the tumor volume shows statistically significant correlation with CRP and PLR, thus tumors with volume higher than 50 cm<sup>2</sup> have association with lower CRP levels.

## ANALYSIS OF TP53, MDM2 AND CASP8 SNP IN LITHUANIAN WOMEN WITH BREAST CANCER

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**Keywords.** Breast cancer, SNP, biomarkers, cancer progression.

**Objectives.** Breast cancer (BC) is the most common women's oncological disease worldwide. Therefore, it is crucial to state molecular profile of tumor at the time of clinical diagnosis considering that personalized target therapy could be applied for women. Specific prognostic or predictive biomarkers could help to predict disease progression, apply precise treatment and potentially reduce mortality. The aim of this study was to assess frequencies of TP53 (rs1042522), MDM2 (rs2279744) and CASP8 (rs3834129) SNPs and evaluate the link between these gene variants with stage of BC.

**Materials and methods.** A total of 129 female BC patients from National Cancer Institute (Vilnius, Lithuania) were included in this study. All patients signed Informed consent before the study (permission of Vilnius Regional Committee of Bioethics No 158200-13-638-204). For TP53 Arg72Pro and MDM2 309 G > T SNPs genotyping PCR-RFLP was used. Bi-directional PCR allele-specific amplification (bi-PASA) was used to detect CASP8 -652 6N ins/del polymorphism.

**Results.** Our observations indicated that 41 patients (36.6%) were diagnosed with stage I BC also 41 (36.6%) - stage II, 27 females (24.1%) were found with stage III and 3 patients (2.7%) had stage IV. Genetic analysis showed that heterozygous genotype of TP53 Arg/Pro (87.6%) and CASP8 ins/del (55.0%) had the highest frequency in this sample but analysing MDM2 309 G > T SNP, homozygous T/T (52.7%) genotype was dominant. However, no statistically significant differences were found between TP53 Arg72Pro, MDM2 309 G > T, CASP8 - 652 6N ins/del SNPs and breast cancer stage (P-value = 0.57; 0.47; 0.77, respectively).

**Conclusion.** In breast cancer samples heterozygous genotype of TP53 Arg/Pro, CASP8 ins/del (55.0%) and homozygous MDM2 T/T (52.7%) SNP were dominant, however no significant correlation between BC stage and TP53, MDM2, CASP8 genes SNP were detected and further analysis including more samples is needed.

## MALE INFERTILITY AND GENETIC VARIANTS IN MTHFR AND TP53

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**Keywords.** Genetic polymorphism, MTHFR, TP53, male infertility, sperm quality.

**Objectives.** Even though infertility rate around the world is growing, risk factors for male subfertility remain unknown. However, genetic polymorphisms in methylenetetrahydrofolate reductase (MTHFR) and TP53 might have a role in idiopathic male infertility. This study is aimed to analyse the distribution of MTHFR 677C > T and TP53 72Arg > Pro polymorphisms amongst idiopathic infertile Lithuanian men whose partners were undergoing in vitro fertilization (IVF) treatment and to find associations between these polymorphisms and various clinical data.

**Materials and methods.** 61 men from Fertility Center Santara were included in the study. All men signed Informed consent (permission of Vilnius Regional Committee of Bioethics No 158200-14-743-260). Sperm quality was evaluated according to the World Health Organization criteria and sperm cells remaining after IVF were transported to the Biobank (Vilnius, Lithuania). After extracting genomic DNA from sperm cells, the two polymorphisms, MTHFR 677C > T and TP53 72Arg > Pro, were genotyped by PCR and PCR-RFLP. Results were statistically analysed.

**Results.** After sperm analysis from 61 men, 33 were normospermic, 8 polyspermic, 15 asthenospermic and 4 oligoasthenospermic. TP53 genotypes 72ProPro, 72ProArg and 72ArgArg were distributed amongst 8%, 89%, 3% of all subjects, it remained similar with only asthenospermic and oligoasthenospermic patients taken into consideration – 10%, 85%, 5% respectively.

Frequency of genotypes MTHFR 677CC, 677CT and 677TT in all subjects was 33%, 57%, 10%. It remained similar – 35%, 59%, 6% when only asthenospermic and oligoasthenospermic patients were considered.

Statistical analysis showed that there were no significant differences in MTHFR 677C > T and TP53 72Arg > Pro polymorphism's distribution between patients with different sperm quality.

**Conclusion.** Results of our pilot study did not show any statistical differences in the distribution of polymorphic variants in MTHFR and TP53 according to men sperm quality. However, more clinical samples needed to be included in the analysis, especially with poor sperm quality.

## FOLLICLE-STIMULATING HORMONE RECEPTOR (FSHR) POLYMORPHISMS AND OVARIAN RESPONSE TO STIMULATION

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**Keywords.** Assisted reproductive technologies, ovarian stimulation, FSH receptor, SNP, Asn680Ser, Thr680Ala.

**Objectives.** Ovarian stimulation is one of the most important steps in assisted reproductive procedures. Amount and quality of retrieved oocytes often determines pregnancy success. To our knowledge, this is the first study that observes Asn680Ser and Thr307Ala FSHR polymorphisms in Lithuanian women. The aim of this study is to investigate Lithuanian women undergoing assisted reproductive procedures follicle-stimulating hormone receptor (FSHR) Asn680Ser and Thr307Ala single nucleotide polymorphisms (SNP) and their association with clinical data and ovarian stimulation outcome.

**Materials and methods.** 66 women from Fertility Center Santara were included in the study. Follicular fluid with remaining granulosa cells were collected and for the future analysis transported to the Biobank (Vilnius, Lithuania). All women signed Informed consent before the study (permission of Vilnius Regional Committee of Bioethics No 158200-14-743-260). DNA was successfully extracted from 66 granulosa cells samples. FSHR polymorphism at positions 680 was determined by PCR-RFLP and at position 307 – by nested PCR-RFLP. Clinical data (age, amount and quality of retrieved oocytes, zygotes, embryos and procedure outcome (pregnancy) was registered in each women.

**Results.** The frequencies of Ser680Ser, Asn680Ser and Asn680Asn variants in analyzed samples were 38, 45, and 17 %, distribution of Thr307Thr, Thr307Ala and Ala307Ala variants was 30, 50 and 20 %, respectively. Our results showed that for Asn680Asn carriers the higher number of oocytes was retrieved with an average of 12.60 (SD ± 8.49). For SNP Asn680Ser carriers the lower number of oocytes was retrieved (average 10,23, SD ± 5.23) and Ser680Ser carriers provided less than other allelic variants – 9.36 (SD ± 5.70) oocytes.

**Conclusion.** Although Ser680Ser carriers provided less oocytes than other allelic variant carriers, the difference was not statistically significant. Regardless statistical significance the further analysis of various SNP is needed to find the biological markers for the ovarian stimulation prediction and outcome prognosis.

## INVESTIGATION OF NEW MOLECULAR TARGETS FOR THE PREDICTION OF PROSTATE CANCER BIOCHEMICAL RECURRENCE

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**Keywords.** Prostate cancer, radical prostatectomy, biochemical recurrence, SNP, molecular biomarkers.

**Objectives.** Prostate cancer (PC) is one of the most common cancers worldwide. Single-nucleotide polymorphisms (SNP) could be used as molecular targets to improve diagnostic, treatment of prostate cancer and predict disease progression as biochemical recurrence. Today clinical diagnosis of cancer still is based on classical clinicopathological characteristics. The investigation of new molecular biomarkers would help to diagnose, apply the personalized treatment and improve patients' follow-up or predict disease recurrence. The aim of this study was to assess the frequencies of TP53 (rs1042522), MDM4 (rs4245739), MDM2 (rs2279744) and CASP8 (rs3834129) SNP in prostate cancer patients and to find the association between SNP and biochemical recurrence (BCR).

**Materials and methods.** A total of 151 male PC patients after radical prostatectomy (RP) from National Cancer Institute (Vilnius, Lithuania) were included in the analysis. All patients signed Informed consent before the study (permission of Vilnius Regional Committee of Bioethics No 158200-13-638-204). PCR-RFLP method was used for identification of SNP of TP53 Arg72Pro (rs1042522), MDM2 309 G >T (rs2279744), MDM4 C >A (rs4245739) and Bi-directional PCR allele-specific amplification (bi-PASA) was used for CASP8-625 6N ins/del (rs3834129).

**Results.** From 151 PC patients 17 (14.4%) biochemical recurrence cases were observed. Analyses of PC patients showed that the most common genotypes in this sample are TP53 Arg/Pro (93.4%), MDM2 T/G (43.7%), MDM4 A/A (73.5%), CASP8 Ins/Del (53.6%). Statistically significant difference ( $p = 0,0067$ ) comparing tumor stages in BCR and BCR-free groups were found. However, none of SNP was significantly associated with BCR.

**Conclusion.** The most frequent SNP in Lithuanian PC patients were TP53 Arg/Pro (93.4%). However, no significant correlation between PC BCR and MDM2, MDM4, TP53, CASP8 gene SNP were detected. Longer follow-up period for patients' BCR episodes detection and further analysis is needed.

## MITOCHONDRIAL DNA HAPLOGROUPS AND TELOMERE LENGTH IN EXUDATIVE AGE-RELATED MACULAR DEGENERATION PATIENTS IN A LATVIAN POPULATION

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**Keywords.** AMD, qPCR, mtDNA haplogroups, telomere length.

**Objectives.** Age-related macular degeneration (AMD) is a complex eye disease of public health significance that causes severe vision loss. AMD has been associated with a number of genetic and environmental factors including mitochondrial damage and specific mitochondrial DNA haplogroups (mtDNA hgs). Also, changes in another cell structure – telomeres – are associated with age-related diseases. The aim of the study was to identify mtDNA hgs and to measure leukocyte telomere length (TL) in exudative AMD patients in comparison to healthy individuals in Latvian population.

**Materials and methods.** DNA was extracted from peripheral blood leukocytes of 59 AMD patients (age:  $77.23 \pm 8.52$ ; female percentage: 64.40%), and 56 age and sex-matched (age: 77.66; female percentage: 65.57%) healthy individuals as a control group. MtDNA hgs were characterized by PCR RFLP. qPCR was used to measure TL. Statistical analysis was performed using GraphPad Prism version 5 for Windows.

**Results.** mtDNA hgs were identified for 55 out of 59 patients (93.22%). 19 patients had hgH (32.2% [in a general Latvian population – 44.6%]), and 20 patients had hgU (33.9% [25.7%]). Hgs T, J and W were identified in 4 patients each (6.8% [in a general Latvian population – 8.7%, 5.9% and 4.0%, respectively]). HgV was detected in 1 patient (1.7% [4.4%]), and hgI – in 2 patients (3.4% [3.3%]). The relative TL was measured in all DNA samples, and it was significantly longer in exudative AMD patient group in comparison to the control group ( $p < 0.0001$ ).

**Conclusion.** The results have shown that AMD patients had longer telomeres than the control subjects. Previously, shorter TL was associated with geographic atrophy, but not with choroidal neovascularization. HgH was observed less often, and hgU more often in AMD patients compared to a Latvian population, indicating possible protection or predisposition to the disease. Further studies are needed to confirm these results.

## THE INNOVATIVE PQ BYPASS PROCEDURE FOR THE ENDOVASCULAR TREATMENT OF THE FEMORAL ARTERY

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**Keywords.** PQ, primary patency.

**Objectives.** PQ Bypass is a novel approach to fully-percutaneous transvenous femoral-popliteal bypass. The aim is to demonstrate that the endovascular transvenous bypass (ETB) provides equal patency rates compared to the surgical femoral-popliteal bypass (SFB).

**Materials and methods.** Data from 86 patients with PAD and femoral occlusions were collected and retrospectively reviewed. Two groups: SFB (n = 36) and ETB (n = 50).

Analyses - IBM SPSS 22.

**Results.** The mean age was  $64.9 \pm 7.4$  years. The mean operation length in both groups was  $1.73 \text{ h} \pm 0.70 \text{ h}$  ( $p = 0.874$ ), the mean lesion length was  $23.48 \text{ cm} \pm 7.62 \text{ cm}$  ( $p = 0.437$ ). The most frequent Rutherford grade was III (87.8%). At 1 year the ABI improved from  $0.57 \pm 0.13$  to  $0.88 \pm 0.19$  (SFB) and from  $0.61 \pm 0.13$  to  $0.96 \pm 0.23$  (ETB) ( $p = 0.690$ ), at 2 years - from  $0.58 \pm 0.1$  to  $0.90 \pm 0.17$  and from  $0.59 \pm 0.14$  to  $0.92 \pm 0.16$ , respectively ( $p = 0.864$ ). The 1-year primary patency was 88.9% (n = 36) and 76% (n = 50) (95% CI, 10.23 - 11.55;  $p = 0.144$ ; HR, 0.445), the 2-year - 78.9% (n = 20) and 57.6% (n = 33), respectively (95% CI, 17.34 - 21.79;  $p = 0.118$ ; HR, 0.179). The 1-year freedom from revascularization was 91.7% and 82.0% (95% CI, 10.79 - 11.83;  $p = 0.222$ ; HR, 0.455), the 2-year - 80.0% and 63.6%, respectively (95% CI, 18.13 - 22.31;  $p = 0.254$ ; HR, 0.528). At 1 year the Rutherford grade improved to I (42.9%) and 0 (80.0%), at 2 years - to I (35.0%) and 0 (90.6%), respectively.

**Conclusion.** The primary patency of PQ Bypass is non-inferior to SFB.

## ANALYSIS OF GENETICAL CAUSES OF UNCONJUGATED HYPERBILIRUBINEMIA IN LATVIAN PEDIATRIC PATIENTS

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**Keywords.** Gilbert's syndrome, hyperbilirubinemia, SLC01B3 gene, NUP153 gene.

**Objectives.** Unconjugated hyperbilirubinemia is typical sign of Gilbert's syndrome (GS). Most common molecular cause of this autosomal recessive disorder is (TA)<sub>7</sub> allelic variant in UGT1A1 gene promoter. GWAS discovered also non-UGT1A1 variants associated with unconjugated hyperbilirubinemia, e.g. in SLC01B3 and NUP153 genes. Aim is to analyze non-UGT1A1 genetic variations rs2417940(SLC01B3) and rs2328136(NUP153) association with unconjugated bilirubin level in pediatric patients.

**Materials and methods.** The study included 503 patients with diagnosed unconjugated hyperbilirubinemia. UGT1A1 gene promoter TA repeat allele was detected by fluorescent PCR and capillary electrophoresis. TaqMan assay for rs2417940 and rs2328136 genotyping was used. Data statistical analysis was performed using SPSS v22.0 software. Central tendencies of data are described as median (IQR).

**Results.** 158 (31.4%) of patients were females, median age 14.7 (12 - 16) years, and 345 (68.6%) were males, median age 15 (13.6 - 16.3) years. 437 patients are diagnosed with GS (TA<sub>7</sub>/TA<sub>7</sub>). Other patients had following genotypes TA<sub>7</sub>/TA<sub>6</sub> n = 56, TA<sub>6</sub>/TA<sub>6</sub> n = 10. Rs2417940 TT and CT genotypes shows association with higher total (p = 0.011) and unconjugated (p = 0.013) bilirubin levels. This association shows autosomal dominant inheritance pattern. For rs2417940 TT and CT genotypes median total bilirubin level is 40.0(31 - 56.6) and for CC genotype it is 35.9 (29 - 58.8) μmol/l. And median unconjugated bilirubin level for rs2417940 TT and CT genotypes is 30(20.8-44.3) and for CC genotype 26 (20 - 37.3) μmol/l. Bilirubin levels were not statistically different across rs2328136 genotype groups (p > 0.05).

**Conclusion.** For 437 patients hyperbilirubinemia is explained by GS (TA<sub>7</sub>/TA<sub>7</sub>).

SLC01B3 gene variation rs2417940 CC and CT genotypes are associated with higher total and unconjugated bilirubin levels. Rs2328136 genotype do not affect bilirubin levels.

## MEASUREMENT OF SCATTERED RADIATION WHILE USING PATIENT PROTECTIVE APRONS

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**Keywords.** Scattered radiation, lead apron, Compton scattering, conventional radiography, chest radiography, entrance skin dose (ESD).

**Objectives.** There are not so many empirical publications about the physical effectiveness of the lead aprons to protect from internal scattered radiation and the results of them are different: some say that the protective effect of the lead is insignificant, while others say that internal scatter from the shield may lead to a dose increase to the skin. The aim of this study was to quantify scattered radiation using the protective apron and to evaluate physical effectiveness of the use of the shield to protect against scattered radiation in chest radiography. The tasks of the study were to measure and analyse scattered radiation outside the collimated radiation field at different distances and points under the shield, on the shield, without the shield and at neck area.

**Materials and methods.** Ionization chamber was used to measure the entrance surface dose (ESD) at the centre of the X-ray beam and at different points while using protective apron on anthropomorphic phantom.

**Results.** The results show that for posterior-anterior (PA) projection of the chest the shield does not provide protection against scattered radiation as it is generated and spread within a phantom or patient. Scattered radiation doses under the lead apron and without it were equal. At the same time the concern that internal scatter from the apron may lead to a dose increase was not confirmed. Since the doses of scattered radiation under the shield and without it were equal, it can be concluded that the shield does not backscatter radiation.

**Conclusion.** The results of this study showed that the physical effectiveness of lead apron to protect from scattered radiation outside the collimated radiation field may be overestimated. Protective apron's radiation protection benefit during chest imaging is negligible.

## ACCURACY OF HEPATOCELLULAR CARCINOMA DIAGNOSTICS USING MULTIDETECTOR TRIPHASIC COMPUTER TOMOGRAPHY

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**Keywords.** Contrast-enhanced CT, Hepatocellular carcinoma, triphasic CT.

**Objectives.** Hepatocellular carcinoma (HCC) is the leading primary cancer of liver worldwide. Recent advantages in non-invasive imaging modalities have improved the diagnostics of hepatic malignant lesions enabling clinicians to identify and adjust treatment in early stages; hence improving survival rate. The aim of this study was to analyse retrospectively patients with primary HCC, using biopsy as a reference and reviewing examinations of triphasic computed tomography (TPCT) to assess characteristics of malignant nodules in the liver and evaluate the accuracy of TPCT imaging modality in correlation with histopathological and laboratory findings.

**Materials and methods.** Retrospectively was evaluated 56 nodules in 28 patients who underwent histopathological verification for HCC during the period from 2011 to 2017 in Oncology Centre of Latvia analysing patient images from database on TPCT consisting of native, postcontrast arterial, porto-venous and equilibrium phases scans.

**Results.** The study analysed 23 male, 5 female patients, mean age  $65.7 \pm 2.3$  years. TPCT confirmed hypervascularity in 94.3% ( $n = 54$ ) of nodules in arterial phase, early venous contrast wash-out was positive in 50/54 (92.6%) and pseudocapsule enhancement in equilibrium phase was identified in 26/ 54 (48.1%) nodules. Tumour size  $< 20$  mm was found in 12/56,  $\geq 20$  mm – 44/56 nodules. Hypodensity in native computer tomography (CT) exams were identified in 45/56 (80.4%) nodules, tumour size was associated with density (isodense  $n = 11$ , Me = 17 mm, IQR 12 – 45 mm vs. hypodense  $n = 45$ , Me = 35 mm, IQR = 27 – 82 mm  $p < 0.05$ ). There was no statistical significance between patients with and without liver cirrhosis and nodule count per liver (n/l) –  $n = 15$ , mean 2.3 n/l vs.  $n = 13$ , mean 1.6 n/l,  $p > 0.05$ .

**Conclusion.** TPCT provides high accuracy in terms of identifying and diagnosing HCC particularly based on arterial and porto-venous phase tumour features presence. Smaller nodule size was associated with an isodense pattern on native scans.

## CAVUM SEPTI PELLUCIDI – NORMAL ANATOMICAL VARIANT OR PATHOLOGICAL ABNORMALITY?

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**Keywords.** Cavum septi pellucidi, neuroembryology, limbic system.

**Objectives.** Cavum septi pellucidi (CSP) is a space between the laminae of the septum pellucidum, a part of midline structures of the brain. The CSP is not just an anatomical structure of academic curiosity. Clinically it has been associated for a long time with neuropsychiatric diseases, particularly, schizophrenia, post-traumatic stress disorder (PTSD), and chronic brain trauma. A cavum between the leaflets of the septum pellucidum may be also a sign of neurodevelopmental abnormality in midline structures of the brain as well as serious head trauma. There are contradictions in the literature concerning not only CSP and its clinical relations but also the embryology of this structure.

The aim of the study was to evaluate normal anatomy and variations of cavum septi pellucidi, its relationship with the brain's ventricular system, and to determine the relative frequency of CSP using radiological investigations data.

**Materials and methods.** In retrospective study 354 adult patients who underwent head computer tomography (CT) at the Riga East University Hospital, Department of Emergency Radiology in the year 2018 and no brain pathology was found. Exclusion criteria – on CT found cerebral pathology.

**Results.** Among 354 CT cases with no structural changes in the brain 182 (51 %) were men, 172 (49 %) women; mean age 60.5 (within the 19 and 98 years). The overall relative frequency of visualized CSP was 1.7 %; in men – 2.2 %; in women 1.2 % respectively.

**Conclusion.** Cavum septi pellucidi is well, clearly visualized anatomical finding on brain CT. The frequency of verified CSP in our study positively correlates with anatomical and radiological literature data. The next stage of the study would be the correlation of the obtained results with clinical data.

## A COMPUTED TOMOGRAPHY ASSESSMENT OF THE CORRELATION BETWEEN PULMONARY EMPHYSEMA AND CORONARY ARTERY CALCIFICATION IN PATIENTS WITH PERIPHERAL ARTERY DISEASE

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**Keywords.** Emphysema, coronary artery calcification, computed tomography.

**Objectives.** This study assesses whether a statistically significant correlation exists between pulmonary emphysema and coronary artery calcification and evaluates factors that might affect these parameters and play a role in their correlation. Keywords: emphysema, coronary artery calcification, computed tomography.

**Materials and methods.** A cross-sectional study was designed as a sub-study of the international FFRCT/PAD trial. Clinical parameters (body mass index [BMI] and smoking among others) and computed tomography (CT) data were evaluated in a cohort of patients with peripheral artery disease (PAD) stationed for surgical treatment of lower extremity arterial disease in the Latvian Centre of Cardiology. The Agatston/Janowitz coronary artery calcium score (CACS) and emphysematous lung volume (ELV; volume of lung tissue with voxel attenuation of  $\leq -950$  Hounsfield units) were used to describe coronary artery calcification and lung emphysema respectively.

**Results.** 107 patients were included in the study of which 85 (79.4%) male and 22 (20.6%) female. The median CACS was 625.5 units (U) (interquartile range [IQR] 295.5 - 1638.7), whereas the median ELV was 30.2 ml (IQR 10.8 - 77.3). When stratified according to cardiovascular event risk, most patients (67.3%, N = 72) fell into the severe risk category (CACS > 400 U), with a quarter of patients (23.4%, N = 25) having moderate risk (CACS 101 - 400U). 37 (38.5%) of the 96 patients for whom data was available were smokers. No statistically significant correlation was found between either CACS and ELV, or ELV and CACS risk categories ( $p > 0.05$ ). Smokers were not found to have a significantly higher CACS, CACS risk or ELV ( $p > 0.05$ ), and the only clinical parameter found to have a correlation to either CACS or ELV was BMI, which was markedly lower for patients with increased ELV ( $p = 0.001$ ,  $r = -0.344$ ).

**Conclusion.** No statistically significant correlation was found between pulmonary emphysema and coronary artery calcification in patients with PAD and neither CACS nor ELV were affected by smoking.

## NON-RUPTURED INTRACRANIAL ANEURYSM TREATMENT WITH BARRICADE COIL SYSTEM. CLINICAL AND RADIOLOGICAL RESULTS

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**Keywords.** Barricade Coil System. Intracranial aneurysm endovascular treatment.

**Objectives.** The aim of this study is to report the clinical and radiological results from non ruptured aneurysm endovascular treatment with Barricade coil system and 6-month follow up outcome.

**Materials and methods.** All patients went through radiological investigation before procedure to evaluate aneurysm size, neck and location and immediately after to evaluate success of the procedure. However only 40 patients participated in 6 month follow-up angiography to see procedure efficacy with aneurysm occlusion grade. Mean neck width was 3.1 mm, mean longest size 6.2 mm and mean shortest size 4.8 mm.

**Results.** Immediately after the embolization, complete occlusion was seen in 49 patient (90.7%) and subtotal occlusion/residual neck in 5 (9.3%). Stent-assisted procedure was in 19 (35.2%) patient and balon-assisted in 7 (13%). In 51 patient (94.4%) procedure went without complications, one patient (1.9%) had complication during procedure – small clots, one (1.9%) had vasospasm in early post-procedure period and technical complication – coil migration during embolization, was also seen in one patient (1.9%)

Amongst 40 patients who underwent control angiography after 6 month, in 38 patients (95.0%) was seen complete occlusion and in 2 patients (5.0%) was seen subtotal occlusion/residual neck. Clinical results in 40 patients were evaluated with modified Rankin scale in 6 month follow up and it was  $\leq 1$  (100.0%).

**Conclusion.** Non-ruptured aneurysm endovascular treatment with Barricade coil system has shown successful clinical and radiological results with low complication rate.

To evaluate interdependence of complications, subtotal occlusion with other factors a larger clinical trial is needed.

To truly evaluate Barricade coiling systems efficacy in intracranial aneurysm treatment we should also include results from ruptured aneurysm treatment study.

## EVALUATION OF PEDIATRIC COMPUTED TOMOGRAPHY AND ASSOCIATED RADIATION EXPOSURE

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**Keywords.** CT, pediatric population, ionising radiation.

**Objectives.** Computed tomography (CT) is one of the most frequently used imaging modalities, however its use in pediatric population is limited due to high radiation doses. Since 2013 topic of dose reduction in pediatric CT is included in radiation protection courses of Riga Stradin's University.

The objectives of this study were to assess CT dose parameters in one of regional hospitals in Latvia, thus gaining impression on overall situation in the country and to evaluate whether dose management is necessary.

The aim was to assess two dose metrics that account for both radiation intensity and total radiation in pediatric head CT examinations and to compare them with European pediatric dose reference levels (PiDRL).

**Materials and methods.** This retrospective descriptive study included 157 pediatric patients who underwent CT examination of the head at one regional hospital in Latvia from July 2016 till June 2018.

**Results.** All patients (n = 157) were 1 - 17 years old. they were divided into two groups based on their age: 1st group (n = 47) included patients younger than 10 years, the 2nd group (n = 109) included patients older than 10 years.

Mean values of CTDIvol in the 1st group were 62.23 mGy (2016), 63.04 mGy (2017), 62.76 mGy (2018). Mean values of DLP were 1309.42 mGy x cm (2016), 1131.75 mGy x cm (2017), 1148.20 mGy x cm (2018).

Mean values of CTDIvol in the 2nd group was 60.23 (2016), 62.86 (2017), 61.67 (2018). Mean values of DLP were 1214.29 (2016), 1172.23 (2017), 1236.94 (2018).

Recommended European guidelines for CTDIvol values vary from 24 to 50mGy and DLP values vary from 300 to 650mGy cm based on the age of child.

**Conclusion.** Doses from CT scans of head were higher than quoted in European guidelines for diagnostic reference levels for pediatric imaging.

## COMBINED EFFECT OF HPV AND SINGLE NUCLEOTIDE POLYMORPHISMS IN TP53, MDM2, MDM4, MTHFR, CCR5, AND CASP8 IN LARYNGEAL CANCER

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**Keywords.** P53 pathways genes, human papillomavirus, laryngeal cancer prognostic markers, SNPs, LSCC patient survival.

**Objectives.** Laryngeal squamous cell carcinoma (LSCC) is one of the most common head and neck tumours. The molecular mechanism of LSCC remains unclear.

The aim of this study was to evaluate the prevalence of Human papillomavirus (HPV) and single nucleotide polymorphisms (SNPs) of TP53, MDM2, MDM4, MTHFR, CASP8, CCR5 genes in LSCC, and to assess its correlations with patients survival.

**Materials and methods.** 49 LSCC patients were enrolled in this study. PCR and qRT-PCR was used to detect, identify and quantify HPV. SNPs were genotyped using PCR and PCR-RFLP.

**Results.** By analysing the interactions of the SNPs of the genes with clinical parameters, the majority of patients with lymphnode status (N1,2) were identified as carriers of MDM2 T/G, CASP8 ins/del, CCR5 wt/wt SNP. Cluster analysis showed that patients with MDM2 T/T SNP survive longer than patients identified as CASP8 ins/ins MTHFR C/C and MDM4 A/A variant carriers, meanwhile LSCC patients with MDM2 T/T polymorphic variant had the best survival. Multivariate analysis showed that HPV positive patients without metastasis in regional lymph nodes (N0) and harbored CASP8 ins/del variant had the best survival, hereby HPV negative patients with identified metastasis in lymph nodes (N1 and N2) and CASP8 ins/del variant had poor survival.

**Conclusion.** This finding suggests a different patients survival prognosis and tumor behavior according HPV status, SNP variants and lymph node status of the LSCC.

# INFECTIOUS DISEASES, DERMATOVENEROLOGY, MICROBIOLOGY, IMMUNOLOGY, ALLERGOLOGY

## BEAUTY DANGERS: CONTACT SENSITIZATION TO COSMETIC ALLERGENS IN LITHUANIA

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**Keywords.** Allergic contact dermatitis, cosmetic allergens, patch test.

**Objectives.** To describe the current frequency and pattern of patch test reactivity to cosmetic allergens included in the European baseline, Cosmetic and Acrylate series in patients presented with ACD symptoms.

**Materials and methods.** Data of the consecutive patch-tested patients between 2017 and 2018 at Vilnius University Hospital Santaros Klinikos with suspected ACD caused by cosmetics was retrospectively analyzed. Patients were tested with the European baseline series, Cosmetic series, Acrylate series (Chemotechnique, Sweden) and in some cases with their own cosmetics.

**Results.** 170 patients (147 (86.5%) women and 23 (13.5%) men) were patch-tested. Patch tests for cosmetic ingredients were positive in 84 (49.4%) patients (mean age- 41 years). Most common localization of the dermatitis in patch-test positive patients were head and neck (42.8%), hands (34.5%). The most common positive patch-test haptens were methylisothiazolinone (MI) (48.8%), shellac (27.9%), Myroxylon Pereirae balsam (24.1%), formaldehyde 2.0% aq. (24.1%), methyl dibromo glutaronitrile (MDBGN) (23.3%), methylchloroisothiazolinone and MI mixture (21.7%), fragrance mix I (16.9%). Almost all positive reactions were currently clinically relevant except for shellac and MDBGN. Out of 19 patients tested with their own cosmetics and 8 tested with Acrylate series, positive results were found in 7 (36.8%) and 5 (62.5%) patients respectively. These positive reactions were all clinically significant.

**Conclusion.** Half of the patients presented with suspected ACD showed contact sensitization to cosmetic ingredients. The most common sites of dermatitis were head, neck and hands. The most common allergens were preservatives and fragrances. These results are in concordance with the results from other European clinics. Testing with patients' own products is rarely positive, but is of the highest clinical relevance if positive, and can reveal new allergens.

## DESCRIPTION AND DISCUSSION OF DISCREPANCY IN ANTINUCLEAR ANTIBODY (ANA) DETECTION USING INDIRECT IMMUNOFLUORESCENCE ASSAY (IIFA) AND CHEMILUMINESCENCE IMMUNOASSAY (CIA)

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**Keywords.** Antinuclear antibody, ANA detection, IIFA, CIA.

**Objectives.** Indirect immunofluorescence assay (IIFA) is time and labour consuming method while chemiluminescence immunoassay (CIA) is automated method with rapid turnaround time. The aim was to describe and discuss the discrepancies in the results of IIFA and CIA for the detection of antibodies to cellular antigens – antinuclear antibodies (ANA).

**Materials and methods.** ANA testing was performed by IIFA (Nova Lite HEp-2 ANA, Inova) and CIA (QUANTA Flash CTD Screen Plus, Inova) in serum samples. After IIFA and CIA for ANA (n = 73) the obtained data was analysed and interpreted with emphases on the discrepancy in the test results. In case of disagreement between IIFA and CIA results additionally was determined antibodies to extractable nuclear antigens (ENA) (QUANTA Flash ENA7, Inova) and antibodies to double stranded DNA (anti-dsDNA) (QUANTA Flash dsDNA, Inova).

**Results.** While in 80,8% (n = 59) the results were accordingly positive (13,7%; n = 10) or negative (67,1%; n = 49) they were contradictory in 19,2% (n = 14). The last group consisted of 15,1% (n = 11) IIFA positive and CIA negative samples and 4,1% (n = 3) IIFA negative and CIA positive. In IIFA positive, CIA negative group ENA and anti-dsDNA were negative in all cases. In IIFA negative, CIA positive group ENA or anti-dsDNA were positive in 2 cases.

**Conclusion.** While combined IIFA and CIA for ANA give equal results in the majority of the cases it fails to give clear interpretation in about every 5th tested sample. ENA and anti-dsDNA can confirm ANA positivity in case of IIFA negativity and CIA positivity but do not facilitate IIFA positive and CIA negative results. The frequency of the latter could be explained by higher sensitivity of IIFA that result of the higher number of antigens that are present in used human epithelial-2 cells (HEp-2) than in CIA, but also could be interpreted as false positive results.

## MICROBIOLOGICAL EXAMINATION OF SERBIAN MILITARY DEPLOYMENTS

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**Keywords.** Tropical infective agents, military deployment, malaria, West Nile virus, Dengue virus.

**Objectives.** The Serbian military engage in missions that range from combat operation to disaster and humanitarian relief efforts. Malaria, arboviral diseases, leishmaniasis, trypanosomiasis, and other vector-borne diseases present the leading concern for operations in the regions characterized by poverty, environmental extremes, endemic diseases, and inadequate health resources. Water-borne diseases, zoonoses, enteric, and sexually-transmitted infections should be also considered. The aim was to present and evaluate the results of microbiological testing of Serbian UN military deployments in Africa.

**Materials and methods.** Samples of the military personnel deployed in the Central African Republic, Congo, Côte d'Ivoire, Mali, Liberia and Somalia, were tested for presence of malaria parasites, antibodies to Dengue and West Nile virus, and for syphilis and HIV as well.

**Results.** Out of 385 samples for malaria, 5.4% were positive, during and after deployment. Antibodies against Dengue and West Nile virus were registered in significant percent (13.5% of 303 tested samples, and 34.9% of 166 samples, respectively).

**Conclusion.** Considering clinical presentation and consequences, including one death, it's clear that malaria remains the major problem concerning military deployment. Further molecular detection of plasmodium species and their resistance to antibiotics is planned. Testings for diseases like Lassa fever, Chikungunya, leishmaniasis, schistosomiasis, as well as for Ebola and Zika viruses, will be done in future, as they present serious threat. Extensive microbiological analyses pose as the fundament of successful military operation. Therefore, infective agents shouldn't be underestimated due to possible suspension or cancellation of military operations, and moreover, public health problem after soldiers' returning, so the preventive and diagnostic capabilities should be constantly advanced.

## SEROLOGICAL AND CLINICAL EVALUATION OF INFANTS BORN TO MOTHERS EXPOSED TO THE TOXOPLASMA GONDII DURING PREGNANCY

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**Keywords.** *Toxoplasma gondii*, congenital toxoplasmosis.

**Objectives.** Congenital toxoplasmosis can cause a disease with severe symptoms at birth. Serological and clinical evaluation of new-born babies born to mothers exposed to the parasite during pregnancy gives a chance to identify infected babies and initiate treatment. The absence of specific IgM or IgA antibodies, which are the mainstay for diagnosing congenital toxoplasmosis, is common. Therefore, the diagnosis must be based on the IgG antibody response and on the presence of symptoms. The aim was to present the clinical and serological evaluation of uninfected infants who were exposed to the *Toxoplasma gondii* during pregnancy.

**Materials and methods.** The study is a retrospective analysis of medical records of children consulted in the Outpatient Clinic of Białystok Children's Clinical Hospital at the Medical University.

**Results.** We analyzed lab test results and clinical evaluation of 98 uninfected infants and their mothers exposed to the parasite during pregnancy. The majority of mothers received treatment for median 5 months (interquartile range (IQR), 2 – 6 months). The main indication for starting treatment were presence of specific anti-*Toxoplasma* IgM antibodies (46%) and increase in anti-*Toxoplasma* IgG titers (34%). Right after birth abdominal and head ultrasound was performed in 14% and 33% of cases, respectively. Fundoscopy in the neonatology departments was done in 11% of children only. Serological evaluation revealed that in 63 infants maternal antibodies persisted less than 6 months.

**Conclusion.** Regardless increased risk of infection with *T. gondii*, neonatal departments did not evaluate the majority of new-borns. Exposed new-borns require prompt assessment on an out-patient basis. Suspicion of congenital infection in asymptomatic infants should be raised in case of presence of specific IgG antibodies for longer than 6 months.

## CLINICAL, LABORATORY AND RADIOLOGICAL FINDINGS AND TRENDS IN TREATMENT OF PATIENTS WITH LIVER ABSCESES

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**Keywords.** Liver abscess, clinical patterns, treatment.

**Objectives.** Although liver abscess (LA) is a well-described disease in the medical literature information about its characteristics in Latvia is scarce. The aim was to evaluate aetiological, clinical patterns and instrumental findings of LA, as well as treatment modalities used.

**Materials and methods.** Medical records of LA cases registered in Rīga East University Hospital clinical centre "Gaiļezers" from January 2012 to October 2018 were retrospectively reviewed. Statistical data was processed by IBM SPSS Statistics v23.

**Results.** Out of total 95, including 5 recurrent, cases 52.6% (N = 50) were men and 47.4% (N = 45) were women, mean age = 64.5 ± 15.9, range 27 - 95 years.

The most common documented risk factors for LA were underlying biliary tract abnormalities (37.9%, N = 36), and diabetes mellitus (12.7%, N = 12), while in 21.1% (N = 20) LA were cryptogenic. The majority of patients presented with fever (70.5%, N = 67); right upper abdominal pain was reported in 61.1% (N = 58), while vomiting and/or nausea in 25.3% (N = 24).

Infectious agents were isolated from LA in 65.3% (N = 62). Most common isolates identified were *K.pneumoniae*, 40.3% (N = 25), mainly in monomicrobial LA, and *E.coli*, 22.6% (N = 14), predominantly in polymicrobial LA ( $\chi^2$  (1, N = 39) = 5.61, p = 0.018).

Ceftriaxone and metronidazole intravenous formulations were used in 35.5% (N = 33) as the principal antimicrobial combination at hospital. Median overall expected duration of antimicrobial treatment was 15 days (IQR, 11 - 23). LA drainage was performed in 87.4% (N = 83) for the median duration of 7 days (IQR, 6 - 10.75). In 86.3% (N = 82) approaches were combined.

**Conclusion.** Our study indicates peak LA incidence in patients' seventh decade. *K.pneumoniae* and *E.coli* were the most common isolates, accounting for more than half of all microbiologically confirmed cases. Once recognized, broad-spectrum antimicrobials and drainage are the mainstay of management for LA, although according to current recommendations antimicrobial treatment duration is insufficient.

## CHLAMYDIA: EPIDEMIC OF THE XXI CENTURY

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**Keywords.** Chlamydia, sexually transmitted infection, treatment effectiveness.

**Objectives.** Chlamydia infection is the most common bacterial sexually transmitted disease in the world with over 130 million new cases being reported each year. The aim of the study was to explore the epidemiological distribution, most prominent complaints, diagnostics, and treatment of Chlamydia trachomatis infection.

**Materials and methods.** A retrospective analysis of *C. trachomatis* infection was conducted by reviewing patient log journals and outpatient medical files between 2014 and 2018 in Vilnius University Hospital Santaros klinikos Centre of Dermatovenereology. A total of 180 patient records were collected and analyzed using SPSS v.23, data reliability was calculated using Independent Samples t-test, Chi-square test.

**Results.** During 2014 – 2018, a slight annual decrease in number of cases was identified. 58.3% of patients were male (N = 105) with a mean age of  $31.6 \pm 8.2$  years, compared to 41.7% (N = 75) females, mean age  $29.1 \pm 10.0$  years ( $p = 0.075$ ). The most common reason for seeking medical care was self-referral (63.8%, N = 67), followed by a referral from a rheumatologist (12.3%, N = 13) and a GP (10.5%, N = 11) for men and a rheumatologist (33.3%, N = 25), self-referral (22.7%, N = 17) and a gynecologist (20%, N = 15) for women. In 66.1% (N = 119) of cases, the infection was symptomatic, with no significant difference between sexes ( $p = 0.143$ ). The most common presentation in males was genital discomfort (23.8%, N = 25), urethral discharge (21%, N = 22) and dysuria (21%, N = 22), in females – vaginal discharge (32%, N = 24), arthralgias (26.7%, N = 20) and pelvic pain (13.3%, N = 10). In women, 46.9% (N = 15) of urethral, 71.6% (N = 53) of vaginal and 84.4% (N = 54) of cervical smears showed elevated WBC counts, while 72.4% (N = 76) of urethral smears had the same findings in men. All cases were *C. trachomatis* PCR test positive, 33.9% (N = 61) also had *U. parvum*, 16.1% (N = 29) *U. urealyticum*, 15% (N = 27) *M. hominis* coinfection. The most frequent treatment was oral Doxycycline (57.8%, N = 104), oral Azithromycin (28.3%, N = 51) or their combination (11.7%, N = 21). 62.2% (N = 112) of the patients presented for a follow up examination, out of which 84.5% (N = 98) showed clearance of infection. Doxycycline was ineffective in 6.3% (N = 4) of cases, Azithromycin – 10.7% (N = 3) ( $p < 0.05$ ), 12.9% (N = 15) of patients received additional treatment.

**Conclusion.** Chlamydia affects young, working age population. More than half of patients were asymptomatic. Prescribed treatment was effective in most cases, Doxycycline was significantly more effective than Azithromycin.

## IMPLICATION OF HUMAN PARVOVIRUSES IN AETIOLOGY OF MENINGITIS AND MENINGOENCEPHALITIS

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**Keywords.** Human parvoviruses, meningitis, meningoencephalitis.

**Objectives.** For significant number of clinical cases of viral meningitis and meningoencephalitis no aetiological agent is revealed. The aim of the study is to evaluate the implication of human parvovirus B19 (B19V), human bocaviruses (HBoVs) and human parvovirus 4 (hPARV4) in the development of mentioned neurological disorders.

**Materials and methods.** To determine the presence of HBoVs, B19V and hPARV4 genomic sequences in peripheral blood, cell free blood plasma and/or cerebrospinal fluid (CSF) DNA samples of patients with meningitis or meningoencephalitis (n = 42) and blood donors (BD) (n = 50) nPCRs targeting hPARV4 VP2, B19V NS1, HBoV1 NS1 and HBoV1-4 VP1/2 protein genes were used. Information about patients' demographics, clinical diagnoses, duration of hospitalization and outcome, symptoms, results of blood tests, microbiological tests and CSF analysis were retrospectively reviewed from the clinical data. IBM SPSS v22 and GraphPad Prism 8.0 were used for data analysis.

**Results.** In total HBoV1-4 DNA was found in 52.4% of patients and 28.0% of BD (p = 0.0199), B19V genomic sequence - in 16.7% of patients and 6.0% of BD (p = 0.1769), respectively. hPARV4 genomic sequence was not detected in any of the patients' or BD DNA samples. Active parvoviruses infection defined as the presence of viral genomic sequences in patients' CSF and/or cell-free blood plasma DNA, was found in 15 (35.7%) patients. Headache (p = 0.01), more intense headache (p = 0.01), fatigue (p = 0.03), disorientation (p = 0.004) and difficulties to concentrate (p = 0.03) were significantly more often present in patients with active parvoviruses infection in comparison to patients with active infection caused by other confirmed pathogens.

**Conclusion.** This is the first study showing the presence of HBoVs in adult patients with neurological disorders as well as in blood donors in Latvia. HBoVs and B19V affect clinical manifestations of meningitis and meningoencephalitis therefore might be one of the causative agents of these particular disorders.

## USE OF METAGENOMICS OR 16S SEQUENCING FOR FASTER IDENTIFICATION OF MICROORGANISMS IN BRONCHIAL WASHINGS

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**Keywords.** Microbial culture, 16S rRNA sequencing, metagenomics, pneumonia.

**Objectives.** Community-acquired pneumonia is one of the leading causes of adult hospitalization and death worldwide. Microbial culture is considered to be a gold standard for the identification of bacteria. Metagenomics or 16S rRNA sequencing is starting to play a significant role in identification of infectious agents. The aim of this study is to compare 16S rRNA sequencing results and microbial culture results, and to determine applicability of metagenomics in clinical microbiology.

**Materials and methods.** A retrospective study of bronchial washing samples from patients with suspected pneumonia which had microbial culture and 16S rRNA sequencing performed. Standard microbiological cultures were performed in Riga East Clinical University Hospital laboratory of microbiology on appropriate media. Patient clinical and microbiological data were obtained from the medical records and laboratory information system. Molecular biology analysis was performed at the Department of Molecular Biology of the Institute of Food Safety, Animal Health and Environment "BIOR" using widely applied method for amplification and sequencing. We used  $\geq 10\ 000$  CFU/ml in microbial culture and  $\geq 15\%$  of taxonomically identified sequence variants in metagenomics as the threshold values to identify potential infectious agents.

**Results.** Thirty-two patients were included in the study. Compared to microbial culture, metagenomics sequencing could identify the same infectious agent in 26 of 32 cases (81%). The sensitivity of this method was 50.88% (confidence interval (CI) 37.29% to 64.37%) and specificity was 95.09% (CI 90.54% to 97.86%), with a positive predictive value of 78.38% (CI 63.77% to 88.19%) and negative predictive value of 84.70% (CI 80.92% to 87.84%).

**Conclusion.** Metagenomics can be used to identify microorganisms that cause pneumonia. Although this method is sensitive and highly specific, a number of limitations must be resolved before it can be applied in clinical microbiology.

## EPIDEMIOLOGY AND RISK FACTORS OF TOXOPLASMA GONDII IN PREGNANT WOMEN, HUNTERS AND VETERINARIANS IN LATVIA

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**Keywords.** Toxoplasmosis, infection prevalence, target group population, risk factors.

**Objectives.** Toxoplasmosis is one of the most common parasitic infection around the world. Asymptomatic infection in immunocompetent patients can persist; however primary infection patients with immune deficiency syndrome may cause severe consequences and disability. The aim of present study was to determine the seroprevalence of *T. gondii* and analyze possible risk factors associated with *T. gondii*.

**Materials and methods.** The serum samples (n = 491) collected from volunteer participants were tested using NovaLisa IgG and IgM enzyme immunoassays for anti-*T. gondii* according to the manufacturer's instructions.

**Results.** The overall anti-*T. gondii* IgG prevalence were observed 55.6% and was significantly higher than IgM prevalence which was 4.5%. The question which the present study were trying to solve is: Does the daily habits like patients occupation, diet, ownership of pet animals, gardening in kitchen garden increase the risk of toxoplasmosis infection?

**Conclusion.** The results of present study provide data showing the high *T. gondii* seroprevalence in Latvian population and call for higher awareness of zoonotic parasite infection in Latvia.

## PSORIASIS PATIENTS' KNOWLEDGE AND CONCERNS TOWARDS BIOLOGICAL THERAPY

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**Keywords.** Biological therapy, psoriasis.

**Objectives.** Biological therapy is effective treatment for psoriasis, though controversial among the patients. The aim of the study was to review psoriasis patients' knowledge and concerns towards biological therapy.

**Materials and methods.** The anonymous questionnaire of 21 question about biological therapy was given to 200 psoriasis patients the possible candidates for biological treatment. The questionnaire contained personal demographic data, psoriasis history, knowledge and concerns towards biological therapy. The data was analysed using IBM SPSS.

**Results.** Most of 200 respondents was 30 - 39 years old (28%) women (69%) educated in university (34%). The average duration of psoriasis was > 10 years (62%) followed by psoriatic arthritis (30%) and nails damage (53%). The patients were prescribed corticosteroids (44%), emollients (38%), phototherapy (26%), keratolytics (26%) and no biologics yet (0%). Only 42% (n = 84) of the respondents were aware of biological therapy, mostly through the internet and social media (67%). When asked about biological therapy, the majority of the patients named it as an alternative immunosuppressive treatment (50%) for mild to severe psoriasis (79%) promising full recovery (52%). Frequent infections (35%), fatigue (30%), headache (24%), nausea with vomiting (30%) and infertility (22%) were labelled as the main side effects causing concerns for 29% of the respondents. Still, high biological therapy effectiveness would cover side effects for the majority of the patients (60%) and 38% of them would agree to try biologics if prescribed by their dermatovenerologist.

**Conclusion.** Biological therapy for psoriasis is not well known by the patients as less than a half of them were aware of it. The majority of the respondents correctly described the treatment, yet hoped for full recovery. The side effects of biological therapy were named correctly, except for the infertility issues. More than one third of the patients would agree to try biological treatment, because high medications' effectiveness is more important than possible side effects.

## DIFFERENCES IN ROUTINE CEREBROSPINAL FLUID ANALYSIS RESULTS IN CHILDREN WITH LYME NEUROBORRELIOSIS, TICK-BORNE ENCEPHALITIS AND ENTEROVIRAL MENINGITIS

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**Keywords.** Lyme neuroborreliosis, Tick-borne encephalitis, enteroviral meningitis.

**Objectives.** The overwhelming majority of viral meningitis cases are caused by non-polio enteroviruses. However, tick borne diseases, namely Lyme neuroborreliosis (LNB) and tick-borne encephalitis (TBE), should also be considered a possible cause of aseptic meningitis in children living in endemic areas. Diagnosing remains challenging because serology tests produce false-positive results and the two-step approach in LNB is time-consuming. Therefore we aimed to identify early-available findings suggestive of neuroborreliosis by comparing laboratory test results in children with neuroborreliosis, TBE and enteroviral meningitis (EM).

**Materials and methods.** A retrospective analysis of medical records of patients with LNB, TBE, and EM hospitalized in University Children's Clinical Hospital of Białystok between 2016 and 2018.

**Results.** A total of 141 children were included (26 TBE, 21 LNB, 94 EM). There were no significant differences in median cerebrospinal (CSF) pleocytosis. In the LNB group there was significantly higher percentage of lymphocytes in CSF (median 90; interquartile range (IQR) 82 - 94 %), as compared to TBE (median 71; IQR 35 - 88 %;  $p < 0.01$ ), and EM (median 60; IQR 31 - 77 %;  $p < 0.01$ ). In LNB we observed the highest CSF protein (median 73; IQR, 48 - 100 mg/dL), as compared to TBE (median, 49; IQR, 34 - 63 mg/dL;  $p < 0.01$ ), and EM (median, 32; IQR, 25 - 42 mg/dL;  $p < 0.01$ ). Low CSF protein concentration and low CSF lymphocytes had a strong negative predictive value (NPV) for LNB. The optimum cut-off values were 70 mg/dL and 70 %, respectively. Combination of both CSF parameters reached NPV of 100%. However, positive predictive value was 28 % only.

**Conclusion.** General CSF analysis results does not suffice to suspect neuroborreliosis, but percentage of CSF lymphocytes under 70 % and concentration of CSF protein under 70 mg/dL might be helpful in distinguishing LNB from TBE and EM.

## BIOLOGICAL THERAPY FOR PSORIASIS IN LITHUANIA: TREATMENT REVIEW BASED ON PATIENTS' EXPERIENCES

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**Keywords.** Biological therapy, psoriasis.

**Objectives.** Biological therapy is alternative treatment for psoriasis. The aim of the study was to review the effectiveness and trends of psoriasis treatment with biological therapy in Lithuania.

**Materials and methods.** The anonymous questionnaire of 18 questions about biological therapy was given to 100 psoriasis patients taking biological treatment in Lithuania in 2018. The questionnaire contained personal demographic data, biological treatment history and evaluation of effectiveness. The data was analysed using IBM SPSS.

**Results.** Most of 100 respondents was 40 – 49 years old (39%) men (60%) educated in university (44%). The average duration of psoriasis was > 10 years (89%) followed by psoriatic arthritis (72%) and nails damage (53%). All of the respondents were treated with biological therapy (100%) suggested by dermatovenerologist (65%). Some of the patients were treated with Adalimumab (7%), Ustekinumab (12%), Etanercept (15%), 27% could not name the medication, but most of the patients were treated with Infliximab (39%) for 1 – 5 years (41%) and started biological therapy after chronic psoriasis lasting > 10 years (86%). Biological therapy associated improvement of skin was observed after 1 – 2 months (47%), the improvement of nails and joints was noticed after 5 – 6 months (39%). 33% of the patients manifested biological therapy induced side effects, mostly frequent infections (52%), flu symptoms (43%), headache (33%), nausea and vomiting (30%). Yet more than a half of the patients (53%) were pleased by the effectiveness of biological therapy and 92% would choose this treatment again.

**Conclusion.** The majority of the patients were treated with Infliximab for 1 – 5 years and started biological treatment after chronic psoriasis lasting > 10 years. The condition of skin, nails and joints improved, but one third of the patients faced side effects, mostly frequent infections. Still more than a half of the patients were pleased by the treatment and almost all of them would choose biological therapy again.

## ANTIBIOTIC RESISTANCE PROFILE OF BACTERIA ASSOCIATED WITH LEAD- RELATED INFECTIVE ENDOCARDITIS IN PAULS STARDINS CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Antibiotic resistance, bacteria, lead-related endocarditis.

**Objectives.** Lead-related infective endocarditis (LRIE) is one of the most serious complications of cardiac implantable electrical devices. As the number of implanted devices grows every year, number of LRIE affected patients increases as well. Constantly growing bacterial antibiotic resistance is a major obstacle to successive treatment, which with increasing frequency leads to prolonged antibiotic usage, thus leading to greater toxicity and worse outcome. The aim was to evaluate antibiotic resistance profile of LRIE causal bacteria in Pauls Stradins University Hospital.

**Materials and methods.** The retrospective study has evaluated patients, who were referred to Pauls Stradins University Hospital due to LRIE, for lead extraction. Lead extraction was performed surgically or transvenously. Causal microorganisms were cultivated either from blood, leads or device pocket. IBM SPSS v22.0 software was used for data analysis.

**Results.** Forty-nine patients with LRIE were selected for this study. The mean age was  $60.8 \pm 17.2$  years. Thirty-four were men (69.4%). Thirty-two (65.3%) patients have received antibacterial treatment before sample collection. Thirty-one (63.3%) patient had positive culture. Two most common isolated bacteria were *S. aureus* (23.5%) and Coagulase-negative staphylococci (23.5%). Both frequently showed antibiotic resistance. *S. aureus* isolates were resistant in 63.6% of cases, mainly to Penicillin G (70.0%), while Coagulase-negative staphylococci were resistant in 83.3% of cases, most frequently to Penicillin G (71.4%) and erythromycin (45.5%). Neither were resistant to gentamicin and only 11.1% of Coagulase-negative staphylococci were resistant to rifampicin.

**Conclusion.** Due to considerable burden of resistant bacteria, high suspicion is needed in patients with cardiac implantable electrical devices, to detect causal bacteria and successfully treat LRIE early in the course of disease. This reduces length of antibacterial treatment and as consequence - reduces the toxicity of antibacterial agents and improves general outcome.

## BIOFILM FORMATION ON DIFFERENT BREAST IMPLANT SURFACES

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**Keywords.** Breast implants, biofilm, adhesion, colonization.

**Objectives.** The aim is to find out the difference in microorganism adhesion and the formation of biofilms on the surface of several breast implants.

**Materials and methods.** Three new breast implants with different surfaces (smooth, micro-textured and macro-textured) were used in this research. The contents of the implants were removed and the shell was cut in squares of 1cm<sup>2</sup>. The samples were tested with several microorganisms- *Staphylococcus epidermidis* (*S.epidermidis*), *Pseudomona aeruginosa* (*P.aeruginosa*) and *Candida albicans* (*C.albicans*) and divided into two groups - 2 hours (H) and 24H to determine adhesion and colonization intensity. After the incubation, samples were sonicated for one minute in 44 kHz frequency, then the suspense was mixed using VORTEX 1, later it was cultured on Trypticase soy and Sabouraud agar for 48 H.

**Results.** The best biofilm growth in 2 H group was shown by *P.aeruginosa* (smooth 454 CFU/cm<sup>2</sup>, micro 1135 CFU/cm<sup>2</sup> and macro 2383 CFU/cm<sup>2</sup> on average), followed by *S.epidermidis* (454 CFU/cm<sup>2</sup>, 340 CFU/cm<sup>2</sup>, 794 CFU/cm<sup>2</sup> on average respectively) and *C.albicans* (340 CFU/cm<sup>2</sup>, 113 CFU/cm<sup>2</sup>, 227 CFU/cm<sup>2</sup> on average respectively). In 24H group the best biofilm growth was shown by *P.aeruginosa* (smooth 1039115 CFU/cm<sup>2</sup>, micro 3019289 CFU/cm<sup>2</sup> and macro 11039403 CFU/cm<sup>2</sup> on average), followed by *S.epidermidis* (457592 CFU/cm<sup>2</sup>, 1318300 CFU/cm<sup>2</sup>, 3651201 CFU/cm<sup>2</sup> on average respectively) and *C.albicans* (10895 CFU/cm<sup>2</sup>, 16343 CFU/cm<sup>2</sup>, 36771 CFU/cm<sup>2</sup> on average respectively).

**Conclusion.** *P.aeruginosa* showed the best biofilm development in both groups on all breast implant surfaces, followed by *S.epidermidis* and *C.albicans*. Therefore, the worst implant from the microbiological perspective is macro-textured, then micro-textured followed by smooth. In 24H group statistically significant difference was discovered between smooth and macro-textured implants ( $p = 0.019$ , CI 95%), however there was no difference between smooth and micro-textured implant ( $p = 0.418$ , CI 95%). Further researches are needed to explore the differences in microorganism biofilm formation better.

## HIDRADENITIS SUPPURATIVA SEVERITY EVALUATION IN CLINICAL PRACTICE USING HURLEY, PGA AND IHS4 DISEASE SEVERITY SCALES AND THEIR COMPARISON TO DLQI AND NPRS

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**Keywords.** Hidradenitis suppurativa (HS).

**Objectives.** HS is chronic disease characterized by suppurative cutaneous lesions affecting skin that bears apocrine glands. Patients disease burden includes intense pain, work disability and overall poor quality of life. Multiple scaling systems are used to evaluate HS severity and this step is very important due to further therapy tactics. The aim of the study was to compare HS patient disease severity using Hurley, PGA and IHS4 scales as well as to compare disease severity with patient's life quality and pain intensity.

**Materials and methods.** Patients life quality was evaluated using DLQI questionnaire. The level of pain was evaluated using NPRS. Hurley, PGA and IHS4 scales were used for disease severity evaluation. Statistical analyses were performed using SPSS version 22.0 and Microsoft Excel version 14.

**Results.** In total 22 HS patients were included in the study. Hurley scale classified 6 patients in stage I, 12-stage II and 4-stage III.

IHS4 scale classified 3 patients as "mild", 8 patients as "moderate" and 11 patients as "severe". With PGA scale 1 patient was in category "clear", 5-"minimal", 6-"mild", 10-"severe" and no patient as "very severe". All three scales classified 3 patients with the same-stage III severity, 2 patients with stage II severity and 2 patients with stage I.

According to NPRS 5 patients admitted that they have no pain, 12 - mild pain, 1 patient had moderate and 4 - severe pain. According to DLQI 4 patients had no effect on life quality, 7 patients had small effect, 3 patients had moderate, 7 - very large effect and 1 - extremely large effect on his life because of HS.

**Conclusion.** Most of patients had none or mild pain, including patients with severe disease. There is no correlation with disease severity and DLQI scores.

## CELL PHONES OF MEDICAL PERSONNEL: A SILENT SOURCE OF BACTERIA

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**Keywords.** Bacterial contamination, nosocomial infection, cell phone.

**Objectives.** According to WHO, nosocomial infection occurs in 4 million of patients annually, increasing mortality rate and financial burden. With growing use of phones in hospitals we should find out- is it possible to spread bacteria with cell phones? The aim was to identify microorganisms of cell phone surfaces taken from medical personnel in Pauls Stradiņš' Clinical university hospital and to compare the results between General Surgery and Pulmonary disease units.

**Materials and methods.** An assay from 25 cm<sup>2</sup> of cell phone front surface was taken with a sterile cotton swab and transported in 3 ml of NaCl. It was sonicated for 1 minute at 44 kHz frequency and then mixed for 1 minute by Vortex 1. The obtained bacterial suspension was cultured at 37 °C on 3 types of culture medium- blood, mannitol salt and MacConkey agar. The pure cultures were identified by Vitek 2. Susceptibility to antibiotics was determined by Kirby- Bauer disc diffusion method.

**Results.** 30 assays from the Pulmonary disease unit were analyzed - 16 doctors' (75% contaminated), 14 - nurses' (73.6% contaminated) and 30 of General Surgery unit - 12 from surgeons (50% contaminated), 18 - nurses (62% contaminated). The most frequent pathogen in both units was *S. aureus* (71.4% in Pulmonary and 100% in Surgery), then *K. pneumoniae* (28.6% in Pulmonary). Other microorganisms included coagulase negative Staphylococci (43.4%). 100% of identified *S. aureus* were sensitive to all applied antibiotics, but 100% of *K. pneumoniae* was resistant to ampicillin.

**Conclusion.** While cell phones in Pulmonary disease unit were contaminated slightly more frequently than in General Surgery, the prevalence of pathogens were quite similar. The most frequent pathogens of this study were MSSA and *K. pneumoniae*. The results demonstrate that cell phones can increase risk for spreading nosocomial infections if not used with standart precautions.

## DIVERSITY OF BACTERIAL AGENTS AND THEIR ANTIBACTERIAL RESISTENCE IN LIEPĀJA REGIONAL HOSPITAL

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**Keywords.** Antibacterial resistance, bacterial agents, regional hospital

**Objectives.** Nowadays, one of the biggest problems faced by healthcare professionals is bacterial infections and their growing resistance to drugs. Since antibacterial resistance is a worldwide topic, the aim of this study was to find out what bacterial agents are present in the Liepāja Regional Hospital. Does in the period from 2011 to 2017, there has been an increase in the presence of the less common microorganisms or the increase of antibacterial resistance of the bacterial agents.

**Materials and methods.** The analysis of the data was carried out from the most common bacterial infectious agents in Liepāja regional hospital. All patient history in which at least one bacterial agent has been detected in a stationary have been reviewed.

Presents the results of 517 microbiological analysis from 2011 to 2017. The incidence of fixed microorganisms, their presence, resistance and variability in different profile sections.

An analysis of the data by the descriptive statistical method.

**Results.** The research showed a total of 1241 positive results. There are more than 15 different microorganisms. The most common ones are *Ac.baumannii* (25%), *Enterococcus* sp. (10%), *E.coli* and *S.aureus* (9% each). Most cases were found in the Surgical Unit (46%) and Intensive care (22%) sections. The research explores the history of 45% women and 55% men. 43% older 66, 26% from 51 – 65, 15% from 31 – 50, 10% under 18, 6% patients 19 – 30 years old.

**Conclusion.** In general, the resistance of microorganisms in the stationary population has not increased, but definite increase in resistance to *Enterococcus faecalis*, *E.coli*, *Staphylococcus* sp. The cases of *Enterococcus faecalis* and *Ac.baumannii* have decreased significantly during the period under review. The number of *Ac.baumannii* resistant strains decreased, as well as the incidence of this microorganism in the hospital.

## BACTERIAL COLONISATION OF PLAYROOM TOYS IN A TERTIARY REFERRAL CHILDREN'S HOSPITAL

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**Keywords.** Nosocomial infection, playroom, colonisation of toys.

**Objectives.** Nosocomial infections are one of the biggest problems in medicine. A spectrum of sources of infection has been carefully studied. However, there is a lack of information about children toys as a reservoir of pathogen microorganisms in hospital playrooms. The aim is to identify and quantitatively analyse bacterial agents contaminating toys in several department playrooms of the Children's Clinical University hospital (CCUH).

**Materials and methods.** Swabs from equally large areas of 120 toys were collected between April and November 2018. Swabs were transported to Riga Stradins University Microbiology laboratory, and cultivated on blood agar, mannitol salt agar, Levine agar, Sabouraud agar for 24 - 72 h at 37 °C. Then colony forming units per square centimetre (CFU/cm<sup>2</sup>) were counted. Colonies were identified using VITEK2 method.

**Results.** At least 1 CFU grew from 100 of the total swabs. Plastic toys showed the highest average CFU/cm<sup>2</sup> (91.9), followed by wooden (34.2), and metal (2) toys. As a result, 4 genera and 37 species were identified. The highest average CFU/ cm<sup>2</sup> (65.5) was obtained from toys of the cardiology, cardiosurgery and surgery department. The gastroenterology, reumatology and endocrinology department showed an average CFU/cm<sup>2</sup> of 35.2 and the hall of CCUH: 24.7 CFU/cm<sup>2</sup>. Toys from the day hospital had an average CFU/cm<sup>2</sup> of 8.2. The most frequent pathogens were *Sphmon. paucimobilis* (> 603 CFU/cm<sup>2</sup>), *Pantoea* spp. (> 575 CFU/cm<sup>2</sup>), *Alloiococcus otitis* (> 569 CFU/cm<sup>2</sup>), *Rothia dentocariosa* (> 567 CFU/cm<sup>2</sup>) and *Kocuria rosea* (538 CFU/cm<sup>2</sup>).

**Conclusion.** Toys from cardiology, cardiosurgery and surgery department showed the highest average CFU/cm<sup>2</sup>. Most of the identified microorganisms were members of the normal microflora. Although microorganisms such as *S. aureus*, *Enterococcus faecium* and *Acinetobacter baumannii* were also identified, the obtained CFU/cm<sup>2</sup> was relatively low and all of them were sensitive to antibiotics, which overturns the assumption of toys being a risk site for nosocomial infections.

## THE ETHIOLOGICAL SPECTRUM AND LEVEL OF BIOMARKERS IN URINE AND SERUM IN PATIENTS WITH ACUTE COMPLICATED AND UNCOMPLICATED APPENDICITIS

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**Keywords.** Immunology, microbiology, appendicitis, pediatrics, biomarkers.

**Objectives.** Early diagnostics of acute appendicitis is essential to provide effective treatment for children, and therefore, there is demand for early, accurate predictive appendicitis biomarkers. The aim is to determine the most common microorganism that causes acute complicated (AcA) and uncomplicated appendicitis (AnA), as well as to determine whether serum and urine biomarkers should be included in the early diagnostic algorithm.

**Materials and methods.** Patients aged 7 – 17 were included and divided into three groups. Microbiological cultures were taken from the proximal and distal ends from all operated appendicitis cases; and from the peritoneal cavity in AcA cases. Samples were examined using blood agar, MacConkey agar, and mannitol salt agar for staphylococcal isolation. The isolated pure cultures were identified by biochemical properties using a VITEK2 analyzer. Statistical analysis was performed using Microsoft Excel 2016 and STATGRAPHICS Centurion 18.

**Results.** The highest level of LRG-1 was 22.7 ng/mL in control group. The highest level of NGAL was in AcA group: serum 169.1 ng/mL, 137.0 ng/mL, 92.5 ng/mL, and in urine 4.6 ng/mL, 9.8 ng/mL, 3.3 ng/mL. The highest level of IL-6 was in AcA group: in serum 119.3 pg/mL, 24.0 pg/mL, 13.0 pg/mL, and in urine 15.6 pg/mL, 37.5 pg/mL, and 2.1 pg/mL. The ethiological spectrum of AcA group include: fifteen with *E.coli*, seven with *P.aeruginosa*, two with *S.paucimobilis* and others. 26 peritoneal wall cultures revealed 11 with *E.coli*, two with *A.baumannii* and others. 17 culture results of AnA group revealed ten cases with *E.coli*, two with *C.braakii* and others.

**Conclusion.** The most common etiological agent is *E.coli*; in both types of appendicitis, LRG-1 production was lower than in control samples, but after the operation, their levels approached closer to normal; NGAL on day-0 also is increased in appendicitis when compared to the control group; urine IL-6 at day-0 could possibly be used as a diagnostic marker.

## IDENTIFICATION ALGORITHM FOR THE CAUSATIVE AGENT CUTIBACTERIUM ACNES OF ACNE VULGARIS

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**Keywords.** Acne vulgaris, Cutibacterium acnes (C.acnes), anaerobic bacteria

**Objectives.** Acne vulgaris is a common skin disorder. One of the most frequent causative agents, involved in its aetiology, is Cutibacterium acnes. Due to difficulties associated with growing cultures, identification of anaerobic microorganisms in patients with Acne vulgaris is not routinely performed. In the recent years, dermatologists have expressed growing concern about the lack of efficacy of antibacterial therapy in case of Acne vulgaris. A potential explanation is the emergence of antibiotic resistance of C.acnes. The aim of the study was to develop an algorithm for bacteriologic identification of C.acnes isolated from patients' specimens with Acne vulgaris to enable testing of antibiotic susceptibility.

**Materials and methods.** Samples obtained from pustules were transported to the Department of Biology and Microbiology using AMIES transport media. The specimens were cultivated on three different media, Mueller Hinton (MH), blood agar and a combined medium of Mueller Hinton and blood agar. Cultivation was performed under anaerobic conditions for 5 and 7 days at 37°C (7-15% CO<sub>2</sub>). Identification of C.acnes was performed using Vitek2 ANC ID cards by preparing bacterial suspensions with variable optical densities, 0.5 and 2.7 - 3.3 McFarland standard.

**Results.** The study included samples of 13 patients. Colony growth and Gram-positive rods on microscopic examination were observed following cultivation of samples under anaerobic conditions. Small colonies formed on both blood agar and MH media on the 7th day. Larger and more prominent colonies were present on the combined medium on the 5th day. The optimal optical density of bacterial suspension for identification using Vitek2 ANC was 2.7 - 3.3 McFarland standard. Upon identification of the Gram-positive rods using Vitek2 ANC, two samples contained C.acnes and the other six C.jejikeum.

**Conclusion.** The combined MH and blood agar medium should be used for cultivation of C.acnes; the optimal optical density of the bacterial suspension for identification of C.acnes using Vitek2 ANC ID is 2.7 - 3.3 McFarland standard.

## COMPARISON OF ANTIMICROBIAL SUSCEPTIBILITY IN URINE CULTURES FROM PATIENTS WITH URINARY TRACT INFECTIONS PERFORMED DIRECTLY AND ON ISOLATED COLONIES

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**Keywords.** Urinary tract infections, antimicrobial susceptibility

**Objectives.** Various bacteria-induced urinary tract infections are one of the most common infections associated with everyday life and health care. Proper antibacterial treatment reaches significantly higher symptomatic and bacteriological cure rate, reduces hospitalization time and side effects. The aim of the study was to compare the results of direct antimicrobial susceptibility (DST) with classical Kirby-Bauer disk diffusion susceptibility (AST), highlighting reliability of the results.

**Materials and methods.** The study was carried out at the Microbiology Department of Laboratory Medicine Centre of Riga East Clinical University Hospital. Urine samples, sent for microbiological testing, were inoculated on UTI4 agar plates, incubated 18 – 24 h, bacteria count (CFU) was detected and identification of bacterial species was performed.

In case of positive urine culture, antibacterial susceptibility tests were performed in parallel with 2 methods. DST was performed directly from the primary urine on chromogenic Mueller-Hinton agar and AST from the grown colonies on standard Mueller-Hinton agar by disk diffusion method.

**Results.** A total of 53 urine specimens were cultivated. Bacteriuria  $\geq 10 \times 4$  CFU/ml was detected in 49 samples (92%), of which 23 (47%) had  $\geq 2$  different microorganisms, and 26 (53%) one type of microorganism. Detailed antibacterial susceptibility was analyzed for 32 Gram-negative Enterobacteriaceae. Due to low number of cases, analysis for Gram-positive bacteria was not performed. Comparing DST and AST results, their 100% agreement (A) was observed for trimethoprim-sulfamethoxazole, ceftriaxone and amoxicillin-clavulanic acid, 97% with one very major error (3%) for nitrofurantoin, 97% with one minor error (3%) for gentamicin and 94% with two minor errors (6%) for ciprofloxacin.

**Conclusion.** DST results are reliable and show good correlation with AST results. They significantly could improve the treatment for critically ill patients. DST allows restricting use of a broad-spectrum antibiotic for susceptible strain to choose target treatment tactics in case of resistance (ESBL 28%).

## MICROORGANISMS ASSOCIATED WITH LEAD-RELATED INFECTIVE ENDOCARDITIS IN PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Microorganisms, Lead-related endocarditis, Endocarditis.

**Objectives.** Background. Today cardiac implantable electrical devices (CIED) remain as a mainstay treatment of bradycardias, chronic heart failure and different dangerous heart rhythm disturbances. These devices improve life quality and increase longevity of many patients, however CIED lead-related infective endocarditis (LRIE) remains a serious life-threatening infection, which may lead to grave consequences. Detection of causal organism is crucial to successive treatment of LRIE. The aim is to evaluate LRIE causal microorganisms in Pauls Stradins Clinical University Hospital.

**Materials and methods.** The retrospective study has evaluated patients, who were referred to Pauls Stradins Clinical University Hospital due to LRIE, for lead extraction. Lead extraction was performed surgically or transvenously. Causal microorganisms were cultivated either from blood, leads or device pocket. IBM SPSS v22.0 software was used for data analysis.

**Results.** Forty-nine patients with LRIE were selected for this study. The mean age was  $60.8 \pm 17.2$  years, 69.4% (n = 34) were male and 30.6% (n = 15) were female. 65.3% (n = 32) of patients have received antibiotics prior to sample extraction. Positive culture results were seen only in 63.3% (n = 31) of cases. Nearly all patients had single causal bacterium, while two had multi-infection with 2 causal organisms. Most commonly isolated bacteria were *S. aureus* and Coagulase-negative staphylococci, with similar occurrence frequency – each accounting for 23.5%. Other less frequently isolated microorganisms were *Ps. aeruginosa* accounting for 4% and *E. coli*, *Acinetobacter* spp., *E. faecalis*, *Salmonella* spp., *E. gallinarum*, *Klebsiella pneumoniae* and *S. hominis* – each accounting for 2%.

**Conclusion.** In our study 47.7% of LRIE were caused by *S. aureus* coagulase-negative staphylococci, which is similar to other studies. Other bacteria were seen considerably less frequently.

## FOSFOMYCIN AS A POTENTIAL TREATMENT FOR URINARY TRACT INFECTIONS CAUSED BY BIOFILM PRODUCING E.COLI

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**Keywords.** Biofilm, Fosfomycin, E. coli, ESBL

**Objectives.** E.coli is the most frequent cause of urinary tract infections (UTI). Many E.coli are extended spectrum beta – lactamase (ESBL) producers, having a resistance to most beta-lactam antibiotics. E.coli commonly forms biofilm that makes bacteria more resistant to antimicrobial agents. Fosfomycin is recommended for the treatment of UTI caused by multi drug-resistant bacteria. The aim of the study is to determine the effect of fosfomycin to planctonic and biofilm forming E.coli cells.

**Materials and methods.** 66 E.coli strains from patients with UTI were used. Antimicrobial susceptibility was determined by EUCAST 9.0. Biofilm production was detected using 96 – well microtiter plates. Antimicrobial minimal inhibitory concentration (MIC) and minimal biofilm eradication concentration (MBEC) was detected using 96 – well microtiter plates with peg lids. Antimicrobial effect of fosfomycin sodium (LTD ERN, Spain) was detected using microdilution from 1024 mg/l to 2 mg/l. Biofilm production and antimicrobial effect was determined by well optical density.

**Results.** Out of 66 E.coli strains 41 (61 %) were significant biofilm producers. ESBL production was detected in 13 (20 %) strains. For testing 4 significant biofilm producing strains were used. Among two non ESBL E.coli strains MIC and MBEC of 021U was 4 mg/l, 512 mg/l and of 01206UR it was 32 mg/l, 512 mg/l, respectively. Among two ESBL E.coli strains MIC and MBEC of 01020UR was 16 mg/l, 256 mg/l and of 01183UR it was 32 mg/l, > 1024mg/l, respectively. MIC/MBEC ratio of 021U, 01020UR, 01183UR, 01206UR was 128, 16, > 32 and 16.

**Conclusion.** Significant biofilm production among E.coli strains was detected commonly. All four E.coli strains were sensitive to fosfomycin. In three strains fosfomycin could eradicate bacterial biofilms with concentration greater than 256 mg/l. In ESBL positive strain 01183UR MBEC was not reached by the maximum concentration of 1024 mg/l. According to fosfomycin sodium pharmacokinetic MBEC in serum can be partly reached, but MBEC in urine can be reached. Fosfomycin sodium is a promising agent in case of biofilm associated UTI.

## PUBLIC HEALTH, OCCUPATIONAL MEDICINE, NUTRITIONAL SCIENCE, REHABILITOLGY

### ASSESSMENT OF CARDIOVASCULAR RISK IN LATVIAN PATIENTS USING SCORE PROTOCOL

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**Keywords.** SCORE, cardiovascular risk, general practitioner.

**Objectives.** Systematic Coronary Risk Evaluation (SCORE) system has been developed in order to assess the 10-year risk of death due to cardiovascular disease. The main aim was to analyze and estimate SCORE in Latvian patients. Special interest was in patients that are 50 years old or younger, because as earlier the disease is diagnosed, the better results could be achieved in treatment. Therefore, premature disability or death could be prevented.

**Materials and methods.** From June 2018 Latvian Ministry of Health designed an early coronary disease assessment program based on SCORE. SCORE protocol was issued to general practitioners. It was used as a base in this research. Forty, forty-five, fifty, fifty-five, sixty- and sixty-five-years old patients were selected and interviewed in this research. Health assessment and analyses were done. SCORE calculated. Results were analyzed using IBM SPSS Statistics 23 program.

**Results.** This is an ongoing study. 47% of 57 patients are younger than 50 years and 59% of them have elevated SCORE level. Four factors have been taken to evaluate correlation with elevated SCORE level of these patients. As the result, BMI above 25 – 81.3%; elevated total cholesterol – 62.5%; elevated blood pressure – 50%; 25% of these patients are smokers. Pearson correlation showed a two-sided correlation between elevated BMI and elevated SCORE level ( $p = 0.004$ ). ROC curves showed that elevated BMI is the most informative value factor with the confidence interval 0.578 – 0.962 ( $p = 0.019$ ).

**Conclusion.** More than 50% of 40 – 49 years old patients have increased risk of cardiovascular incident and the main reason for that is increased BMI level. Research needs to be continued to involve more patients. It is obvious that cardiovascular diseases are “getting younger” because of an unhealthy lifestyle. It is possible to prevent this risk factor even without the use of medicaments.

## DIFFERENCES OF ELECTRONIC PRESCRIPTIONS IN CROSS-BORDER HEALTHCARE IN THREE SELECTED COUNTRIES OF THE EUROPEAN UNION

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**Keywords.** Cross-border healthcare, electronic prescriptions, e-Health, EU law.

**Objectives.** Electronic prescriptions are part of cross-border healthcare allowing people to acquire medical care and medications while traveling across the European Union (EU), however countries face challenges when recognizing them in other EU Member States. The aim of this study was to analyze the legal framework of electronic prescriptions under EU law, compare process and functions of electronic prescription system in selected countries.

**Materials and methods.** Three different countries: Estonia, the Netherlands and the United Kingdom were included to determine the similarities and differences in the accessibility of medications in terms of cross-border healthcare from patient point of view. Materials were selected from EU legal documents, European Commission, international and national publications including ministry and National Health Service reports. Legal framework of cross-border e-Health systems according to the EU law was developed based on what detailed country analysis was performed with a focus on the operation of health care and electronic prescription systems in each selected country.

**Results.** Obtained data indicated that there are various advantages and challenges of the electronic prescription system on national level and they differ among chosen countries. Data analysis showed that more effective electronic prescription system from patient perspective is in Estonia, where access to the medication and pharmacy service is well organized.

**Conclusion.** Systems of electronic prescriptions are different in Estonia, the United Kingdom and the Netherlands, which is related to diverse national health policies leading to disharmonized cross-border systems for recognizing electronic prescriptions in other EU countries. Structural reforms are needed for the implementation of harmonized and sustainable cross-border electronic prescription system while securing access to medication and medical services to all EU citizens.

## ANTIBIOTIC PRESCRIPTION QUALITY AND ADHERENCE TO ANTIBIOTIC TREATMENT GUIDELINES IN A RURAL GENERAL PRACTICE

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**Keywords.** Primary healthcare, antibiotic treatment guidelines.

**Objectives.** Antibiotic prescription and its associated parameters such as the number of antibiotics prescribed and prescription adherence to guidelines is an important marker of health care quality, especially in an age of rising antibiotic resistance. Primary health care doctors are the main prescribers of antibiotics, particularly so in rural areas, where general practitioners face many challenges. The study aims to evaluate the quality of antibiotic prescription in a rural general practice by assessing the adherence to antibiotic treatment guidelines.

**Materials and methods.** A cross-sectional study was designed. European antibiotic prescribing quality indicators (APQI) were applied when studying patient medical histories in a rural general practice. Each consultation and concurrent episode of antibiotic prescription during a one-year period from October 2017 to September 2018 was analysed for seven acute infectious diseases (otitis media, sinusitis, tonsillitis, upper respiratory tract infection (URTI), bronchitis/bronchiolitis, pneumonia, cystitis). All statistical analysis was carried out with SPSS 23.0

**Results.** Out of a total of 2057 patients registered in the practice, 1289 visited their GP during the time period studied, which made for a total of 6384 visits, 870 of which were related to an APQI diagnosis. The highest consultation incidence was for URIs (186 per 1000 registered patients per year) and the highest number of antibiotic prescriptions per 1000 patient years was for tonsillitis and bronchitis (75 and 65 respectively). The most commonly prescribed antibiotic was amoxicillin (50.6%, N = 334). The percentage of patients prescribed an antibiotic was within the proposed range for most diagnoses except otitis media, sinusitis and tonsillitis (68.2%, 33.3%, 88.0% accordingly), whereas the percentage of patients who were prescribed a recommended antibiotic did not reach the proposed range ( $\geq 80\%$ ) for any of the diagnoses except sinusitis (100% received the recommended antibiotic). The only diagnosis that exceeded the recommended 5% prescription rate of quinolones was cystitis (23.1% receiving quinolones).

**Conclusion.** APQI values show that although some criteria like the prescription of quinolones are mostly within the proposed range, many indicators within the studied rural general practice, especially the prescription of antibiotics according to guidelines, are lacking, and thus there is room for improvement in the quality of antibiotic prescription.

## ASSOCIATION BETWEEN LEVOTHYROXINE THERAPY WITH QUALITY OF LIFE AND TREATMENT SATISFACTION IN PATIENTS WITH HYPOTHYROIDISM

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**Keywords.** Hypothyroidism, quality of life, levothyroxine, treatment satisfaction, thyroid-related symptoms.

**Objectives.** Thyroid hormone therapy is significantly associated with improvements in thyroid-related symptoms and in general quality of life (QoL), but sometimes patients may be symptomatic despite adequate levothyroxine therapy, which influences both QoL as well as patient satisfaction with treatment. The aim of the study was to determine association between hypothyroid-related symptoms in patients, who are receiving levothyroxine treatment, their QoL and treatment satisfaction.

**Materials and methods.** In this cross sectional study were included 41 patients (6 male, 35 female; 22 – 83 years, mean age 58.9, interquartile range = 32.5), treated with hypothyroidism (43.9% had previous thyroid surgery, 56.1% diagnosed with Hashimoto thyroiditis) at Pauls Stradiņš Clinical University Hospital and Riga Eastern University Hospital from November 2018 to January 2019. Patients completed a thyroid-specific QoL and treatment satisfaction questionnaires. We assessed thyroid-related symptoms and blood thyroid function tests (TSH and fT4).

**Results.** Patients reported negative influence of hypothyroidism on QoL, especially on weight (65.9%), physical capabilities (63.5%), physical appearance (63.4%), energy (58.5%), working life (53.6%). Despite levothyroxine therapy some patients reported fatigue (68.3%), weight gain (53.6%), dry skin (51.3%), feeling cold (34.2%), poor memory (34.1%) and concentration (31.7%), muscle weakness (24.4%) and aches (7.3%). Good QoL reported 56.1% of respondents, but bad – 22%, the remaining part reported their QoL to be “neither good nor bad”. Patients were most satisfied with convenience of treatment (73.2%) and less satisfied with understanding of their disease (36.6%).

**Conclusion.** Patients had poorer QoL if they had several thyroid-related symptoms and multiple medical conditions. In general, main part of patients was satisfied with convenience of treatment. The correlation between serum hormone level (fT4 and TSH) and QoL score was not statistically proved.

## ANTIOXIDANT CAPACITY AND ACTIVITY IN APPLES GROWN IN LATVIA IN 2017 AND 2018, A COMPARISON

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**Keywords.** Antioxidants, apples, polyphenols, DPPH, FRAP.

**Objectives.** Apples are source antioxidants beneficial for health, also of one of the most commonly grown and affordable fruits in Latvia. The study aim was to determine the antioxidant capacity and activity in vitro in several common apple varieties grown and harvested in Latvia in 2017 and 2018.

**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 3 assays: total polyphenol status (Folin-Ciocalteu method), radical scavenging ability in vitro radical generating model system (DPPH) and ferric reducing antioxidant power assay (FRAP). 6 samples of apple cultivars and industrially made mixed juice in 2017 and 5 samples of apple cultivars in 2018 were analysed.

**Results.** Among selected samples in 2017, 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, but "Auksis" showed an average result with 1.267 mg/ml GSE. In 2018, the highest polyphenol content was determined for "Auksis", 1.287 mg/ml GSE, with similar results as in 2017, but the lowest value was determined for "Delikatese" – 0.787 mg/ml GSE (a decrease by 1.067 mg/ml GSE). The polyphenol content in "Tiina" was lifted, reached 0.986 mg/ml GSE in 2018. There was no significant difference in polyphenol content between two samples of the same cultivar from different orchards. The radical scavenging ability determined with DPPH method as well as ferric reducing antioxidant power showed a strong correlation with total polyphenol status.

**Conclusion.** The polyphenol capacity in "Auksis" was average compared to other cultivars in 2017, but it remained similar the following year opposed to other cultivars. The results suggest that antioxidant capacity differ significantly among years and the cultivar with average score shows more stable results, but further research is required.

## BURNOUT SYNDROME PREVALENCE IN HEALTHCARE PROFESSIONALS IN AMBULATORY CARE UNITS COMPARED WITH AMBULANCE WORKERS

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**Keywords.** Burnout syndrome, occupational medicine.

**Objectives.** Burnout syndrome is a major problem among healthcare professionals nowadays. It is defined as combination of three factors: emotional exhaustion, depersonalization (in this case – cynism or overall negative feelings towards patients and/or colleagues) and reduced satisfaction with oneself and/or job. This situation has a negative impact both on professional and private areas of person's life. Our goal is to find out if ambulance workers are most likely to get burnout syndrome than healthcare professionals who work in ambulatory care units, as well as find out if there are any correlations between burnout syndrome and age, sex, work experience, average work load, education level.

**Materials and methods.** This is cross-sectional study. Respondents filled out the online or printed out anonymous survey based on abbreviated Maslach burnout inventory. The results were collected and analyzed by Microsoft Excel and SPSS programs.

**Results.** There were 93 participants included in the survey, 62 of whom are ambulance workers (66.7%) and 31 – ambulatory care unit workers (33.3%). 14 participants were doctors (15.1%), 38 – nurses (40.9%) and 41 – nurse assistants. (44%) The results show that ambulance workers are most likely to get burnout syndrome: 37.1% of these respondents have burnout syndrome ( $p = 0.011$ ); at the same time among ambulatory care workers this situation was observed only in 9.7% of cases ( $p = 0.011$ ). There is strong correlation between work experience and burnout syndrome – more experienced workers are more likely to get burnout ( $p = 0.048$ ). There is no statistically significant correlation between other factors included in this study and burnout syndrome.

**Conclusion.** Scientific research concludes that ambulance workers are more likely to get burnout syndrome (37.1%,  $p = 0.011$ ) than healthcare professionals from ambulatory care (9.7%,  $p = 0.011$ ). Also work experience in healthcare has statistically significant correlation with burnout syndrome ( $p = 0.048$ ).

## COMPARISON OF GINKGO BILOBA PILLS POWDER EFFECT ON LIPASE ACTIVITY WITH AND WITHOUT BILE

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**Keywords.** Obesity, overweight, lipase, ginkgo biloba, bile.

**Objectives.** Obesity and overweight are defined by the WHO as abnormal fat accumulation that presents a risk to health. WHO reports that in 2016, 39% men and 39% of women over 18 were overweight and 11% and 15% were obese. Despite pharmacology achievements, we can find many alternative approaches discovering natural drugs to treat them. We found some research topics about Ginkgo Biloba (GB) and non-traditional lipase inhibition effect. This study aim was to investigate the effect of pills powder on lipase activity comparing situations with bile and without.

**Materials and methods.** We used GB extract obtained from Tanakan and GinkoPrim pills powder. All pills considered 40 mg GB with 24% ginkgo flavone glycosides and 6% terpene lactones. Firstly, for control, we imitated physiological model using milks triglycerides, pancreatic lipase and bile. The second control model was without bile. For experimental series we added 15 and 30 mg of both extracts, diluting them in water and 60% ethanol and after incubate 1 hour in 38°.

**Results.** Maximal activation of pancreatic lipase in normal physiological condition presented 30 mg Tanacan GB extract diluted in water – on 31%; without bile the same extract and condition – 189%. Respectively, GinkoPrim extract in dose 30 mg showed the opposite effect, diluted in water in physiological condition – inhibition 180% and without bile 76%.

**Conclusion.** The received data showed that a Tanacan GB extract activate lipids hydrolysis in normal digestion with bile and without, but GinkoPrim extract showed strong inhibition of lipid digestion in duodenal model and can be recommended for the reduction of triacilglycerol's anabolism.

## DATA PRECISION AND RELIABILITY ANALYSIS OF THE USE OF SMART DEVICES FOR IDENTIFYING HEALTH RISK FACTORS FOR CARDIOVASCULAR SYSTEM

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**Keywords.** Health monitoring, PPG, ECG.

**Objectives.** The application and development of the wearable sensor device segment has hidden potential for ubiquitous and long-term monitoring of vital signs (e.g. cardiovascular system vital signs). This may improve early disease detection, leading to a preventive healthcare treatment model. Most sensors currently available are designed for consumer electronics devices. Although not designed with health applications in mind, these sensor nodes can be repurposed without adversely affecting their original function. One of such example may be on-body worn devices used for heart data harvesting and analysis. The aim of the study was to analyze the devices available on the market and classified under two sensor categories (ECG and PPG) for data reading precision in order to define its future potential for further studies and applications in biomedical data acquisition.

**Materials and methods.** The heart rate data of popular wearable devices and clinical devices certified by the International Standardisation Organization have been compared. A set of practical experiments have been conducted and a web-based framework for heart-rate data acquisition, visualization, and analysis have been created, in order to study the harvested data precision in comparison with the ISO-certified clinical device Vyasis Healthcare Master Screen CPX.

**Results.** After conducting the study, the authors were able to export data from 5 out of 6 devices tried in the experiments. The cardiac data from the Garmin Fenix 3 HR, Garmin Freerunner 35, Polar m400, and Fitbit Charge 2 was successfully exported and compiled. The most accurate device of the experiment was the Garmin Freerunner 35. It uses the Garmin Elevate™ photoplethysmographic sensors. Data mining was consistent and undisturbed throughout the experiment. While the data obtained by the Polar m400 and Garmin Freerunner 35, can be recognized as accurate as 97.99% on a device based on the above facts and the coincidence of 100% data acquisition points with the device. All the devices used in the experiment from which data could be exported worked with more than 92% accuracy.

**Conclusion.** The results obtained grant conclusions on whether the data from the heart rate sensors of smart devices are accurate enough to be used to identify health risk factors. The experiment results will be used to further evaluate on-body worn devices for other studies, involving aggregation of massive vital signs from cohorts of participants for potential analysis and correlation studies.

## DEVELOPMENT OF HEALTH POLICY RECOMMENDATIONS TO REDUCE HIGH PREVALENCE OF DENTAL DISEASES IN THE REPUBLIC OF GHANA

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**Keywords.** Oral health, healthcare system, action plan, strategy, policy recommendations.

**Objectives.** One of the main pressing issues in Ghanaian healthcare is the high prevalence of dental diseases within the population. This is caused by inadequate oral hygiene, inadequate treatment and rehabilitation, and unpractised dental disease prevention. The aim was to develop health policy recommendations to improve the oral health status of the population and the efficiency of oral healthcare services in the Republic of Ghana.

**Materials and methods.** Available literature and published studies have been studied. An indebt analysis of information and secondary data reflecting the oral health status of the population, as well as the availability, financing and governance of healthcare in the Republic of Ghana was conducted. A problem diagnostic tree was constructed to evaluate the functioning of the system and provide the base for action plan development at each level of the healthcare system.

**Results.** A high prevalence (96%) of dental diseases among the population of Ghana has been established. Ghana is suffering from a significant deficiency of oral health personnel and outdated technologies and facilities. There is a substantial insufficiency of financing of the healthcare sector (US \$ 79.6 per capita) and an evident lack of policies and strategies governing the system. Consequently, it struggles in the achievement of all the health system goals in the WHO HS framework. There is no equity in health or financing, lack of financial protection, limited responsiveness to patient needs. National oral health policies should incorporate the need for universal coverage, equity and distribution of dental workforce of all types in both urban and rural areas, as well as an adequate governance of the NHIS and restructuring of the financing system.

**Conclusion.** Improvement of the oral health status of Ghanaian citizens to reach the Sustainable Development Goals and WHO Goals should be based on a long term National oral health prevention programme including various recommendations at policy, strategy and action plan level.

## EFFICIENCY OF REHABILITATION FOR PATIENTS WITH MIOFASHIONAL SYNDROME

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**Keywords.** Myofascial pain syndrome, rehabilitation, soft tissue techniques, amplipulse therapy, numerical analog scale.

**Objectives.** To understand better medical rehabilitation as the process of medical diagnostics, it is very important to get to know the idea of principles that recovery therapy, its terms, course and sequence are based on. Nowadays the advantageous use of nonpharmacological technologies is generally approved and obvious. They help to shorten patient recovery time significantly, prevent the development of complications, and respectively reduce disability risk level after the disease. The work of practitioners who deal with rehabilitation of patients with myofascial pain syndrome is directed to increase patient functional reserves, correct and compensate disturbed functions, recover decreased working functions, as well as prevent repeated diseases and their complications. The aim of the study was to examine the effectiveness of nonpharmacological technology use for patients with myofascial pain syndrome

**Materials and methods.** There were two research groups made - experimental (I group) with 43 patients (29 - women, 14 - men) and control (II group) with 42 patients (28 - women, 14 - men). The rehabilitation nonpharmacological technologies were applied only to the patients of the I group. Numerical analog scale is 11 grade scale where pain intensity is displayed with numbers from 0 to 10. Pain is determined as intense or very strong, if the patient marks number 7 or higher, numbers 4-6 correspond to moderately strong pain and not very intense pain is marked by number 3 or lower. Multidimensional pain assessment scale that was used during the research showed not only the pain intensity but also its influence on functional capacity and life activity of the patients. The treatment complex including soft tissue techniques, exercises, amplipulse therapy (course 10 times) that refer to rehabilitation technologies was provided to selected group of participants.

**Results.** It was found that at the beginning of the research I group pain characteristics according NRS were more intense than those of the II group. The most significant difference according to Student criteria that shows the effectiveness of described rehabilitation technologies, is shown while comparing pain intensity in I group at the beginning and at the end of research. All the pain intensity indicators are lowered that obviously demonstrates the decrease of pain intensity. The pain intensity of the II group patients, where rehabilitation technologies were not applied, even increased in several positions at the end of the research. It proves the effectiveness and usefulness of the rehabilitation technologies.

**Conclusion.** Rehabilitation technologies used during the research showed statistically significant decrease of the pain syndrome in all the indicators of NRS pain intensity scale that proves the effectiveness of the rehabilitation method used.

## EVALUATION OF ANTHROPOMETRIC AND PLASMA PARAMETERS OF JUNIOR SCHOOL AGE CHILDREN IN LATVIA

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**Keywords.** Anthropometry, plasma parameters.

**Objectives.** Regular measurements of weight, height, including BMI plotting on growth charts are important tools in monitoring children health and nutritional status. Rapid increase of obesity in children and adolescents is alerting health problem. Prevalence of metabolic syndrome is increasing in parallel with increasing obesity rates. 85% obese children become obese adults. Early detection and treatment is likely to reduce morbidity and mortality from cardiometabolic diseases. The aim of this study was to evaluate anthropometric and plasma parameters of children in order to assess amount of the risk group of metabolic syndrome in junior school age children.

**Materials and methods.** 96 children (age 9 – 10 years) from 13 schools in Latvia were enrolled in the study. Anthropometric data and blood pressure were measured with standard procedures. Children were divided in two groups with overweight/obesity (N = 32) and the second group with normal BMI/underweight (N = 64) based on WHO BMI percentile scale. Triglyceride, high density lipoprotein and glucose levels were determined by E.Gulbis clinical laboratory. Estimated parameters using International Diabetes Federation criteria of metabolic syndrome in children were compared in both groups. Data were processed with R Studio. Normality of each value was tested using Shapiro Wilk test. P values < 0.05 were considered to be statistically significant, data represented as mean ± STDEV.

**Results.** There was a significant difference between normal/underweight and overweight/obesity group in BMI:  $16.25 \pm 1.41$  vs.  $22.31 \pm 2.95$  kg\*m<sup>-2</sup>; WC:  $58.44 \pm 4.17$  vs.  $72.5 \pm 9.18$  cm; Systolic BP:  $97.86 \pm 10.54$  vs.  $105.09 \pm 10.04$  mmHg; Diastolic BP:  $64.3 \pm 7.82$  vs.  $70.56 \pm 8.52$  mmHg; glucose:  $4.65 \pm 0.41$  vs.  $4.87 \pm 0.49$  mmol/l; TAG:  $0.64 \pm 0.26$  vs.  $0.80 \pm 0.31$  mmol/l. Three participants have 2 IDF criteria of metabolic syndrome.

**Conclusion.** 1/3 of investigated children are overweight or obese. Three of them have increased risk of metabolic syndrome, but others have metabolic healthy obesity. Parameters of BMI, WC, TAG, BP and glucose are significant higher in obesity/overweight group than in the normal/underweight group.

## EVALUATION OF HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH METABOLIC SYNDROME

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**Keywords.** Metabolic syndrome, health-related quality of life.

**Objectives.** The Metabolic syndrome (MS) comprises the clustering traditional cardiovascular risk factors and is highly associated with increased risk of cardiovascular disease but this can be avoided or controlled to avoid acute events. Not only adequate medication, lifestyle changes but also patient compliance are important in therapy. Patients who are not satisfied with their life are less sympathetic and therapy will not be as effective as it could be. The aim of the study was to investigate the health-related quality of life (HRQoL) in MS patients.

**Materials and methods.** Cross-sectional study. Data of 214 MS inpatients of Pauls Stradins Clinical university hospital and Gailezers hospital aged 54 – 81 were analyzed. Quality of life enjoyment and satisfaction questionnaire by J.Endicott, valid Latvian version was used to access HRQoL. Statistical analysis was performed by IBM SPSS Statistics 22.0.

**Results.** 104 patients entered the study (62 were females, 42 – males). The average age was  $67.88 \pm 5.26$  SD. It was statistically significant impact of MS to HRQoL. Physical health domain has statically significant impact to other domains: inversely associated with mood, work, household activities, vision in terms of ability to do work or hobbies, overall sense of well being, overall life satisfaction and contentment during the past week (all criterions –  $p < 0.001$ ). There was no correlation between overall life satisfaction and social relationships ( $p < 0.001$ ). Between mood and overall sense of well being there was statistically significant correlation ( $p < 0.001$ ). There was also statistically significant negative correlation between age and percentage maximum possible score ( $p < 0.001$ ). Males has statistically significant worse quality of life comparing with females ( $p = 0.024$ ).

**Conclusion.** Present study has shown significant association between MS and the worsening of HRQoL. The contribution of the this research was to accentuate the effects that the MS can have on HRQoL, in an effort to improve prevention and treatment approach for MS since MS is still an important public health issue.

## FATAL ROAD TRAFFIC ACCIDENTS IN LATVIA, 2016: CHARACTERISTICS AND POST-MORTEM FINDINGS OF DRIVERS AND PASSENGERS

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**Keywords.** Forensic autopsy, fatal vehicle crashes, road traffic accidents.

**Objectives.** 158 people died during 2016 in fatal vehicle crashes. Almost half of whom (71) were drivers and passengers. Official statistical data does not provide detailed analysis about traumatic injuries and thus the aim of this study is to characterize fatal road traffic accidents and traumatic injuries of drivers and passengers based on autopsy findings.

**Materials and methods.** A total of 69 autopsy findings from 59 vehicle crashes that happened in year 2016 were analysed in State Centre for Forensic Medical Examination of the Republic of Latvia.

**Results.** 52.5% (n = 31) were single-vehicle crashes, 44.1% (n = 26) – two vehicle and 3.4% (n = 2) three-vehicle crashes. 79.7% (n = 47) happened on state roads. At the place of accident died 71.0% (n = 49). 81.2% (n = 56) were men, 62.3% (n = 43) were drivers. Mean age for drivers was 47 years (SD ± 18.09), passengers – 34.88 (SD ± 24.06). 97.1% (n = 67) died from traumatic injuries and 2.9% (n = 2) from acute disease. For drivers and passengers, the most common was thoracic trauma, in 90.7% (n = 39) and 96.2% (n = 25) of cases accordingly. The second most common trauma for drivers and passengers was head trauma – 76.7% (n = 33) and 92.3% (n = 24) accordingly. For men and women, the most common was thoracic trauma in 91.1% (n = 51) and 100% (n = 13) accordingly. Neck trauma was more common in men – 58.8% (n = 10) and passengers – 64.7% (n = 11), (p < 0.05). Upper/lower extremities trauma was more common in two-vehicle crashes – 58.5% (n = 31) (p < 0.001). Pelvic trauma was also found to be more common in two-vehicle crashes – 75.0% (n = 12) (p < 0.05). Abdominal traumatic injuries were more common among following age groups: 21 – 24 (17.4% n = 8), > 65 (17.4%, n = 8), 25 – 29 (13.0%, n = 6), (p < 0.05).

**Conclusion.** More than a half of fatal road traffic accidents were single-vehicle crashes and happened on state roads. Most common trauma for drivers and passengers was thoracic trauma. These and other factors might be considered as important markers when implementing road safety measurements in future.

## EVALUATION OF THE SOMATIC HEALTH AND MOTIVATION FOR SPORT AMONG CADETS AND CORRELATION BETWEEN THESE TWO PARAMETERS

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**Keywords.** Military personnel, physical fitness, anthropometric characteristics.

**Objectives.** The basic task of National Defence Academy of Latvia is to prepare military personnel and it is important to keep trained cadets healthy. In order to ensure the effective realization of goals in the education of cadets, the objective research is necessary. The aim of the study was to estimate somatic health level and motivation for the sport of cadets and investigate the correlation between these two parameters.

**Materials and methods.** The study examined data from 177 cadets (n = 160 [90.4%] males and n = 17 [9.6%] females, aged from 19 to 30 years). Motivation for the sport was determined by E. A. Kalinin method, and level of somatic health was estimated by G. A. Apanasenko test and skinfold thickness measurements. All data were analyzed by IBM SPSS.

**Results.** Results show that the largest number of cadets have sports motivation which belongs to lowered and optimal level. Level of somatic health predominantly is medium. Blood pressure measurements revealed that 50 subjects [28.25%] had a high normal level and 37 subjects [20.9%] had systolic blood pressure that is more than 140 mmHg. Median body fat percentage of cadets was 22.2% (SD 5.15). A correlation between systolic blood pressure and body mass index with coefficient 0.335 ( $p < 0.01$ ) was detected. Furthermore, a compelling association was noticed between the percentages of body fat and recovery time after physical exertion with coefficient 0.206 ( $p < 0.01$ ). Body fat percentage of cadets was found to have a negative correlation with average dynamic muscle strength with coefficient -0.312 ( $p < 0.01$ ).

**Conclusion.** Based on data gathered, a significant correlation between motivation for sport and somatic health level of cadets was not detected. Level of motivation for sport among cadets tends to decrease with each next year of study.

## FINDRISC TEST ANALYSIS IN THE POPULATION OF LATVIA

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**Keywords.** Diabetes, FINDRISC test, prevalence.

**Objectives.** According to the World health organization, the volume of incidences of type 2 diabetes (T2DM) is rising rapidly. Finnish Diabetes Risk Score (FINDRISC) questionnaire allows to estimate T2DM risk probability over the next ten years. The aim of this study is to investigate prevalence of undiagnosed hyperglycemia in Latvia and to suggest an improvement of the FINDRISC test by adding glucose level test.

**Materials and methods.** In cross-sectional study data was collected in 2017–2018 in Riga, Latvia and its region. There were 446 participants who attended Diabetic Screening Project which is a part of the Latvian Medical Student Asociations Public health`s project. The screening group was led by the head of Diabetic Screening Project who is the main author of this research.

**Results.** In this research 375 participants were analyzed, of which 59.2% were under the age of 45, 13.3% 45 – 54 years, 14.4% 55 – 64 years and 13.1% were over 64 years old. For 159 participants (42.4%) BMI was above the normal range. 31.2% of participants were with positive family history of T2DM ( $p < 0.0001$ ), and for 14.7% of participants, glucose levels in the past have been increased. Dividing FINDRISC questionnaire scale in groups, 40.8% of the participants were in a high risk of developing T2DM over next 10 years. In the low-risk group, with glucose intolerance was diagnosed only 3.2% of the population, but in high-risk group elevated glucose was found for 7.4%, showing a trend of increase. Our data suggests, that even in low-risk groups the glucose intolerance probability is significant.

**Conclusion.** The FINDRISC test is an effective method for determining patient risk of developing T2DM in over the next years. Making this test improved by adding actual glucose measurement, this test could be more successfully used as screening method in GP practices.

## HIV AND HEPATITIS C SEROLOGICAL STATUS ASSOCIATED FACTORS IN THE CONTEXT OF PRIMARY INJECTED DRUG AMONG PROBLEM DRUG USERS IN LATVIA, 2017

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**Keywords.** Problem drug use, HIV, hepatitis C.

**Objectives.** In 2017 Latvia had the highest HIV incidence rate in EU, and drug injecting was the second main mode of HIV transmission. The number of primary amphetamine users in Latvia is three times lower than the number of opioid users among problem drug users (PDUs). Opioid and amphetamine users could have different types of risky behaviours, which are associated with increased risk of infections. Better understanding of differences in risk behaviour in relation with primary used drug, could help to improve harm reduction services for PDUs. Aim is to analyse HIV and hepatitis C serological status associated factors in the context of primary injected drug among PDUs in Latvia in 2017.

**Materials and methods.** Data from 10th phase of Drug User's Cohort Study (carried out in 5 cities in Latvia, 2017) was used. Research was held by the Centre for Disease Prevention and Control of Latvia and NGO "DIA+LOGS". Cross-sectional data on 542 recruitees was retained for the analysis, while rapid testing of infectious was provided for 386 respondents. Multiple logistic regression using IBM SPSS 24.0 software was conducted.

**Results.** Amphetamine users have lower odds of sharing syringes than opioid users (aOR = 0.4; 95% CI 0.2 - 0.8) and lower odds of other injecting risk behaviours. Odds of having sex (aOR = 7.6; 95% CI 2.6 - 22.6) are higher than among opioid users, while odds of using condoms also are higher (aOR = 1.6; 95% CI 1.0 - 2.6). Amphetamine users have lower odds of HIV (aOR = 0.8; 95% CI 0.4 - 1.5) and hepatitis C (aOR = 0.6; 95% CI 0.2 - 1.5) than opioid users.

**Conclusion.** Primary amphetamine users have lower odds of injection risk behaviour and sexual risk behaviour than opioid users, as consequences risk of infection diseases also is lower.

## FLUID CONSUMPTION IN PREGNANT WOMEN IN LATVIA

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**Keywords.** Fluid, nutrition, pregnancy.

**Objectives.** Adequate fluid consumption is essential to maintaining life. Pregnant and breastfeeding women should be encouraged to increase their intake of water and other fluids to meet their bodies' needs. Beverages with high added sugar content are not recommended as they do not nourish thirst and can cause unnecessary weight gain. The aim of the study was to evaluate women's fluid consumption habits during pregnancy.

**Materials and methods.** Study was done by Rīga Stradiņš University, The Centre for Disease Prevention and Control in cooperation with World Health Organisation branch in Latvia. Pregnant women and women 5 days after labour were interviewed about fluid intake during pregnancy across maternity outpatient clinics (n = 136) and maternity hospital departments (n = 257) in Latvia during six-month period in 2017. Using original study protocol data analysis was done using statistics program SPSS ver.23.

**Results.** 393 women were included (42.2%, n = 139 pregnant, 57.8%, n = 227 till 5 days after labour). Mean age was  $28.8 \pm 5.1$  years. 55.5% women had university education, 35.6% secondary school and 8.9% elementary school education. 72.8% women consumed less than 1.5 liters of still water daily, where 23.9% consumed even less than 500 ml. There was found significant correlation between BMI and water consumption ( $r = 0.10$ ;  $p = 0.04$ ). Most popular drink in 68.7% was sweetened beverage, including lemonades, where 9.2% of women consumed it every day. 49.7% women preferred sweetened coffee and 30.3% of them consumed it daily. 62.3% women consumed tee without sugar, 43.6% preferred tee with sugar. Half of women (50.9%) did not drink fresh juice, and only 6.6% women were drinking it two times per week.

**Conclusion.** Most of pregnant women consumed less then recommended 1.5 l water daily. Most women used not recommended sweetened beverages. Women need to be better informed about fluid requirements during pregnancy.

## HAND DISINFECTION FREQUENCY BETWEEN HEALTH CARE WORKERS WORK EXPERIENCE

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**Keywords.** Hand disinfection frequency, work experience.

**Objectives.** The hands of the health care workers are one of the main mechanisms for the transmission of nosocomial infection, and proper hand hygiene can reduce the spread of infection by 40%. But medical personnel do hand hygiene half as much as it should be done. The aim of this study is to find out what is the relationship between work experience and hand disinfection in each particular situation.

**Materials and methods.** 86 health care workers, who worked at the 2nd hospital in Riga, were interviewed for hand disinfection frequency, using an anonymous questionnaire with processed and analyzed data obtained.

**Results.** 43 nurses and 43 nursing assistants were interviewed. There is no statistically significant difference between the work experience and the frequency of hand disinfection – after contact with a wound; after direct contact with the patient; before invasive procedures. 76% with work experience < 5 years perform hand disinfection before contact with a patient, who has a special risk of infection; 33% 5 – 10 y; 70% 11 – 20 y; 63% > 20 y ( $p < 0.05$ ). Hand disinfection before possible contamination is performed by 65% with work experience < 5 years; 17% 5 – 10 y; 30% 11 – 20 y; 50% > 20y ( $p < 0.05$ ). Hand disinfection after contact with the patient's biological material is performed by 83%, with work experience < 5 years, 67% 5 – 10 y; 70% 11 – 20 y; 100% > 20 y ( $p < 0.05$ ). Hand disinfection after removing gloves is performed by 76%, with work experience < 5years; 33% 5 – 10 y; 50% 11 – 20 y; 63% > 20 y ( $p < 0.05$ ).

**Conclusion.** Hand disinfection before contact with the patient, after removing gloves is more likely to be carried out by health care workers with work experience < 5 years, but disinfection after contact with the patient's biological material is more commonly performed by health care workers with work experience > 20 years.

## KNOWLEDGE ABOUT CHILDHOOD CANCER AND STEM CELL TRANSPLANTS AMONG MEDICINE AND DENTISTRY STUDENTS

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**Keywords.** Cancer, transplantation, leukemia.

**Objectives.** Childhood cancer is rare but it is one of the leading cause of death among children. Lately, there was a significant improvement of survival rates for many cancers, especially acute lymphoblastic leukemia. Possible cause is better treatment and greater awareness of stem cell transplantation among people. It is essential to increase general awareness and to reduce the concerns of potential donors. The aim of the study was to assess a knowledge about blood cancers in children and methods of treatment, especially stem cell transplantation among students.

**Materials and methods.** The analysis of anonymous survey given to students of medical faculties in Medical University of Białystok. The study group consisted of 284 students. Groups were represented by medicine students 195 (68.66%), subsequently dentistry students 89 (31.34%). The survey consisted of 16 questions, answers were analysed.

**Results.** Questions in survey regarded to basic knowledge about childhood cancer, blood stem cells transplantation and being registered as a potential donors. Rating scale was 0 - 14. Score among all respondents was 7.86 correct answers on average (56.16%), medicine 8.21 (58.61%), dentistry 7.11 (50.80%). Both faculties were divided according to year of study: medicine (1; 3; 4; 6 year), dentistry (1; 3; 4 year). First year 7.35 (52.55%), third year 7.57 (54.07%), fourth year 7.72 (55.17%), sixth year 9.45 (67.49%) correct answers on average. Among all students 88 (30.99%) are registered as potential donors. The number of all students registered as potential donors increases according to the year of studies: first year 14.29%, third year 25.86%, fourth year 42.86%, sixth year 43.01%. Among non-registered students 31.63% declare their registration in the future.

**Conclusion.** Awareness of childhood cancer among medical students is still insufficient. The number of registered as potential donors and knowledge increases according to the year of studies.

## LIPID PROFILE IN 9 – 10 Y.O. CHILDREN IN RELATION TO EATING HABITS AND NUTRITIONAL STATUS

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**Keywords.** Cholesterol, triglyceride, children, eating habits.

**Objectives.** According to SPKC data (2016) rates of overweight and obese 9 to 10 years old girls and boys in Latvia were 22.2% and 29.3% correspondingly and it tends to increase over years. Cardio vascular disease (CVD) is one of the leading causes of death worldwide, therefore it is of importance to evaluate health – lipid profile, nutritional status, dietary habits and physical activity, at early life. This study aim was to evaluate cholesterol and triglyceride levels in 9 – 10 y. o. children in association with eating habits and nutritional status.

**Materials and methods.** 105 children (age 9 – 10 years) from 13 schools in Latvia were enrolled in "Physical Activity and Children overall Health study" conducted by Latvian Olympic Committee and University of Latvia. Eating habits were assessed with food frequency questionnaire, cholesterol and triglyceride (TAG) levels were determined by E.Gulbis clinical laboratory and anthropometric measurements ((body mass index (BMI), waist circumference (WC)) were collected at schools by research team. Based on WHO BMI percentile scale two study groups were formed, children with normal BMI (NOR, N = 74) and overweight/obese children (OB, N = 31). Data were processed with SigmaPlot 12.0.

**Results.** There was a significant difference between the two study groups in several of measured parameters: TAG – NOR:  $0.59 \pm 0.04$  vs OB:  $0.78 \pm 0.08$  ( $p = 0.002$ ). Total cholesterol (TC) NOR:  $4.151 \pm 0.076$  vs OB:  $4.429 \pm 0.104$  ( $p = 0.044$ ). Low-density lipoprotein (LDL) NOR:  $2.284 \pm 0.07$  vs OB:  $2.60 \pm 0.099$  ( $p = 0.014$ ). No significant difference between high-density lipoprotein (HDL) NOR:  $1.530 \pm 0.04$  OB:  $1.510 \pm 0.05$  ( $p = 0.579$ ). There were significant correlations ( $p < 0.05$ ) between BMI and TAG ( $r = 0.248$ ), LDL ( $r = 0.224$ ); WC and TAG ( $r = 0.198$ ), LDL ( $r = 0.209$ ), HDL ( $r = - 0.198$ ); weight and TAG ( $r = 0.264$ ), LDL ( $r = 0.235$ ). Relations between lipid profile, eating habits and nutritional status were not found.

**Conclusion.** Study demonstrated significant changes in lipid profile between NOR and OB study groups and correlations with BMI, weight and WC, irrespectively of eating habits.

## OPINION AND PARTICIPATION OF PATIENTS WITH COLORECTAL CANCER IN COLON CANCER SCREENING PROGRAM, QUALITATIVE RESEARCH

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**Keywords.** Colorectal cancer, faecal occult blood test, qualitative research.

**Objectives.** The five – year survival rate for colorectal cancer diagnosed at an early stage is 90% compared with 5% for late stage disease. Therefore, colorectal cancer screening programme using faecal occult blood (FOB) test takes place in Latvia since 2009 to diagnose colorectal cancer at an early stage. However, during the last 10 years patients' compliance is very low – during the first 9 months of year 2018 it was only 11.5%. Objective of the study is to investigate compliance and attitudes of colorectal cancer patients towards screening program.

**Materials and methods.** A qualitative study was conducted in Rīga East University Hospital. Ten colorectal cancer patients 50 to 74 years old of various education levels were included in research. All patients have undergone recent surgery. Patients were interviewed regarding FOB test – their experience and attitudes. Semi – structured interviews were audio recorded, transcribed and analysed.

**Results.** Nine out of ten patients never participated in colorectal screening program. The main reason for that was an absence of information about the development features of colorectal oncology. Other reasons were the absence of symptoms and strong character features that caused one patient to suffer a sharp abdominal pain. The interviewees' offered option on how to improve information availability – screening program should become a compulsory test for everyone, information should primary come from a family doctor, or informational materials should be sent by post. All interviewees now are confident that the screening program is a very good thing that would help to diagnose colorectal cancer at an early stage.

**Conclusion.** Study results imply that awareness on colorectal cancer screening programme is low among colorectal cancer patients before diagnosis and rises after. Absence of information and symptoms are the main reasons for non-compliance to the FOB test.

## PARENTAL BELIEFS AND BEHAVIOUR TOWARDS VACCINATION IN ESTONIA

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**Keywords.** Vaccination, parents, beliefs, attitudes, children.

**Objectives.** Vaccine hesitancy is a growing public health concern in many countries, but evidence-based information about situation in Estonia is still missing. The aim of the study was to identify Estonian parents' beliefs and attitudes about scheduled immunization programme and to determine the sociodemographical factors associated with vaccination behavior.

**Materials and methods.** The questionnaire was carried out on the web in 2017. During month survey period in total of 1557 parents (0.1 % of Estonian population) with youngest child aged  $\leq 5$ , were enrolled. In order to identify independent risk factors associated with vaccination behavior the multiple logistic regression analysis was constructed and to measure attitudes and beliefs the Likert scale (5 degree) was used.

**Results.** Parents were categorized as vaccinators (72.3%), uncertain (11.9%) and refusers (15.8%). Parents having one child in family (vs.  $\geq 2$  child OR = 1.43; 95% CI 1.02 - 2.02) and earning lower income (0 - 800 and 801 - 1500 € vs.  $\geq 1501$  €) were more likely vaccinators than refusers (OR = 1.97; 95% CI 1.21 - 3.2 and OR = 1.96; 95% CI 1.31 - 2.92). Parents  $\geq 35$ -years (vs. 25 - 34) were more likely uncertain than refusers (OR = 1.86; 95% CI 1.30 - 2.65). Health care education was not associated with vaccination behavior. Beliefs about vaccination were significantly different in all three groups. Vaccinators compared to uncertain and refusers trust more likely physicians (89.3/46.8/9.8%) and WHO (79.7/38.2/1.2%); believe that vaccine-preventable diseases are serious (90.9/62.4/7.3%); vaccination is important (92.3/57.5/4.5%), safe (73.7/34.9/1.6%) and the benefits of vaccines weighing up the potential risk of side effects (86.3/54.8/6.5%). Meanwhile they are less likely to believe that vaccines contain dangerous substances (18.0/67.2/97.2%); children are vaccinated too early (15.6/69.4/95.9%); vaccines overwhelms or weakens the immune system (8.2/57.5/95.9%) and causes allergic reactions (11.6/51.6/93.5%) or autism (1.8/19.4/77.2%).

**Conclusion.** Vaccine safety is perceived as a concern by many parents (including vaccinators and uncertain), thus it is important to build trust in vaccination in order to prevent increase in refusal.

## PATIENT COMPLIANCE IN THE TREATMENT OF ARTERIAL HYPERTENSION

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**Keywords.** Arterial hypertension, compliance, blood pressure self-control, medications.

**Objectives.** Peripheral arterial hypertension is a disease which significantly increases the risk of other cardiovascular diseases. Nowadays the average prevalence of arterial hypertension in general population is around 30 – 45% and continues to grow with age. That is why the patient compliance in treatment of arterial hypertension should be studied. The aim of the study was to evaluate how closely the patients are following the prescribed methods of treatment for arterial hypertension.

**Materials and methods.** Overall 48 patients with arterial hypertension from Dr. Ilzes Skujas GP Practice were participating in a prospective quantitative research which was performed by questioning patients in person, determining anthropometric indicators, measuring blood pressure and pulse, as well as determining BMI. Statistical data was processed by IBM SPSS.

**Results.** From 48 total cases 58.3% (N = 28) were women and 41.7% (N = 20) were men, from whom 14.6% (N = 7) of patients have physically active work, 31.3% (N = 15) work sedentary jobs, 52.1% (N = 25) are retired. 31.3% (N = 15) of the respondent's measure blood pressure every day. Only 25% (N = 12) participants are following non-medical therapy. 89.6% (N = 43) patients use the prescribed medication, but only 68.7% (N = 33) use it every day. Half of the patients have had hypertensive crisis, but only 18.8% (N = 9) of the patients were hospitalized due to it. Analyzing anthropometric indicators – 41.7% (N = 20) are overweight, and 31.3% (N = 15) have normal body weight. A statistically significant association between sex and hypertensive crisis was established (p = 0.039). A statistically significant association between sex and blood pressure self-control was observed as well (p = 0.029).

**Conclusion.** It was observed that most of the patients are retired. Women have a better habit of blood pressure self-control. Quarter of all patients are following non-medical therapy, but more than a half – use medication every day. The hypertensive crisis was more common for women. Almost half of patients are overweight.

## PRESCRIBING PRACTICE OF MIGRAINE-PREVENTIVE MEDICINES AMONG NEUROLOGISTS

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**Keywords.** Migraine-preventive medication, evidence-based practice.

**Objectives.** Evidence-based clinical research suggests that pharmacological migraine prophylaxis might be efficient for migraine management. The aim of the study was to investigate neurologists' adherence to evidence-based practice in migraine-preventive medication prescribing in the Riga region.

**Materials and methods.** Neurologists (n = 34) from different clinical ambulatory practices in the Riga region were interviewed with the questionnaire about their clinical practice related to prescribing of migraine-preventive medicines. IBM SPSS 23.0 was used for statistical analysis.

**Results.** The average age of neurologists was 45 years, and average work experience was 18 years. 67.6% (n = 23) of participants did not prescribe migraine-preventive medications. No significant association was observed between the prescribing practice of migraine-preventive medicines and means of respondents' age or work experience. Of those not prescribing migraine-preventive medication, 47.8% (n = 11) noted having too few migraine patients, 39.1% (n = 9) reported referring their migraine patients to other colleagues specializing in migraine treatment. 17.4% (n = 4) indicated the lack of clinical trials proving the efficacy of migraine-preventive medicines as the major reason for not prescribing medications. More evidence on effectiveness would change the practice of migraine-preventive medication prescribing to only 13% (n = 3) of those neurologists not prescribing medicines at present.

**Conclusion.** This study suggests that neurologists are reluctant to prescribe migraine-preventive medications. Updates of evidence-based research on pharmacological migraine prevention should be better transmitted into clinical practice for migraine management.

## PSYCHOMETRIC PROPERTIES AND ICF CATEGORY ANALYSIS OF THE MOST COMMONLY-USED AUGMENTATIVE AND ALTERNATIVE COMMUNICATION TECHNICAL AID MEASURES: A SYSTEMATIC REVIEW

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**Keywords.** Augmentative and alternative communication (AAC), outcome measures, psychometrics, ICF.

**Objectives.** Health professionals and researchers should select the most adequate instrument based on knowledge of its measurement properties, considering the broader impact of augmentative and alternative communication (AAC) on issues such as participation, well-being and others, as addressed by International Classification of Functioning, Disability and Health (ICF). The aim of this review was to identify the most commonly used measures in AAC and those psychometric properties, determine which ICF categories are addressed by these measures.

**Materials and methods.** A comprehensive literature search was undertaken in May 2018 in 4 databases (Medline, ProQuest, ScienceDirect, CINAHL complete) for articles published between 1999 and 2018. Two independent assessors analysed the methodological quality using the COSMIN checklist. Pre-set psychometric criteria were evaluated for the most commonly used measures. Meaningful concepts of the identified measures were extracted and linked to the most precise ICF categories, a description of an instrument was used if a full version of the instrument wasn't available.

**Results.** 116 articles out of 2113 met eligibility criteria and were used for full text analysis and 189 measures were found. Most commonly used seven measures were identified (PPVT-R; 3rd and 4th edition; VABS; ADOS; Ravens matrices; MSEL; SIT). The measures demonstrated good validity and reliability amongst people with different diagnosis and demographics, no studies regarding responsiveness were found. Linking to 75 ICF categories was made, all measures address activity and participation, 4 of them – body structure and function and only MSEL addresses environmental factors.

**Conclusion.** All of the most commonly used measures had good psychometric properties, except for responsiveness in different diagnosis and population. All of the measures address different activity and participation elements. It should be noted that different measures relate to specific diagnosis and cover different functioning categories. If necessary, multi-measure assessment should be performed.

## REASONS WHY MOTHERS REFUSE TO VACCINATE THEIR DAUGHTERS AGAINST HUMAN PAPILLOMAVIRUS

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**Keywords.** Human papillomavirus (HPV) vaccine, acceptance.

**Objectives.** During last years, the immunization rate with HPV vaccine in Latvia is insufficient – 44.2% in 2016, 50.2% in 2017, 43.7% in 2018 from January to June. The aim of this study is to evaluate the most common causes why parents refuse to vaccinate their daughters against HPV.

**Materials and methods.** Women who have at least one daughter were invited to fill in a questionnaire via internet and in secondary school in Riga. Open question on reasons not to vaccinate was included. All answers were coded and codes were reviewed and organized in overarching categories describing parents' opinion against HPV vaccine.

**Results.** 219 women aged 18 – 61 filled in the questionnaire. Most of the women had a higher education 183 (83.6%) and most of them were employed 111 (48.1%), childcare leave 41 (17.7%) and selfemployed 37 (16%). 72 (34.2%) parents accepted HPV vaccine, 101 (46.1%) did not accept it and 43 (19.6%) had no opinion in regard to the vaccine. We did not find any significant correlation between parents' socio economic factors (education, occupation, income) and support for the vaccine. The most common reasons for refusing HPV vaccine are: vaccination can cause serious side effects 41 (24.3%), not been enough research done on the HPV vaccine 31 (18.3%), HPV vaccine may lead to long-term health problems 22 (13%), efficacy of the vaccine is too low and it does not protect against all types of HPV 19 (11.2%), HPV vaccine is "too new" 14 (8.3%), vaccination does not guarantee that a cervical cancer can occur 13 (7.7%).

**Conclusion.** Results of our study imply that there is still a prejudice about the HPV vaccine, especially regarding its safety.

## QUALITY OF LIFE IN MULTIMORBID PATIENTS IN PRIMARY CARE

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**Keywords.** Multimorbid patients, chronic disease, quality of life.

**Objectives.** As the mean age of population is growing, there are more patients with two or more chronic diseases (ChrD), which are called multimorbid patients (MmP). Multimorbidity has a great impact on daily activities, mood and wellbeing. 65 – 75% of general practitioners' (GP) appointment time is occupied for consulting MmP. The aim of this study is to evaluate assessment of quality of life in MmP and non-MmP.

**Materials and methods.** Patients included in study were aged 40 – 80 both genders. Each of participants completed three questionnaires – questionnaire created by authors, a short form of quality of life enjoyment and satisfaction questionnaire (Q-LES-Q-SF) and a short depression assessment questionnaire (PHQ-9). Patients with cognitive disorders were excluded. Participants were divided into two groups – MmP group and control group of patients with one or none ChrD.

**Results.** There were 118 participants (32 men, 86 women) of whom 82 were in the study group. The medium age was  $63.6 \pm 11.9$  years. The most common illnesses were arterial hypertension (64.4%), chronic back (59%) and joint pain (47.5%). Q-LES-Q-SF results were statistically significantly higher in control group (52.77 p.) than in the study group (46.62 p.). When analysing quality of life in relation to the count of ChrD, current back and joint pain assessment the Spearman's correlation rates were following: – 0.25 for the count of ChrDs, – 0.24 for back pain, – 0.36 for joint pain, all of the correlations were statistically significant. When analysing Q-LES-Q-SF between different groups, there were statistically significantly lower results in patients with unmanaged ChrDs.

**Conclusion.** Even though MmP evaluate the quality of life lower, it is important to manage the ChrDs. It is important that the GPs discuss how important it is to manage ChrDs correctly and effectively to improve the quality of life.

## RELATIONSHIP BETWEEN COGNITIVE RESERVE AND FRONTAL WHITE MATTER INTEGRITY IN HEALTHY SENIORS

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**Keywords.** Cognitive reserve, brain reserve, aging.

**Objectives.** Life expectancy and the average age in Latvia is gradually increasing and the prognosis is that by 2030 it will reach 73 for men and 82 years for women (EUROSTAT, 2016). Over the last decade, there has been an increased number of research about the cognitive reserve and it has been proposed as a mechanism to explain individual differences in rates of cognitive decline. Cognitive reserve is considered to protect against the effects of brain damage, helping the individual to cope by enlisting compensatory processes and slowing down memory decline in normal aging (Stern, 2009). On the other hand, the concept of brain reserve suggests that structural characteristics of the brain provide resilience against brain aging and pathology: either there is more brain matter to lose as a result of pathology or atrophy, or the brain substrate supports more elaborate neural networks. Brain reserve might be measured by white matter diffusivity (Stern, 2017). The aim is to examine the relationship between cognitive reserve (CR) and frontal white matter integrity (WMI).

**Materials and methods.** 44 participants aged 65 - 85 (M = 71.95, SD = 5.23) were included in the data analysis. To assess cognitive reserve accumulated by individuals through their lifespan course Cognitive Reserve Index questionnaire (Nucci, Mapelli, & Mondini, 2012) was used. High-resolution volumetric MRIs were acquired and processed for all participants to measure white matter diffusivity in the frontal lobe.

**Results.** There was no significant correlation between cognitive reserve and frontal white matter integrity ( $p > 0.05$ ).

**Conclusion.** Results indicate lack of relationship between CR and frontal WMI; however, it should be considered that, firstly, the neural mechanisms underlying reserve are optimally studied in a longitudinal study and secondly, the sample size in the present study was limited.

## SENSOR NETWORK AND SOFTWARE FOR PATIENT REPOSITIONING MONITORING AND ANALYSIS FOR PRESSURE ULCERS PREVENTION

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**Keywords.** Sensor Networks, pressure ulcers, patient monitoring.

**Objectives.** The aim of this work is to create a solution to help healthcare professionals automatize monitoring and patient supervision processes and get timely notified of a need to reposition a patient in order to avoid the risk of pressure ulcers occurrence. The system would be beneficial to the treatment process, in comparison to classical manual input of the timestamps in patient care journals, as well as price and usability wise, comparing to mattresses and dressings. Such system would help monitor the prevalence of pressure ulcers occurrence on a hospital level, providing both analytical reports on human resource management and correlating with the risk factors of occurrence.

**Materials and methods.** Implemented solution will consist of a combination of an embedded device for patient repositioning data and software for data analysis and communication with the healthcare specialists. The wearable device includes "9-degrees of freedom" sensor nodes and a communication module. The device collects data and sends them to the mobile device with an application installed. When the application receives collected data, it generates a list of patients, sorted by the time threshold, giving an automatized journaling system for healthcare specialists for timely checkup and repositioning provision.

**Results.** Work under this project is in progress – a prototype version, consisting of a combination of the embedded device has been developed to collect movement and repositioning data from a real person. Another development project is started with Suunto produced sensors with an aim to do a pilot project with a hospital facility. The device precision is calculated as > 90% – the work on algorithmic improvement is in progress.

**Conclusion.** It is recognized that collecting and understanding data on the causes of harm is a key tenet of quality improvement approaches in healthcare, where the proposed device can be of use.

## **SOCIAL ASSISTANCE AND SOCIAL SERVICES COVERAGE IN LATVIA**

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**Keywords.** Social services, assistance, regions, accessibility, regulations.

**Objectives.** Social work is most often associated with social assistance and social services. National legislation sets only a small number of social assistance and services, while others can be set up by local municipalities. Thus, among the 119 municipalities in Latvia there are different and unequal assistance politics to their inhabitants. The main purpose of research is to evaluate Social Services and Social Assistance available in Latvian cities and regions, their coverage and accessibility for people.

**Materials and methods.** Analysis of binding regulations of Latvian regions and cities. Creating a simple database to gather information about available social assistance and services. To determine the coverage of social assistance and social services in Latvia as a result of mathematical calculations.

**Results.** The results show the unequal situation with the available social services and social assistance in Latvia. The results reveal that each municipality can create unique social assistance and services, with more than 70 types of social assistance benefits and over 50 social services across the country.

**Conclusion.** The results reveal a situation that has developed in Latvia and needs to be improved to reduce people's inequality. Also Latvian local governments need to develop closer communication with the citizens to inform them of the social assistance and social services available to them.

## STROKE AWARENESS AMONG LATVIAN HIGH SCHOOL SCHOLARS

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**Keywords.** Stroke, awareness, scholars.

**Objectives.** In Latvia stroke takes third place of death causes, after cardiac causes and cancer. Therefore, it is increasingly important to educate the population about stroke symptoms and prevention, especially the younger population. Population's awareness would also speed up hospitalization time and as a consequence increase survival rate. The aim of the study was to evaluate the awareness of stroke among school children in Latvia and to understand if the population is needed to be more educated.

**Materials and methods.** To assess the scholar's knowledge about stroke ten-item questionnaire was used. The obtained data were analysed in SPSS Statistics.

**Results.** The study included 256 scholars 15 - 19 years of age. The average age 16.87, 52% females and 48% males. 96.5% of respondents admitted knowing what stroke is. Most of the scholars (62.1%) answered right, that stroke is a disease affecting blood vessels in the brain. 59.4% of participants thought that stroke can occur both suddenly and gradually. 58.2% of students named paralysis of one side of the body, 53.9% speech disorder, 52.3% sudden severe headache as the most popular symptoms of stroke. As the most common risk factors were named: stress (58.2%), high blood pressure (57.4%) and smoking (50%). Just 47.7% of respondents actually knew what acronym FAST stands for. When asked whom to call first when a stroke occurs, 97% named ambulance, however, the rest named either: general practitioner, family member, to wait or to give a pain reliever. Less than half of respondents named thrombolysis (49.6%) and thrombectomy (31.6%) as a cure. Unfortunately, just 18.4% of respondents named medical staff as a source of information about stroke.

**Conclusion.** The research has shown that Latvian scholars' knowledge about stroke is poor and is in need of education. Health-related information and skills have to be implemented from a young age.

## THE COMPARISON OF ANKLE INJURY RATE IN PROFESSIONAL VOLLEYBALL PLAYERS AND GENERAL POPULATION IN AGE FROM 18 TILL 25 YEARS

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**Keywords.** Ankle injury, occupational medicine, professional volleyball players.

**Objectives.** Ankle injury is the most frequent trauma among volleyball players. It includes ankle sprain, luxation, ligament damage and ankle bone fractures. Most frequent symptoms in case ankle injury are stiffness, intense pain, inability to walk and swelling. The goal of the research is to compare the prevalence of ankle injury between professional volleyball players and general population in the age group 18 to 25 years old in Latvia. Despite both groups are similar age the physical activity is different. Figuring out particular physical activity, shows the biggest trauma rate.

**Materials and methods.** To investigate this matter, questionnaires were used, in which both groups were asked about ankle trauma rate and type; how long professional volleyball players are doing professional sports; trauma preventive methods and others. To objectify professional volleyball players discomfort and pain level DABI index was used. That evaluates pain severity during running, jumping, landing and others. Data were processed using MS Excel 2010 and SPSS 20 programmes.

**Results.** Among 205 respondents, 101 are professional volleyball players and 104 do not play volleyball. Age ranged from 18 to 25 years. Average sportingtime for professional players is 7 hours per week, but for population – 3 hours per week. From 101 professional volleyball players – 83 had ankle trauma. From 104 people who do not play volleyball – 52 had ankle trauma. This allows to hypothesize, that percentage of professional volleyball players that had ankle trauma (82.2%) is much higher, than percentage of people who do not play volleyball (50.0%).

**Conclusion.** Results show us that professional volleyball players are in higher risk group of having ankle trauma than other population.

## THE PARENTAL PERCEPTION, AWARENESS AND REASONS FOR REFUSING INFLUENZA VACCINATION IN LATVIA

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**Keywords.** Influenza vaccination, public health, children, parental awareness, reasons for refusal.

**Objectives.** Influenza is a contagious viral infection that is common in children till 7 years old in Latvia. There is available influenza vaccination, but it is not included in Latvia Childhood Vaccination schedule. Despite vaccine availability parents refuse from it due to various reasons and there still are lethal cases in children in Latvia. The goal of the research is to figure out parental opinion, awareness and reasons for refusing from influenza vaccination in children from 6 months till 7 years old in Latvia.

**Materials and methods.** To investigate this matter, questionnaire was made which includes questions about vaccination status, chronic diseases, reasons for refusing vaccination, parental sources of information about influenza vaccine efectivity and necessaty for their children and others. 400 respondents were interviewed, 110 of them were hospitalized in Riga Children's Clinical University Hospital due to different causes. Respondents were parents whose children are in the age group from 6 months till 7 years. Data were processed using MS Excel 2010 and SPSS 20.

**Results.** Among 400 respondents 32 (8.0%) are vaccinated against influenza this season. 66 (16.5%) had ever had influenza infection, 5 of them had influenza infection this year. 166 (45.1%) of unvaccinated respondents had an opinion that influenza vaccine will not save their child from disease. 50 (13.6%) said that vaccination is too expensive. 16 (4.3%) of respondents had refused from all vaccines including influenza vaccination. 56 (14%) parents thought that influenza vaccination must be included in the Latvia Children Vaccination schedule.

**Conclusion.** Influenza is a common contagious disease and children are in risk to get this disease. Despite vaccination is available, parents not often decide to vaccinate their children. The reasons for refusing are parental doubts in influenza vaccination effectivity, vaccination price, complication and side effects and others.

## URINARY AND FECAL INCONTINENCE OF OLD PATIENTS IN SOCIAL CARE HOMES

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**Keywords.** Old patient, incontinence, social care homes.

**Objectives.** Urinary incontinence symptoms are highly prevalent among old people. In Canada (2014) was 9.8% in 65 – 74 age group, 16.6% in 75 – 84 age group and 22.3% in ≥ 85 years age group of women, who had urinary incontinence problems. Besides, in US fecal incontinence is another problem that older people often face. The aim of the study was to assess urinary and fecal incontinence of old patients in social care homes.

**Materials and methods.** This survey was carried out from April 2018 to May 2018 in one Vilnius social care homes. During the study 31 patients has been interviewed. Urinary and fecal incontinence of old patients were assessed using four questions (formulated according interRAI Long-Term Care Facility). Statistical data analysis was performed with software SPSS 20.

**Results.** The study involved 31 respondents. 16.1 % were male (n = 5) and 83.9 % (n = 26) female. The youngest respondent was 60 and the oldest – 91 years. Slightly more than two-fifths (41.9%) of the survey participants felt anxiety and they all were women (p = 0.038). Slightly more than half (51.7%) of study participants did not have urinary incontinence (p = 0.286). Almost a third (30.8%) 60 – 75 years old and twice more (61.1%) patients aged 76 to 91 years had urinary incontinence and they all used diapers or pads. Just a few (7.7%) 60 – 75 years old and a third (33.3%) of the 76 – 91 years old group patients sometimes had fecal incontinence (p = 0.211).

**Conclusion.** Statistically significant difference was found between gender and anxiety. The study showed that more elderly people (aged 76 to 91 years) had urinary and fecal incontinence compared to people aged 60 to 75 years.

## OTORHINOLARYNGOLOGY, DENTISTRY, MAXILLOFACIAL SURGERY, OPHTHALMOLOGY

### MAXILLAR SOFT TISSUE CHANGES AFTER LE FORT I OSTEOTOMY IN ANGLE III MALOCCLUSION PATIENTS

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**Keywords.** Soft tissue; Maxilla; Le Fort I; Orthognathic surgery.

**Objectives.** The visual appearance is largely determined by the surrounding soft tissue. Most studies focus on bone changes, but not on soft tissues. The soft tissue response may be difficult to determine before surgery. For patients with severe dentofacial deformations, to whom orthognathic surgery is planned, soft tissue changes are expected after surgery. The soft tissue of the middle part of the face is difficult to predict due to the back-pulling forces of the muscles. The aim was to identify and predict maxillar soft tissue changes in patients with Angle Class III malocclusion after Le Fort I osteotomy.

**Materials and methods.** Soft tissue measurements were made on 3dMd Vultus scans obtained from a database of orthognathic surgery Le Fort I Angle III malocclusion patients. Soft tissue points were placed, measurements were performed on scans taken before orthognathic surgery (T0), 6 or 9 months (T1) after orthognathic surgery for 22 subjects, age 20 – 43. Paired t-test were used to determine changes between pre-surgery and post-surgery soft tissue position.

**Results.** Biggest changes were between points sn (subnasale) and li (lower lip), where distance increased by an average of 2,03mm ( $p < 0,01$ ), and also between points sn (subnasale) and chL (chelion left) on average by 1,77mm ( $p < 0,01$ ). Distance between both lips increased by 0,928mm ( $p < 0,01$ ). Mouth width did not change. Distance between nasal alare increased by 1,554mm ( $p < 0,01$ ). Changes also occurred in the soft tissue of the lower lip.

**Conclusion.** Major changes were in the triangle area of nose alares and upper lip. This area moved forward and increased in width.

## MOST COMMON CAUSATIVE AGENTS AMONG OTORHINOLARYNGOLOGY PATIENTS WITH COMPLICATED INFECTIONS IN LATVIA, CHILDREN'S CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Otorhinolaryngology (ORL); Complicated infections; Causative agents

**Objectives.** Complicated ORL infections are generally caused by bacteria. As the spectrum of commonest pathogens may change over time, it is essential for causative agents to be reviewed regularly for adjustment of initial empiric antibiotic therapy. Complicated ORL infections are generally caused by bacteria. As the spectrum of commonest pathogens may change over time, it is essential for causative agents to be reviewed regularly for adjustment of initial empiric antibiotic therapy. The aim was determine the spectrum of most common causative agents isolated in cases of complicated otorhinolaryngologic infections among pediatric patients.

**Materials and methods.** This retrospective study was conducted by analyzing clinical records of pediatric patients with complicated ORL infections, admitted to Children's Clinical University Hospital in Latvia from 01.01.2015. to 31.12.2018. Clinical records from hospital's database "Andromeda" were reviewed. Only patients with positive cultures in laboratory-tested pus samples were enrolled. Data was statistically analysed using Microsoft Excel and IBM SPSS.

**Results.** Among 316 patients, 178 (56.33%) were males and 138 (43.67%) females, mean age was 10.02 years (range 0.24 - 17.93 years).

From 100 patients with acute suppurative otitis media, commonest causative agents found were *Staphylococcus* spp. (37.16%), mostly coagulase-negative *Staphylococci* (76.36%), and *Streptococcus* spp. (28.38%), of which *S.pyogenes* 42.86%, *S.pneumoniae* 40.48%. Results were similar among 42 of those patients with acute mastoiditis also.

Tested samples from 92 patients with chronic otitis media detected mostly *Staphylococcus* spp. (36.22%), with similar distribution of coagulase-negative *Staphylococci* (53.73%) and *S.aureus* (46.27%). Also *Corynebacterium* spp. (18.92%), *Pseudomonas* spp. (9.73%), *Streptococcus* spp. (5.95%) and others were found.

Among 20 patients with otitis externa, prevalent causative agents found were *Staphylococcus* spp. (41.28%), followed by *Pseudomonas* spp. (13.79%) and *Corynebacterium* spp. (10.34%).

Tested samples from 104 patients with peritonsillar abscess indicated that commonest pathogens were *Streptococcus* spp. (64.04%), of which *S.pyogenes* 41.23%. Also *Neisseria* spp. (9.55%), *Staphylococcus* spp. (7.30%) and other species were found.

**Conclusion.** This overview of causative agents detected in cases of otorhinolaryngologic infections demonstrates that most common bacteria found were *Staphylococcus* spp. and *Streptococcus* spp.

## CAN KINESIO TAPING IMPROVE NASAL OBSTRUCTION SYMPTOMS IN WOMEN WITH PREGNANCY RHINITIS?

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**Keywords.** Pregnancy rhinitis, Kinesio taping, Nasal obstruction, NOSE.

**Objectives.** Pregnancy rhinitis affects up to 40% of pregnant women. It is caused due to changes in hormonal background during pregnancy. Nasal congestion influences quality of life of pregnant women suffering from this condition. Kinesio taping improves lymph drainage and decreases edema, therefore it could be used as a treatment method in women with pregnancy rhinitis.

The aim of this study was to detect possible beneficial effects of kinesio taping in women suffering from pregnancy rhinitis.

**Materials and methods.** NOSE questionnaire was used to evaluate nasal obstruction symptoms before and after Kinesio Tape application. Pregnant women, complaining about nasal obstruction symptoms, were examined by ENT resident doctor at Pauls Stradins clinical university hospital. Kinesio tape was applied over the maxillary sinuses. The respondent was asked to fill the NOSE questionnaire before and three days after Kinesio Tape was being applied.

**Results.** In total 7 participants were enrolled in the study. All women were in 2nd or 3rd trimester of pregnancy (range from week 18 to 31). NOSE score median value before tape application was 60 (range from 25 to 100). After 3 days median NOSE score value diminished to 25 points (range from 0 to 65). As the most disturbing symptom respondents reported trouble of sleeping. After taping almost all women (85%) reported improvement of sleep quality.

**Conclusion.** Nasal taping showed an improvement in median NOSE score values 3 days after nasal tape was applied. That leads to conclusion that nasal taping could be an effective method to improve quality of life in women suffering from pregnancy rhinitis. To make further conclusions, more researches should be done, as well including objective evaluation of patient complaints.

## ORO-ANTRAL COMMUNICATION AND ITS TREATMENT MODALITIES

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**Keywords.** Oroantral communication; Oro sinus communication; Buccal flap; Palatal flap; PRF; Polyurethane foam.

**Objectives.** The objectives of the thesis was to analyze, and compare different modalities that can be utilized in treating oro- antral communication (OAC). Emphasis was put on treatment modalities that can be utilized by a general dental practitioner, immediately after perforation.

The aim was to analyze and compare different modalities in treating oroantral communication (OAC), that can be utilized by a general dental clinician immediately after perforation. Diagnostic and preventive measures were also methodically examined.

**Materials and methods.** Articles conducted from 2010 until 2018 on topics: Buccal flap, palatal flap, polyurethane foam, and PRF- platelet rich fibrin were analyzed in order to determine what gave the best prognosis. Short and long term complications that may arise by implementing the different techniques respectively were also carefully analyzed.

**Results.** The most frequent cause for OAC are due to extraction of the upper first molar. The average size of the perforation is hard to determine, but it is commonly agreed upon that perforation less than 5mm have the capability to heal on its own, and perforation larger than 5mm needing surgical intervention. All treatment modalities showed good results in closing of OAC, although the PRF- platelet rich fibrin was the only treatment that showed a remarkable 100% success rate in 2 separate studies which both included 21 patients. Despite new techniques showing promising results, the flap surgeries are still widely used, and are considered to be the "golden standard", for closure of OAC.

**Conclusion.** OAC are relatively rare, by implementing good preventive and diagnostic routines it is possible to avoid a lot of complications. Treatment should be carefully assessed and evaluated based on the clinician's skills, and patient's needs.

## VALIDATION OF THE LATVIAN VERSION OF THE NASAL OBSTRUCTION SYMPTOM EVALUATION (NOSE) SCALE

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**Keywords.** NOSE, Validations, Latvian-NOSE.

**Objectives.** The nasal obstruction symptom evaluation (NOSE) scale is a validated disease-specific, self-completed questionnaire for the assessment of quality of life related to nasal obstruction. The aim of this study was to validate the Latvian (latvian-NOSE) questionnaire.

**Materials and methods.** NOSE questionnaire was translated into latvian and than translated back in english. A prospective study was conducted on adult patients with nasal obstruction due to septal deviation. Patients undergoing functional septorhinoplasty were asked to complete the latvian-NOSE preoperatively and one month after the surgery. Healthy volunteers served as controls. Reliability and responsiveness of the latvian-NOSE were determined.

**Results.** In total 78 subjects were enrolled. Excellent internal consistency of the translated NOSE score was proven by Cronbach's  $\alpha = 0.922$ . Mann-Whitney-U test showed excellent between-group discrimination ( $p = 0.001$ ). The difference between preoperative and control groups was statistically significant ( $p = 0.001$ ). The difference between postoperative and control groups was not statistically significant ( $p = 0.05$ ), showing that operation was life quality improving.

The responsiveness was measured by comparison of the preoperative and postoperative NOSE sum-scores using Wilcoxon-rank test ( $p = 0.001$ ). Preoperatively the patients had a median NOSE score of 60 (range 5 - 90). One month after surgery the NOSE score was diminished to a median score of 10 (0 - 40) ( $p = 0.001$ ). Median NOSE score in control group was 0 (range from 0 to 20). These results indicate a high sensitivity of the adapted NOSE questionnaire to identify clinical changes due to an intervention. The average time of completion was 51 second.

**Conclusion.** Postoperative scores were significantly lower than preoperative scores, indicating good responsiveness. The latvian-NOSE scale is a valid, quickly completable instrument with good internal consistency and responsiveness. It is recommended to use the NOSE scale as an instrument for measuring subjective severity of nasal obstruction in latvian adult patients.

## THE IMPACT OF ELECTRONIC CIGARETTES ON SALIVATION AND DMF INDEX

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**Keywords.** E-cigarettes, vaping, salivation, DMF index.

**Objectives.** Many current e-cigarette users report dryness in the mouth and reduced amount of plaque after vaping. However, it is unclear whether these changes are perceived only on subjective level or there are indeed mechanisms that affect salivation and plaque scores.

The aim was to analyze how vaping or use of e-cigarettes affects salivary secretion and caries prevalence by comparing different parameters of salivation and DMF index between e-cigarette users (vapers), non-smokers and smokers of tobacco cigarettes.

**Materials and methods.** Three groups consisting of vapers, non-smokers and tobacco cigarette smokers (20 people each group) were enrolled. Besides measuring a time interval for appearance of the first drops of unstimulated saliva on the lower lip surface, secretion rates of stimulated and unstimulated saliva were calculated and viscosity of saliva was registered. DMFT (decayed, missing, filled teeth) and DMFS (decayed, missing, filled surfaces) indices were calculated. The results were described statistically and evaluated using SPSS 22 program and a nonparametric Mann-Whitney U test with the 5% level of significance.

**Results.** Mean time intervals for appearance of first drops of unstimulated saliva for vapers, non-smokers and tobacco smokers are 39.05s, 33.53s, 37.45s, respectively; mean stimulated saliva secretion rates - 1.67ml/min, 1.65ml/min, 1.90ml/min; mean unstimulated saliva secretion rates - 0.498ml/min, 0.477ml/min, 0.504ml/min; mean DMFT index - 9.15, 11.00, 8.45; and mean DMFS index - 17.70, 21.40, 15.30. All obtained results are without a statistical difference between the groups ( $p > 0,05$ ). There is a statistical difference between viscosity of saliva between non-smokers and vapers ( $p = 0,003$ ) - vapers more often present with thick saliva, whereas non-smokers have predominantly watery saliva.

**Conclusion.** There is no statistical difference between salivary flow rates and DMF indices between e-cigarette users, non-smokers and tobacco smokers. However, vapers present with thicker saliva when compared to non-smokers which can act as caries promoting factor.

## COMPARISON OF TEAR OSMOLARITY AFTER BANDAGE CONTACT LENS REPLACEMENT

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**Keywords.** Tear osmolarity; Bandage contact lens; Penetrating keratoplasty.

**Objectives.** Patients undergoing Penetrating keratoplasty use a therapeutic contact lens for one year, which is changed every month. In our study we measured tear osmolarity changes after contact lens replacement. Tear osmolarity is an important biomarker of ocular surface health. The aim was to determine whether the replacement of the new contact lens reduces the tear osmolarity. And to determine if patients using therapeutic contact lens are at risk of higher tear osmolarity.

**Materials and methods.** Study group was patients who came for a monthly visit to change their therapeutic contact lens. We used TearLab Osmolarity System and 6 Test Cards for each patient. Both eyes were measured 3 times: before contact lens removal, without contact lens and 10 minutes after replacement. Abnormal Osmolarity is defined by: An elevated reading, >300 mOsm/L or, when the inter-eye difference is >8 mOsm/L. The results were analyzed with Microsoft Excel and IBM SPSS Statistics.

**Results.** In total, 19 patients were examined. The mean patient age was 68 years.

In eyes with corneal graft mean Tear osmolarity in 3 measurements were 287,9, mOsm/L, 301,6 mOsm/L and 285,8 mOsm/L. The mean difference after contact lens replacement in eye was 2,1 mOsm/L, using Related-Samples Wilcoxon Signed Rank Test (RSWSRT) no significant differences was found (P = 0,740). In the healthy eye Tear osmolarity in 3 measurements were: 295,2 mOsm/L, 300,4 mOsm/L and 299,5 mOsm/L. The mean difference after contact lens replacement in eye was 4,3 mOsm/L, using (RSWSRT) no significant differences was found (P = 0,071) Significant differences was found between both eyes after contact lens replacement mean 13,6 mOsm/L (P = 0.002)

**Conclusion.** Study confirms that replacement of the new contact lens reduces the tear osmolarity. Also study shows that Bandage contact lens reduces tear osmolarity when we compare it with "healthy eye".

## ASSOCIATION BETWEEN RETINAL THICKNESS AND VISUAL ACUITY IN RETINAL VEIN OCCLUSION IN PATIENTS TREATED WITH LASER GRID PHOTOCOAGULATION AND ANTI-VEGF AGENT INJECTIONS

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**Keywords.** Retinal vein occlusion; Anti-VEGF; Intravitreal injections.

**Objectives.** Retinal vein occlusion(RVO) is a common vascular disorder of the retina. Macular edema(ME) leads to vision loss in many patients with RVO.The use of anti-VEGF agents and grid laser photocoagulation has been used as a mainstay treatment for ME following RVO.

The aim of this study was to examine the effects of anti-VEGF agent injections and grid laser photocoagulation in the treatment of ME and BCVA deterioration following RVO.

**Materials and methods.** A retrospective study was done in Pauls Stradins Clinical University Hospital.Heidelberg Spectralis Optical Coherence Tomography(OCT) was used for retinal thickness measurements.The retinal thickness and best corrected visual acuity (BCVA) was measured after each anti-VEGF agent injection.Obtained data were analyzed using IBM SPSS Statistics Version 23.0 and Microsoft Excel 2016.

**Results.** 29 eyes were examined, out whom 15 eyes were after grid laser photocoagulation.A total of 98 results after anti-VEGF injections were analyzed.The mean patient age during the treatment was 70 years  $\pm$  13.On average patient received 3.6 anti-VEGF injections.The mean BCVA after the first injection was 0.18  $\pm$  0.15 by Snellen chart and the mean ME thickness was 460 $\mu$ m  $\pm$  184.The mean BCVA,measured after the last injection was 0.23  $\pm$  0.19 by Snellen chart and the mean retinal thickness was 302 $\mu$ m  $\pm$  105.Out of 29 patients,69%(n = 20) had improved BCVA and decreased ME.The patients who had undergone grid laser photocoagulation did not show statistically significant BCVA improvement(p = 0.227) neither statistically significant ME decrement (p = 0.517) when compared with anti-VEGF injection alone.The ME reduction after last anti-VEGF injection was statistically significant from 460 $\mu$ m to 302 $\mu$ m,p = 0.002.The BCVA after last anti-VEGF injection was not statistically significant from 0.18 to 0.23 by Snellen chart,p = 0.352.

**Conclusion.** There was statistically significant retinal thickness reduction in patients treated with anti-VEGF agents. Despite the therapy of intravitreal anti-VEGF,visual acuity improvement was not statistically significant We found no statistically significant correlation between patients treated with grid laser photocoagulation and intravitreal anti-VEGF therapy alone.

## TEAR OSMOLARITY CHANGES IN PATIENTS AFTER CATARACT SURGERY

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**Keywords.** Cataract; Tear osmolality; Tear brake up time.

**Objectives.** Tear osmolality (TO) is an important factor in dry eye syndrome development which can occur after cataract surgery, therefore can greatly affect patient quality of life. For all patients who under go cataract surgery, an eye drops with steroids and antibiotics are prescribed to prevent infection.

The aim of our study was to analyze TO changes in patients before and after cataract surgery according to tear brake up time result (TBUT), where > 8sec was considered as normal but < 8sec abnormal. Normal tear osmolality was considered < 300mOsm/l.

**Materials and methods.** Patients were examined before cataract surgery and 10 days after surgery using TearLAB Osmolarity System on the operated eye. TBUT was evaluated using slit lamp and a hronometre. Patients were divided in two groups according to TBUT results (in the first group TBUT was < 8 sec but in the second group > 8sec). Data was analyzed using Microsoft Exel and IMB SPSS 22.0.

**Results.** 16 patients were examined. Average age was 68,93. Mean TO before surgery in first group was  $295,25 \pm 9,92\text{mOsm/l}$ , in second group -  $299,88 \pm 12,81\text{mOsm/l}$ . Mean TO after surgery in first group was  $305,50 \pm 23,00\text{mOsm/l}$  but in second group -  $306,63 \pm 14,08\text{mOsm/l}$ . Mean difference of TO in first group was - minus  $10,25 \pm 20,96\text{mOsm/l}$  but in second - minus  $6,75 \pm 16,55\text{mOsm/l}$ . T test was used to compare these two groups -there was no statistically significant difference found between these 2 groups and TO before cataract surgery ( $p = 0,433$ ). There was also no statistically significant difference found between these two groups and the difference of TO ( $p = 0,717$ ).

**Conclusion.** TO increased in both groups after the cataract surgery. There was no relations found between these 2 groups and TO. Patients with  $\text{TO} > 300\text{mOsm/l}$  are more likely to have ocular discomfort postoperatively. Ophthalmologists should consider evaluating TO preoperatively, especially in risk groups.

## PATIENTS SUBJECTIVE COMPLAINTS AND ABILITY TO READ NEAR TEXTS IN CASE OF MONOVISION AFTER CATARACT SURGERY

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**Keywords.** Monovision; Cataract.

**Objectives.** Monovision is a condition to treat age related presbyopia. In monovision one eye is corrected for near, but the other one – for far vision. However, it is still discussed, whether monovision significantly improves patients ability to see and how does monovision cataract surgery affect patients ability to do everyday tasks without glasses.

The aim was to find out monovision patients general satisfaction with cataract surgery results, the main complaints after this surgery and whether it has significantly improved their capability doing everyday tasks without glasses.

**Materials and methods.** Study is carried out on 13 Pauls Stradiņš Clinical University hospital patients with monovision after cataract surgery. The difficulty to do 9 everyday tasks before and after cataract surgery without glasses was evaluated by point system 1 – 4, where 1 – great difficulty, 2 – moderate difficulty, 3 – little difficulty and 4 – no difficulty. Patients general satisfaction with surgery results was also analyzed using point system 1(unsatisfied) – 5(satisfied). Related Samples Wilcoxon Signed Rank test was used to determine whether monovision cataract surgery has significantly improved patients ability to do these 9 everyday tasks. Reliability value of  $p = 0,05$  was chosen. Data were analyzed using software SPSS statistics and Microsoft Excel.

**Results.** Monovision cataract surgery has significantly improved the ability to do 7 out of 9 evaluated everyday tasks without glasses for these patients. The main complaints for these people after cataract surgery were reading near texts with small letters and driving. Patients general satisfaction with surgery results is 95,38 %.

**Conclusion.** Monovision cataract surgery can significantly improve patients capability doing simple everyday tasks. Main complaints for these patients after cataract surgery are reading near texts with small letters and driving. Patients are satisfied with their surgery results. More studies may be done in this field with more patients taking part.

## THE EFFECT OF INTRAVITREAL BEVACIZUMAB INJECTIONS ON DIABETIC RETINOPATHY PATIENTS WITH AND WITHOUT IRIS NEOVASCULARISATION

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**Keywords.** Iris neovascularisation; Intravitreal Bevacizumab injections; Diabetic retinopathy.

**Objectives.** Intravitreal Bevacizumab injections are amply used method for treating diabetic maculopathy and diabetic retinopathy (DR). Iris neovascularisation (IN) is a finding indicating ischemia and poor diabetes compensation.

The aim of the study was to evaluate the differences in therapeutic effect of intravitreal injections of Bevacizumab in patients with DR comparing groups of patients with and without IN.

**Materials and methods.** The retrospective study was conducted including 26 patients undergoing intravitreal Bevacizumab injection therapy for treatment of DR in 2018 at Pauls Stradiņš Clinical University Hospital. Those patients were divided into 2 groups according to the findings of the eye anterior part biomicroscopy: patients who have IN (n = 13) – Case and patients who do not (n = 13) – Control. The efficiency was evaluated by changes in Early Treatment of Diabetic Retinopathy (ETDR) visual acuity chart, iCare intraocular pressure (IOP) tonometry and central macular thickness (CMT) on Optical Coherence Tomography. Data were analysed using IBM SPSS softwares T-test and Mann – Whitney test.

**Results.** 26 patients were analysed aged from 24 to 82 years. 7 injections were received by 1 patient (4%) 6 – 1 (4%), 5 – 3(12%), 4 – 5 (19%), 3 – 7(27%) and 2 – 9 (35%). There was no statistically significant difference in IOP changes (p = 0,960) or CMT changes (p = 0,223) before and after the therapy. But there was an important difference between the visual acuity (p = 0,061). The mean visual acuity change in Case group was -0,023(-0,19 to 0,2), but in Control group +0,075(-0,11 to +0,4).

**Conclusion.** Iris neovascularisation does not significantly change the outcome of DR treatment with intravitreal Bevacizumab injections. Even though no statistically significant difference was discovered, the changes in visual acuity should be researched further. For data to be more credible the research should be continued including more patients.

## CHANGES IN OCULAR BIOMETRICS AFTER EXPOSURE TO SHORT TERM MONOCULAR DEFOCUS

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**Keywords.** Defocus; axial length (AL); Anterior chamber depth (ACD); Lens thickness (LT).

**Objectives.** Coordination among refractive components of the eye – anterior chamber depth, lens thickness, and axial length, define the refractive state of the eye. Optical defocus is an important factor in regulation of these biometrics. Our purpose of this research is to investigate changes in AL, ACD and LT after exposure to short term monocular defocus: myopic (+3D), hypermetropic (-3D), diffuse.

The aim of this research was to investigate changes in AL, ACD and LT after exposure to short term monocular defocus: myopic (+3D), hypermetropic (-3D), diffuse.

**Materials and methods.** Twenty-five young adults evaluated in this study. Mean age  $25 \pm 3,4$  range 19-34 years, 16 women, 9 men. All participants had no history of ocular trauma or surgery. Everyone was tested with three different monocular defocus each on a different day: diffuse, myopic (+3D defocus), hypermetropic (-3D defocus). Before, after thirty minutes and after sixty minutes of defocus, everyone was tested with auto-refractometer and ZEISS IOLMaster optical biometry where we measured AL, ACD and LT

**Results.** Using paired-t test AL decreased by  $10.4 \mu\text{m} \pm 11\mu\text{m}$  (statistically significant) ACD decreased by  $1.2\mu\text{m} \pm 53\mu\text{m}$  (not statistically significant), LT increased by  $10.4\mu\text{m} \pm 59\mu\text{m}$  (not statistically significant) after myopic defocus (+3D). After hypermetropic (-3D) defocus AL decreased by  $1.6 \mu\text{m} \pm 15\mu\text{m}$  (not statistically significant) ACD increased by  $6.8\mu\text{m} \pm 50\mu\text{m}$  (not statistically significant), LT increased by  $23\mu\text{m} \pm 88\mu\text{m}$  (not statistically significant). After diffuse defocus AL decreased by  $2.4 \mu\text{m} \pm 12\mu\text{m}$  (not statistically significant) ACD increased by  $5.2\mu\text{m} \pm 50\mu\text{m}$  ( $p > 0,05$ ), LT increased by  $36\mu\text{m} \pm 13\mu\text{m}$  (not statistically significant).

**Conclusion.** We have found statistically significant axial length changes using myopic defocus (+3D). Decreased axial length tends to partly compensate induced defocus. We observed that anatomical structures of the eye can be influenced by solely optical manipulations and that shows significant role of using appropriate optical correction method on daily basis.

## MEIBOMIAN GLAND CHANGES AFTER INTRAVITREAL INJECTIONS

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**Keywords.** Meibomian glands; Tear osmolarity; Intravitreal injections.

**Objectives.** Meibomian gland dysfunction is caused by blockage or other abnormality of the glands. As a result of the damage Meibomian glands do not secrete enough oil in the tears, respectively tears evaporate too quickly. All this process can lead to dry eye. The aim of this study was to evaluate and compare the functions of Meibomian glands after intravitreal injections by conducting a prospective clinical study

**Materials and methods.** A prospective study was done in Pauls Stradins Clinical University Hospital. 40 eyes were included. The evaluation of Meibomian gland functions was estimated using count of Meibomian glands on temporal and nasal parts of lower eyelid, Oxford scale score, TBUT, and Meibomian gland secret appearance analyses. The tear osmolarity changes were measured by TearLab osmolarity test. Obtained data were analyzed using IBM SPSS Statistics Version 23.0 and Microsoft Excel 2016.

**Results.** Eighteen eyes (45%) were right eyes and 22(55%) were left eyes. The male-female ratio was 1:3,3. The patient age on average was  $75.48 \pm 13.92$ . The median Oxford scale score was  $1.3 \text{ points} \pm 0.96$ . On the nasal part of the lower eyelids, median Meibomian gland count was  $5.93 \pm 2.06$  glands and on temporal part of lower eyelids median Meibomian gland count was  $6.18 \pm 2.33$  glands. Thirty-five eyes (87.5%) showed decreased TBUT ( $< 10$ s). The median TBUT was  $6.94 \text{ s} \pm 2.47$ . Thirteen eyes ( $n = 32.5$ ) did not have secret dropout of Meibomian glands. The median tear osmolarity before intravitreal injection was  $293.75 \text{ mOsm/l} \pm 2.38$ . The median tear osmolarity after intravitreal injection was  $289.482 \text{ mOsm/l} \pm 4.29$ . There was no statistical significance between tear osmolarity before intravitreal injection and after intravitreal injection ( $Z = -1,728, p = 0,084$ ) (Wilcoxon Signed Rank Test).

**Conclusion.** The majority of examined eyes showed decreased TBUT. One-third of eyes also showed lack of Meibomian secret, which means that these patients are on higher risk to develop dry eye disease. There was no statistical significance when osmolarity before intravitreal injection and after intravitreal injection was compared.

## INSTRUMENTAL DIAGNOSTIC IN GLAUCOMA DISEASE

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**Objectives.** There is known that glaucoma can lead to the loss of a vision. However early stage glaucoma usually does not cause any symptoms so right early diagnosis and treatment is very important. Ophthalmoscopy, optic nerve imaging and perimetry have been traditionally used in glaucoma diagnosis, but these techniques may be insufficient in early diagnosis of the disease. The aim of this study was to find correlation between macula changes and visual field losts in early glaucoma stage.

**Materials and methods.** Retrospective analysis were made. Visual field parameters were evaluated using standart automated perimetry (MD, PSD indicators). Macular changes were measured with optical coherence tomography. Patient's eyes were divided into 2 groups according to the average macular thickness (AMT) and visual field parameters (MD, PSD) were compared. Statistical analysis of data was performed using SPSS and MS Excel software. The results were statistically significant at p value less than 0.05.

**Results.** A total number of 63 early glaucoma affected eyes (patients mean age:  $59 \pm 5$  years) were examined. Average macular thickness, central subfield thickness correlated statistically significant with all the measures in a visual field (MD-SAP, PSD-SAP), with P-value less than 0,001. Mean deviation (MD) scores were found higher in the eyes with a thin AMT comparing to the results with an intermediate AMT, the significant correlation was found, with P value less than 0,001.

**Conclusions.** Our study shows a relationship between structure and function in patients with early glaucoma using SD-OCT determined macular thickness and visual field parameters that may help specialists use AMT meas-urements for early glaucoma diagnosis.

## ANAESTHESIOLOGY, REALOGY, EMERGENCY MEDICINE

### USAGE OF NON-INVASIVE CARDIOVASCULAR MONITORING SYSTEM DURING SPINE STABILITAZION SURGERY

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**Keywords.** General anaesthesia, cardiovascular system monitoring.

**Objectives.** Non- invasive cardiovascular (Non-inv CV) monitoring system might be an alternative tool for CV system assessment in high risk surgery patients. Non-inv CV monitoring has not been widely applied during surgery under general anaesthesia. The aim was to analyse changes of non- invasive cardiovascular (Non-inv CV) measurements during general anaesthesia in spinal stabilization surgeries.

**Materials and methods.** In prospective study 10 elective patients were analysed in 2018. Two underwent Anterior lumbar interbody fusion (ALIF) approach combined with posterior transpedicular fixation (TPF) while 8 - only TPF due to spondylarthrosis of lumbar part with spinal stenosis, spondylolisthesis and vertebral fractures. All patients had standardized general anaesthesia. N-inv CV parameters with NICaS® system were measured: stroke volume (SV), stroke index (SI), cardiac perfusion index (CPI), cardiac output (CO), cardiac index (CI), total peripheral resistance and index (TPR, TPRI), total body water index% (TBW) in parallel with MAP and CVP in several periods: after induction (T1), after 30 min (T2), after 60 min (T3), in the middle of surgery (T4), et the end of surgery (T5), after extubation (T6). As a primary outcome correlation between non-inv CV parameters and changes of MAP and CVP were analysed. Secondary association between fluid balance after surgery and non-inv CV was observed. Significance  $p < 0.05$ .

**Results.** Totally, 10 patients with average age  $62 \pm 5$  years, mean BMI  $29.7 \text{ kg/m}^2$  with an average operation time  $340 \pm 55$  min were analysed. Significant correlation was detected between MAP and TPR at T1,  $r = 0.7$ ;  $p = 0.03$  and at T6,  $r = 0.8$ ;  $p = 0.007$  as well as between MAP and CPI at T3,  $r = 0.7$ ;  $p = 0.02$ . Additionally, the maintenance dose of fentanyl at T4 showed significant association with SI,  $r = 0.6$ ;  $p = 0.049$ . No correlation was found between CVP and non-inv CV measurements. Although, we could not find association between TBW and fluid balance at the T6, those with positive balance presented higher CO values at T6  $7.8 \pm 3$  vs  $4 \pm 1.3$ ,  $p = 0.047$ , without difference in MAP and CVP values.

**Conclusion.** Non-inv CV parameters reflects changes of vascular resistance according to depth of anaesthesia without demonstrating volume status of patients under general anaesthesia.

## THE MOST COMMON CAUSE OF NAUSEA AND VOMITING DURING CAESAREAN DELIVERY UNDER REGIONAL ANAESTHESIA AND ITS PRIOR PROPHYLAXIS

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**Keywords.** Regional anaesthesia, Caesarean delivery, intraoperative nausea, vomiting.

**Objectives.** Intraoperative nausea and vomiting (IONV) are common during the regional anaesthesia (RA) for caesarean delivery (CD). The knowledge of etiology helps to investigate prophylactic approach for IONV prevention before CD. The aim was to discover the most common causes of IONV during the CD under RA and to examine the efficiency of preoperative intravenous fluid therapy.

**Materials and methods.** The prospective study was conducted in PSCUH. Patients were randomly selected and divided into two groups (G): G1 – the control group with 202 patients, where only the cause of IONV during acute and elective CD was assessed, and G2, a group of 51 patients who had preoperative co-loading of fluids. Data has been statistically analysed in SPSS (IBM SPSS 21). Significance "p < 0.05".

**Results.** Overall, 253 patients' data were analysed. In G1 was discovered that IONV occurred in 61.9% patients after hypotension, in 12.7% after antibiotic treatment, in 9.5% after removing the placenta, 8.7% after delivery and in 7.1% during suturing. In G1 there were 126 patients, who experienced IONV, in comparison to 19 patients from G2. "p < 0.001". Furthermore, 64 G1 patients with hypotension experienced IONV, in comparison to 11 patients from the group G2. "p < 0.001". In elective CD there is a significant correlation between IONV and the time of operation: at 8a.m.-10a.m., 11a.m.-2p.m. and 3p.m.-6p.m. the IONV occurred in 31 out of 58(53.4%), 48 out of 54(88.9%) and 7 out of 7(100%) patients respectively. There was no correlation between the two RA approaches (spinal and epidural) and IONV.

**Conclusion.** The most common cause of IONV during CD under RA is hypotension. Preoperative fluid co-loading for CD under RA shows less cases of IONV. In elective CD there is significant correlation between IONV and the time of operation.

## ACUTE BACTERIAL MENINGITIS IN PATIENTS ADMITTED TO THE INTENSIVE CARE UNIT: PRESENTATION AND MANAGEMENT AS PROGNOSTIC FACTORS.

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**Keywords.** Bacterial meningitis, intensive care unit, adult, outcome.

**Objectives.** The majority of cases of bacterial meningitis occur in adults. In spite of advances in antibiotics, mortality rate is still high. These studies indicate that acute bacterial meningitis is still a serious disease and may require specific management in Intensive care unit (ICU). The present study aims at analyzing the clinical features and management during ICU stay and prognostic factors, related to an adverse clinical outcome. The aim was to evaluate how the clinical features, management and prognostic factors of patients associated with acute bacterial meningitis (ABM) admitted to the ICU affects the clinical outcome.

**Materials and methods.** There were 83 episodes with ABM admitted to the ICU. 1 patient was excluded due to treatment in another hospital.

Clinical features, vital signs at the admission time, CSF characteristics, start of antibiotic and steroid therapy, venous blood and arterial blood gas tests, number of days spent at hospital and at ICU were recorded. Mental status was assessed using Glasgow Coma Scale. (GCS) The severity of the disease within 24 hours of admission to the ICU were detected by Acute Physiology and Chronic Health Evaluation (APACHE II) scale. To determine the extent of an organ function or rate of failure, the sequential organ failure assessment score (SOFA) were used.

**Results.** Death and severe neurologic deficit affected 29.2% of the series under study. (n = 24) As expected, *Streptococcus pneumoniae* was the most common causative agent of ABM (34.1%) 75 patients received initial therapy with third generation cephalosporin, ceftriaxon being the most commonly indicated. 45 patients received adjunctive therapy with dexamethasone. In 37 patients, who do not received therapy with corticosteroids, 11 had a fatal course of disease. The median stay in the ICU and hospital was 8.3 / 25.5 days respectively.

**Conclusion.** APACHE II score was the only independent factor associated with an adverse clinical outcome. The baseline values associated with death were complications : sepsis and multiple organ dysfunction syndrome. The current findings suggest that use of dexamethasone can reduce duration of staying in ICU, but does not correlate with mortality rate.

## REGIONAL VARIABILITY OF INCIDENCE AND MORTALITY OF PEDIATRIC CRITICAL ILLNESS IN LATVIA

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**Keywords.** Paediatric intensive care, mortality, standardized mortality ratio, regional variability.

**Objectives.** There is only one paediatric intensive care unit (PICU) in Latvia, where all critically ill children < 18 years are admitted from all regions of Latvia. The aim of this study is to ascertain regional differences in mortality and morbidity of critically ill children over a 5-year period.

**Materials and methods.** Descriptive retrospective study of children who were admitted to the PICU in Latvia from January, 2012 to December, 2016. Data on episodes were obtained from the Children's Clinical University Hospital electronic health records. Paediatric Index of Mortality (PIM2) was used for risk adjustment and calculation of standardized mortality ratio (SMR). The data were compared among the six regions of Latvia – Kurzeme, Latgale, Pierīga, Rīga, Vidzeme, and Zemgale.

**Results.** The analysis included 3651 intensive care episodes.

The highest PICU admission prevalence was in Rīga and the lowest in Latgale – 2.3 and 1.7 admissions per 1000 children per year, respectively. The highest emergency admission proportion was observed in Rīga and Pierīga, while the lowest in Latgale – 52 and 38 %, respectively. The average proportion of mechanically ventilated patients ranged from 24 to 29 % of all admitted patients across the regions. SMR for the total population was 1.44 (95 % CI: 1.17–1.81). In two regions, Rīga (1.51; 95 % CI: 1.04–2.14) and Latgale (2.21; 95 % CI: 1.9–3.76), it was significantly higher than 1.

**Conclusion.** We noted excess mortality (SMR >1) in the population of critically ill children in Latvia, 2012–2016; in particular, in patients from two regions – Rīga and Latgale.

## ARE ANAESTHESIOLOGISTS OF BALTIC COUNTRIES AWARE OF COMMONLY DISCUSSED ANAESTHESIA COMPLICATIONS' RATES?

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**Keywords.** anaesthesia, patient, safety, knowledge, complications, rates, incidence.

**Objectives.** The practice of anaesthesia is becoming increasingly challenging due to rising standards of care, complex surgical procedures, multiple chronic comorbidities and ageing patient population. As legal regulation of patient's safety is strictly defined in most of the countries it is important for the patient to give an informed consent before the procedure. Expertise in anaesthesia, knowledge about possible side effects, complications and their incidence are crucial for anaesthesiologist to be able to deliver information, necessary for the patient to consent for the procedure. The aim of this research was to determine the understanding and knowledge about anaesthesia complications' rates amongst the anaesthesiologists of the Baltic countries.

**Materials and methods.** Anonymous and freewill questionnaires were responded by anaesthesiologists of Lithuania, Latvia and Estonia. Participants had to enrol exact numbers of rates of given complications (dental damage, anaphylaxis, unintentional awareness, death) or mark if they were unsure. Moreover, they had to designate the consent form used in their daily practice. Statistical analysis was performed using SPSS v.18.0.

**Results.** There were 223 respondents in the survey. 68% of the participants were able to determine average incidence of the dental damage during general anaesthesia out of which 21% indicated the correct numbers. As for average death risk 66% thought to be sure about their answer. However, only 5% of them referred the frequencies that were accurate. The difference between answers of doctors of different countries was statistically unreliable.

**Conclusion.** There is a substantial variation in understanding of anaesthesia risks among anaesthesiologists. Appropriate actions should be taken to increase anaesthesia consent awareness and quality of informed consent for anaesthesia process in Baltic countries.

## EPIDEMIOLOGICAL ANALYSIS OF BURN PATIENTS IN PAEDIATRIC INTENSIVE CARE UNIT

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**Keywords.** Pediatric burn injury, epidemiology.

**Objectives.** Burns comprise various types of injuries and require not only immediate management of pain and tissue damage but can also lead to lifelong disability or functional, psychological and aesthetic problems for children. The aim of this study was to analyse epidemiological distribution of pediatric burn patients requiring intensive care.

**Materials and methods.** A retrospective descriptive study was done in pediatric intensive care unit (PICU) of Children's Clinical University Hospital where the most severe cases of pediatric burn injuries are managed. All children admitted less than 24 hours after the event were included during the years 2012–2018. Clinical data was collected from electronic medical records (IntelliVue Clinical Information Portfolio; Phillips). Epidemiological data was gathered from Central Statistical Bureau of Latvia (CSBL). Regional and gender analysis was done for the age group 0-14 years due to different age grouping in CSBL.

**Results.** A total of 218 patients were included in the study; 138 (63.3%) were male, 80 (36.7%) were female. The median age was 1.4 (IQR = 1.1-2.6) years, 83.9% were less than 7 years old. In the age group 0-14 years proportion of male burn victims was 62.3% and it was significantly higher than male proportion in population – 51.4% ( $p = 0.0014$ ). Mean incidence of severe burn injuries in Latvia treated in PICU was  $10.16 \pm 1.37$  per 100'000 children but in those coming from Pierīga region –  $6.08 \pm 2.47$  per 100'000 children.

**Conclusion.** Children in an especially vulnerable age (< 3 years) comprised almost four fifths of all burn victims. No statistically significant difference was found between the mean incidence in Latvia and the different regions except for Pierīga region where it was found to be lower. Being a male was an independent risk factor for burn injuries.

## INCIDENCE OF POSTDURAL PUNCTURE HEADACHE AND PATIENT'S AWARENESS OF POSSIBLE COMPLICATION IN PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Anaesthesiology, epidural anaesthesia, post-dural-puncture headache, possible complications.

**Objectives.** Postdural puncture headache is one of the most common complication in the postpartum Related to epidural anaesthesia. The goal is to find out the incidence of headache after dural puncture and awareness of possible complications in parturients at Pauls Stradins Clinical University Hospital.

**Materials and methods.** Prospective study, interviewing patients seven days after childbirth, who have had epidural anesthesia during labor in P.Stradins CUH in the period from October 01, 2018 to January 01, 2019

**Results.** In the period from October 01, 2018 to January 01, 2019 one hundred patients were interviewed and observed. The headache occurred in 15 (15%) patients, of which 12 (80%) patients described it as mild and other 3 (20%) – as moderate. In 5 (33%) patients headache occurred 48 hours after puncture, 5 (33%) – after 72 hours, in 4 (27%) patients – after 96 hours and in one (7%) patient – after 120 hours. The duration of a headache was 12 hours in 2 (13%) patients, 24 hours in 7 (47%) patients, 48 hours in 5 (33%) patients and 72 hours in 1 (7%) patient. The average time of hospital stay was 3.47 +/- 0.83 days (median 3 days). An out-of-hospital headache occurred in 10 (67%) patients, 40% of them did not know correct treatment and care. Only 33 (33%) from all cases have received information about possible complications. All patients admitted that they would like to be informed. Thirty-four (34%) patients noted that they would like to receive information prior the labor, 56 (56%) – on the day of hospitalization, and 10 (10%) patients – just before the manipulation.

**Conclusion.** Postdural puncture headache is a frequent complication with an incidence of 15% of cases. All patients noted the lack of information about complications in case of an epidural puncture.

## THE EFFECT OF BLOOD COMPONENT TRANSFUSIONS DURING CARDIAC SURGERY ON CLINICAL OUTCOMES

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**Keywords.** Blood component transfusions, cardiac surgery, LVEF.

**Objectives.** Intraoperative anaemia, other point blood component transfusions can contribute negatively to patient's morbidity and mortality in cardiac surgery. Left ventricular ejection fraction (LVEF) < 40% is a risk factor for prolonged stay in ICU. This prospective single-centre randomized cohort review aimed to investigate the relationship between intraoperative blood component transfusions and clinical outcomes in two patient groups (preoperative LVEF I < 40% and II ≥ 40%).

**Materials and methods.** Data from 100 adult patients who underwent elective cardiac surgery with cardiopulmonary bypass in Paul Stradiņš Clinical University Hospital at the department of cardiac surgery, anaesthesiology and intensive care in 2017 was obtained and analysed using SPSS Statistics.

**Results.** In the I group (n = 49), platelet, fresh frozen plasma, cryoprecipitate and red blood cell transfusion were less frequently performed, as compared to the II group (n = 51), 4.08% and 9.8% (p = 0,009), 32.65% and 39.22%, 28.57% and 39.22%, 26.53% and 27.45%, respectively but were more likely to have positive fluid balance (81.63% as compared to 78.43% in LVEF ≥ 40% group). The mortality rate was lower in the LVEF < 40% group (0% as compared to 11.76% in the LVEF ≥ 40% group) (p = 0,013). There was no significant differences between groups in the median ICU stay and hospital time (1 and 9 days, to 2 and 10 days). Prevalence of diabetes was lower in the I group (14.29% as compared to 23.53% in the II group) (p = 0,08).

**Conclusion.** According to this study, blood component transfusions were used more in patient group with preoperative LVEF ≥ 40%. In this group transfusions are associated with higher mortality rate and longer length of stay in hospital. Other factors such as prevalence of diabetes may have impacted the outcomes.

## EFFECT OF ENVIROMENTAL DISTRACTORS ON PERSISTENCE OF ANAESTHETISTS'ATTENTION IN OPERATING ROOM

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**Keywords.** Patient care, patient safety, distractors, anaesthetists.

**Objectives.** One of the ways to provide high quality of patient care is to maintain focus all operation time. Although anaesthetists are trying to avoid distractors and interruption in operating theatre, there are many factors which threaten patient safety and health. The aim was to describe common distractor frequency, types and reasons in anaesthetist's practice, find associations between distractors frequency and nature and compare distractions frequency and type between regional and general anaesthesia.

**Materials and methods.** Approval for the research was acquired from the ethics committees - Riga Stradins university Research ethic committee. Data were collected for 5 months from real time observations. A total of 11 general and 9 regional anaesthetics were observed. Each anaesthetic was observed from time of patient arrival to theatres until discharge to the ward. Distractors were evaluated using Healey scale. Recorded variables included initiator, impact of distracting events, urgency of event. Data were summarized by counts (percentages) and compared using Fisher exact test.

**Results.** Twenty cases were observed for a total of 37 h with 352 distracting events. Median case duration was 122,6 min. Common initiator of distractions was anaesthetist - 38%, surgeon - 19% and circulating nurse - 19%. Most distractions (59%) were minor. Distractions occurred more with regional anaesthesia ( $p = 0.02$ ). During general anaesthesia more urgent events were causing distractions ( $p = 0.018$ ).

**Conclusion.** Distractions in operating room are common but minor. They accord more during regional anaesthesia and anaesthetists are frequently the initiators.

## THE ROLE OF DEXAMETHASONE ADMINISTRATION IN INTERSCALENIC PERIPHERAL NERVE BLOCK

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**Keywords.** Dexamethasone, interscalenic block, shoulder surgery.

**Objectives.** Dexamethasone added to local anaesthetics or delivered systemic prolongs the duration of interscalene block. The optimal route of administration is still controversial. The aim was to evaluate the role of Dexamethasone administration on interscalenic peripheral nerve block in shoulder surgery patients.

**Materials and methods.** The retrospective study was carried out including 182 patients undergoing shoulder elective surgery in 2018. Seven patients were excluded due to inadequate interscalene block. 175 patients were divided into 3 groups: patients who did not receive dexamethasone (D0, n = 77), patients who receive dexamethasone intravenously (IVD, n = 50) or perineural (PD, n = 48). Regardless of Dexamethasone administration, Ropivacaine 0.75% - 20 ml or Bupivacaine 0.25% - 20 ml were used as local anaesthetics. Postoperative pain was assessed with Visual Analog Scale (VAS) and depending on whether it was used opioid as rescue medication for sudden pain relief.

**Results.** 175 patients were analysed with mean age  $46 \pm 14$ . Patients had arthroscopic rotator cuff repair (42%, n = 73+), arthroscopic stabilisation (6%, n = 11), open stabilisation (11%, n = 20), arthroscopic biceps tenodesis (10%, n = 18), arthroscopic acromioclavicular joint excision (17%, n = 29) or other shoulder surgery (14%, n = 24) under general anaesthesia combined with interscalene block. 49% (n = 85) of them observed sudden pain with mean time 588 minutes after surgery and they receive Sol. Promedoli 2% - 1 ml as rescue medication. We analyzed data using Chi-square test. Appearance of sudden pain postoperative was detected less often in IVD group compared to D0 group (p = 0.04) and PD group compared to D0 (p = 0.001), but there was no important difference IVD group compared to PD group (p = 0.05).

**Conclusion.** Dexamethasone significantly prolongs duration of analgesia, decreases frequency of sudden pain development and usage of opioid rescue medication used both intravenous or perineural routs.

## BIOIMPEDANCE ANALYSIS FOR CRITICALLY ILL PATIENTS IN ICU

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**Keywords.** ICU, bioimpedance, fluid balance, inflammation, critical care.

**Objectives.** According to the literature the positive fluid balance is associated to higher mortality of critically ill patients. However it is quite difficult to measure fluid accumulation precisely in ICU. Bioimpedance analysis allow us to measure the ICW, ECW, TBW. The aim was to find the correlation between inflammatory response and fluid accumulation in critically ill patients using bioimpedance analysis.

**Materials and methods.** Prospective study with 42 critically ill patients who were mechanically ventilated more than 24h was made. Patients were divided into two groups: with metabolic acidosis (BE less or equal 3 mmol/L and without (more than 3 mmol/l).

**Results.** We enrolled 42 patients (mean age  $59 \pm 15$  years) and analysed 211 BIA measurements. There was a positive significant weak correlation between C-reactive protein and ICW ( $r = 0.174$ ,  $p$  value less 0.012), ECW ( $r = 0.167$ ,  $p$  less 0.015) and TBW ( $r = 0.172$ ,  $p$  less 0.012). It shows that patients with more severe inflammation have more pronounced capillary leak syndrome and fluid accumulation. Those patients who accumulate more fluids have lower pH and severe base deficit: negative significant weak correlation was found between ICW, ECW, TBW and pH ( $r = -0.338$   $p$  less 0.001,  $r = -0.411$ ,  $p$  less 0.001  $r = -0.378$   $p$  less 0.001, respectively) and BE ( $r = -0.266$   $p$  less 0.001,  $r = -0.344$   $p$  less 0.001,  $r = -0.317$   $p$  less 0.001, respectively). Patients with acidosis (69 patients) compared with patients without (124 patients) had significantly higher fluid accumulation (ICW  $28.1 \pm 6.1$  vs  $25.7 \pm 4.8$   $p = 0.003$ , ECW  $19.5 \pm 4.2$  vs  $17.4 \pm 2.9$   $p$  less 0.001, TBW  $47.7 \pm 10.2$  vs  $43.1 \pm 7.2$   $p$  less 0.001).

**Conclusion.** The inflammation expressed by CRP have more pronounced capillary leak syndrome and fluid accumulation. Those patients who accumulate more fluids have lower pH and higher base deficit due to impaired oxygen delivery to the cell: worse microcirculation and larger distance between the capillary and a cell.

## POSTOPERATIVE PAIN MANAGEMENT AFTER QUADRATUS LUMBORUM BLOCK AT RIGA EAST UNIVERSITY HOSPITAL

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**Keywords.** Analgesia; pain management; quadratus lumborum block.

**Objectives.** In recent years, ultrasound introduction in the anaesthesia is rapidly become popular. It provides safety and efficacy to regional anaesthesia for the treatment of postoperative pain. Quadratus Lumborum block (QLB) was first described by Blanco in 2007 as a variant of the Transversus Abdominis Plane block (TAP), after 6 years of working he gave a precise technique of the QLB. It is a posterior abdominal wall block. QLB works longer than TAP, it works in average 24-48 hours, but the TAP block works for 8-12 hours. The aim was the evaluation of the analgesic effectiveness of US guided QLB in the post-operative period after unilateral open inguinal hernia repair.

**Materials and methods.** Twenty six patients were scheduled for unilateral open inguinal hernia repair. Quadratus Lumborum block was performed exclusively under US control with 30 ml of 0.25% levopobivacaine after induction of general anaesthesia. Thirty minutes after surgery each patient was assessed by using Numeric Pain Rating Scale(NPRS) where 10 is the most intense pain imaginable and 0 – there is no pain. Each patient was assessed at 1st, 3rd, 6th, 9th, 12th, 24th h after surgery. Time and intensity of pain were recorded when the patients required additional pain relief. If pain was  $\geq 4$  patients were administered Promedol.

**Results.** Twenty two patients were satisfied with QLB analgesia and NPRS was not higher than 3(30 min Median 1,00[Interquartile Range(IQR) 2];1st h Median 1,00[IQR 1]; 3<sup>rd</sup> h Median 2,00[IQR 1];6th h Median 2,00[IQR 1];9th h Median 2,00[IQR 1];12th h Median 2,00[IQR 1];24th h Median 1[IQR 1]).For 4 patients NPRS were 4 (6th h-1; 9th h-2; 12th h-1).

**Conclusion.** The Quadratus Lumborum block reliably is effective method for pain relief and allow to avoid the use of opioids in postoperative period after unilateral open inguinal hernia repair.

## COMPARISON OF MAINTENANCE, EMERGENCE AND EARLY RECOVERY PERIOD OF SEVOFLURANCE AND DESFLURANCE IN GYNECOLOGICAL SURGERIES

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**Keywords.** Sevoflurane, Desflurane, emergence.

**Objectives.** The most commonly used inhalation anaesthetic drug in Latvia for maintenance of anaesthesia is sevoflurane, but recently desflurane has entered the Latvian market, which has shown faster awakening time compared to other medicines. The aim was comparing anaesthesia maintenance by both drugs has been conducted to prove that desflurane provides shorter emergence and time spent on surgery table.

**Materials and methods.** Study was conducted at the Pauls Stradins Clinical University hospital and included 40 patients with ASA status I-II, scheduled to undergo gynaecological surgery. Patients were randomized into two similar groups: desflurane group (group D) and sevoflurane group (group S). All patients received general anaesthesia. After inducing anaesthesia with propofol, fentanyl and cisatracurium, in group D, anaesthesia was maintained with desflurane whereas in group S - sevoflurane. The dose of sevoflurane or desflurane was adjusted to maintain MAC of 1.1. Depth of anaesthesia was assessed during surgery by using brain entropy. At the end of surgery, anaesthesia was discontinued, and parameters were evaluated: time to eye opening, extubation, command execution, stating the name and time required to achieve a Modified Aldrete Score  $\geq 9$ .

**Results.** Time to spontaneous breathing ( $7.47 \pm 0.61$  vs  $8.35 \pm 0.81$  min.),  $P = 0.001$ , eye opening ( $7.65 \pm 0.6$  vs  $8.41 \pm 0.83$  min),  $P = 0.003$ , extubation ( $7.82 \pm 0.67$  vs  $8.56 \pm 1.0$ min),  $P = 0,008$ , command execution ( $8.06 \pm 0.61$  vs  $8.76 \pm 1.08$  min),  $P = 0,04$ , stating the name ( $8.25 \pm 0.66$  vs  $8.81 \pm 1.02$  min),  $P = 0,66$ , achieving Modified Aldrete Score  $\geq 9$  ( $9.63 \pm 0.55$  vs  $10.67 \pm 1.23$  min),  $P = 0,02$ , was significantly lower with desflurane-based vs. sevoflurane-based anaesthesia. Intraoperative monitoring of entropy showed equally good assurance of the depth of anaesthesia in both groups as well as similar haemodynamics.

**Conclusion.** Usage of Desflurane for anaesthesia maintenance is associated with faster emergence compared to Sevoflurane, but both anaesthetics provide equally good depth of anaesthesia and haemodynamic stability.

## AORTIC DISSECTION SUSPICION AT VILNIUS UNIVERSITY HOSPITAL SANTAROS KLINIKOS IN 2016: PATIENT ANALYSIS

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**Keywords.** Acute aortic dissection, emergency medicine.

**Objectives.** Acute aortic dissection (AAD) is a potentially deadly condition, which develops as a result of an injury to the tunica intima of the aorta. American Heart Association guidelines for AAD suggest, that physicians should always rule-out this condition for patients who present with acute somatic pain or perfusion deficit. The aim was to analyse characteristics of pain. Establish how many specialists have to see a patient to make the final diagnosis. Furthermore, investigate how many patients had been diagnosed with AAD.

**Materials and methods.** Patients who had AAD diagnosis suspected in the ED of Vilnius university hospital Santaros Klinikos and undergone CTA in the year of 2016 have been included in the study. Patients who had been complaining of pain for longer than 2 weeks have been excluded from the study. Statistical analysis was done via IBM SPSS 22.0 software.

**Results.** 159 patients have been included in the study. 101 men and 58 women. Average age was  $62.69 \pm 17.467$  years. Pain was an initial complaint for 141 patients. Average onset of pain before coming to the ED was  $37.28 \pm 69.65$  hours. 80 patients had general chest pain, 21 had complained of retrosternal pain, 20 patients presented with abdominal pain and 18 complained of back pain. 46 patients (28.93%) noted irradiation of pain. On average, before making the final diagnosis, patients were consulted by  $1.65 \pm 0.852$  doctors (median 1 doctor, ranging from 1 to 5 specialists). 10 patients (6.29%) were diagnosed with AAD.

**Conclusion.** Almost every patient complained of pain, half of them specifically presented with chest pain. Almost a third of subjects noted irradiation of pain. The number of consultants ranged from 1 to 5 before making the final diagnosis. Less than a tenth of patients have been diagnosed with AAD.

## TRANSFORAMINAL EPIDURAL CORTICOSTEROID INJECTION VOLUME IMPACT ON TREATMENT EFFICACY IN PATIENTS WITH CHRONIC UNILATERAL LUMBAR RADICULAR PAIN

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**Keywords.** Unilateral lumbar radicular pain, transforaminal epidural steroid injection (TFESI), Visual Analog Scale (VAS), Likert scale.

**Objectives.** The worldwide prevalence of lumbar radicular pain is between 5 % and 30 %. Transforaminal epidural administration of corticosteroids is an effective method for treating lumbar radicular pain. Nowadays, the effectiveness of lumbar radicular pain treatment depending on the volume of injection has not been fully investigated. The aim of this study is to compare the effect of a low-volume injection – 2 ml (Sol. Triamcinoloni acetonidum 40 mg/ml + Sol. Bupivacaini hydrochloridum 5 mg/ml) with those of a high-volume injection – 4 ml (using the same corticosteroid and bupivacaine dose + Sol. NaCl 0.9 % 2 ml) for the treatment of chronic unilateral lumbar radicular pain.

**Materials and methods.** A four months prospective randomized study was carried out at Medical Centre D.A.P. Pain Clinic, Latvia. Thirteen patients with chronic unilateral lumbar radicular pain were divided into two groups: high-volume injection group (n = 6) and low-volume group (n = 7). Posttreatment evaluation was based on VAS and Likert scale 4 weeks after procedure.

**Results.** Both groups demonstrated a significant improvement in their VAS scores after procedure ( $p < 0.05$ ). On average, the VAS score in both groups decreased by 4 points; however, there was no significant difference in the VAS scores between two groups ( $p = 0.9398$ ). The overall status of low-volume group improved by 89.8 % (using Likert scale), but for high-volume group – by 85.7 %. There was no significant difference in the results of the Likert scale between two groups after procedure ( $p = 0.6911$ ).

**Conclusion.** This study confirms the TFESI effectiveness of chronic unilateral lumbar radicular pain treatment. The results from our study showed that TFESI significantly reduced VAS and improved Likert scale scores for both groups, but there is no significant difference between injection volumes.

## A COMPARATIVE STUDY OF EPIDURAL INJECTIONS ALONE AND IN COMBINATION WITH AUTOLOGOUS PLATELET RICH PLASMA IN TREATMENT

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**Keywords.** Low back pain, platelet rich plasma, epidural steroid injections.

**Objectives.** Low back pain is a major cause of disability worldwide. Epidural steroid injections (EI) have been widely used in treatment of low back pain. Platelet Rich Plasma (PRP) is a novel therapeutic tool. The aim of the study was to compare effectiveness after EI alone and combined with PRP in treatment of low back pain.

**Materials and methods.** The prospective observational study comprised of 32 patients, 19 females and 13 males. 17 patients (PRP group) received epidural steroid injection and autologous PRP on facet joints. Control group consisted of 15 patients who received only EI. All patients received the second EI in two weeks. The evaluation included VAS (Visual Analogue Scale) and clinical improvement was assessed by the presence of stiffness of lower back, tingling sensation and night pain, before treatment, two weeks and three months after the treatment.

**Results.** At the baseline VAS score in the PRP group was  $5 \pm 2$  compared to EI group  $6 \pm 2$ , and the patients were aged  $61 \pm 15$  vs  $48 \pm 17$ . Duration of pain in PRP and control group were 38 vs 28 months. In PRP group seven patients had disc protrusion or herniation, eight had spinal stenosis, spondylolisthesis, two had facet joint pain. In control group, eleven patients had disc protrusion or herniation, four had spinal stenosis. After two weeks in PRP group the improvement was by 52% (VAS from 5 to 2.7) and by 48% (VAS from 6 to 3.4) in control group. After three months in PRP group by 64% (VAS from 5 to 2) vs 36% (VAS from 6 to 4). After three months back stiffness decreased in 40% vs 12%, night pain in 58% vs 45% and tingling in 42% vs 37% of all patients in PRP vs control group.

**Conclusion.** EI combined with PRP injections in facet joints could be more effective in treatment of low back pain.

## DRUG INTOXICATION CASE IN EMERGENCY MEDICINE SERVICES

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**Keywords.** Medical intoxications, acute poisoning, emergency medical services.

**Objectives.** The pharmaceutical substances on daily basis are on the rise - From sleeping pills to antidepressants etc. It is easy to become intoxicated by exposing oneself to an increased dosage of these medications; the consequence is an acute poisoning. The aim of the study is to find out the medical intoxication incidences.

**Materials and methods.** A retrospective study by analysing accident and emergency service data from a region of Riga with cases of a pharmaceutical drug overdose in period from 01/01/2017 - 31/12/2017.

**Results.** Total 504 cases were diagnosed, out of which, 210 cases (42%) were men and 294 (58%) women, both in the average age of 39.7 years. 146 (29%) intoxication accidents were in an age group from 36-50 years. 142 (28%) cases from 51-70 years. 78 (15%) cases in the age group 0-20 years. 46 (9%) cases in the age group 71-90 years. 179 (36%) cases were with an alcohol presence in the patient's blood. 246 (49%) cases were identified as a suicide attempt, 231 (46%) just an accident. 23 (4%) cases without unknown origin. 320 (63%) cases the intoxication with an epileptic, sedative or sleeping pill. 73 cases psychotropic substances. 36 cases with diuretic pills. 34 non-opioid, analgesic, antipyretic, antirheumatic substances. 13 intoxications were linked to topical medication. 11 cases hormonal medicaments. 4 cases with antibiotics. 2 case antiseptic, antiparasitic substances. 77 (46%) of the cases emergency services were called by the patient's mother, 53 (32%) cases the caller was the patient themselves. 428 (85%) cases the patient had been admitted to the hospital and 29 (6%) cases patient staid at home. 2 cases the outcome was fatal. Gastric lavage performed in 94 (19%) cases. 28 cases used invasive ventilation of the lungs, in 15 cases non-invasive ventilation of the lungs.

**Conclusion.** Usually intoxication victims were women. The most vulnerable age group 36-50 years. The most intoxication cases were diagnosed with an epileptic, sedative or sleeping pills.

## INITIAL PROCALCITONIN AS SEVERITY AND PROGNOSTIC MARKER IN SEPSIS PATIENTS

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**Keywords.** Sepsis, pneumonia, procalcitonin.

**Objectives.** Severity and outcome of sepsis patients depends a lot on the level of dysregulation of body response to infection. Procalcitonin (PCT) is a reliable marker of inflammatory response, so potentially could be used to assess severity and outcome of sepsis patients. The aim of this study was to investigate the initial PCT level correlation with severity and outcome in pneumonia induced sepsis patients in the Intensive Care Unit (ICU).

**Materials and methods.** Medical records were retrospectively studied, and data collected from patients with severe pneumonia admitted to the ICU of Pauls Stradins Clinical University hospital (Riga, Latvia) during 2016 - 2018. The correlation between PCT level on admission to the ICU and severity and outcome variables were investigated using statistical analysis (with SPSS software).

**Results.** There were no significant differences in PCT level in survivors and non-survivors (6.74 [5.77-55.15] vs 5.95 [2.50-101.05];  $p = 0.9$ ). There was no correlation between PCT and length of stay in the ICU [ $r = -0.24$   $p = 0.30$ ). There also were no differences in PCT level in groups divided according to severity (SOFA Score ranges). No significant correlation was found between PCT and blood lactate level ( $[r] = 0.36$   $p = 0,11$ ). A statistically significant negative correlation between PCT and WBC was found ( $[r] = -0.47$ ,  $p = 0.03$ ).

**Conclusion.** Initial PCT level could not be used as a reliable marker of severity or outcome in ICU pneumonia induced sepsis patients. However, a negative correlation between PCT and WBC was found indicating that leukopenia is associated with higher level of PCT.

## DYNAMIC CHANGES OF C-REACTIVE PROTEIN AND PROCALCITONIN SERUM LEVELS IN ICU PATIENTS

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**Keywords.** C-reactive protein, procalcitonin, sepsis, intensive care unit.

**Objectives.** Procalcitonin (PCT) and C-reactive protein (CRP) are well known markers of inflammatory response routinely used in ICU. Previous studies show a broad interindividual variations in serum levels of both markers during the first days of ICU stay. The time-based analysis of PCT and CRP serum levels could show a different pattern in patient with and without sepsis. The aim of our study was to compare CRP and PCT level dynamics changes in ICU patients with and without sepsis.

**Materials and methods.** A retrospective analysis of medical files of patients admitted in Intensive Care unit of Riga East Clinical University Hospital at 2016 – 2017. PCT and CRP levels dynamic changes were compared during the first 10 days from admission between patients with confirmed sepsis and with no sepsis. Statistical calculations were made with IBM SPSS v24 software, PCT and CPR levels are expressed as median and IQR.

**Results.** In total, study included 73 patients; 37 (51%) in "septic" and 36 (49%) in "non – septic" group. It was significant difference between groups in CRP level change at day 2-4 ("septic" group -129.8 mg/l [-206.41; -19.82 mg/l] vs "non-septic" group -50.94 mg/l [-102.84; -0.78 - mg/l]; p = 0.026). The same difference between groups was found also in PCT levels at day 2-4 ("septic" group -6.00 ng/ml [-21.74; -2.01 ng/ml] vs "non-septic" group -0.14 ng/ml [-1.74; -0.025 ng/ml]; p < 0.001).

**Conclusion.** ICU patients with confirmed sepsis have higher amplitude of PCT and CRP serum levels changes at day 2-4 than patients without sepsis.

## IMPACT OF FLUID OVERLOAD ON ACUTE KIDNEY INJURY IN PATIENTS UNDERGOING CARDIOPULMONAL BYPASS SURGERY

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**Keywords.** Fluid overload, acute kidney injury, cardio-pulmonary bypass, serum creatinine.

**Objectives.** Acute kidney injury perioperatively complies 40% of all acute kidney injury cases. Acute kidney injury increases mortality, significantly prolongs hospital stay and raises financial burden. Cardiothoracic patients, who undergo surgery under cardio-pulmonary bypass, have a high risk of developing cardio-renal syndrome and approximately 15% acquire acute kidney injury. It is considered that a significant risk factor for perioperative development of acute kidney injury in patients undergoing cardio-pulmonary bypass surgery is cardio-pulmonary bypass duration and fluid overload. The aim of this study is to determine early postoperative fluid overload importance on acute kidney injury and its detection.

**Materials and methods.** This prospective, observational, single-centre study comprised 47 patients undergoing cardio-pulmonary bypass surgery. We observed patients' diuresis, serum creatinine levels and how these indicators correlate with fluid balance during the surgery, within the first twenty-four hours after the surgery and central venous pressure.

**Results.** We analysed 47 patients. The mean age of the patients was 66.79 ( $\pm$  11.3) years from which 51.1% ( $n$  = 24) were women. We observed a tendency towards correlation between second day serum creatinine and first postoperative day fluid balance ( $p$  = 0.081). Statistically significant correlation was between second day serum creatinine and third to sixth postoperative hour central venous pressure values ( $p$  = 0.028). Longer duration of cardio-pulmonary bypass caused higher postoperative serum creatinine results ( $p$  = 0.049). However, there was no significant first postoperative day serum creatinine correlation on fluid balance during operation ( $p$  = 0.341) and diuresis during operation ( $p$  = 0.423).

**Conclusion.** Assessment of fluid overload importance on acute kidney injury development, using serum creatinine assay is noninformative. It is possible that changes in serum creatinine appeared late, because they correlate with previous day fluid overload, central venous pressure and diuresis values.

## TRAUMATOLOGY, ORTHOPAEDICS, SPORTS MEDICINE

### CHARACTERISATION OF MORPHOLOGY IN MUSCULUS SEMITENDINOSUS TENDON USED FOR ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A PILOT STUDY

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**Keywords.** Anterior cruciate ligament (ACL), plastic surgery, musculus semitendinosus, tendon, tissue factors.

**Objectives.** ACL rupture is very common in athletes. In general population incidence is approximately 33 per 100 000 people. The aim of the study was the evaluation of morphological changes in the musculus semitendinosus tendon used for the reconstruction of ACL to understand quality of most common for surgery used material.

**Materials and methods.** The materials were obtained from four ACL autologous hamstring reconstruction surgeries. Tissue were stained with hematoxyllin and eosin and with immunohistochemical (IMH) staining of PGP9.5, VEGF, collagen I and collagen III. The material was evaluated with semiquantitative method.

**Results.** Routine staining showed practically unchanged tendon structure, with one exception when sclerotic blood vessels were observed in endotenon. Collagen III IMH demonstrated moderate to numerous positive collagen fibres in two cases, but in other two there were only few positive structures seen. Collagen I IMH showed few to moderate number of positive collagen fibres in all cases. In two cases moderate number of PGP 9.5 positive nerve fibres was observed and in two other cases occasional to few number of positive structures was detected. PGP 9.5 marked higher number of nerve fibres in peritenon than in endotenon. Numerous VEGF positive endotheliocytes were observed in two cases but in two other cases VEGF positive endotheliocytes were occasional.

**Conclusion.** Tendon of musculus semitendinosus displays two patterns of distribution of tissue ischemia, neuropeptide containing innervation and collagen I and III, where collagen III is thought to be evaluated as a response of tendon to the ischemia and intensive innervation, while increase of collagen I probably is related to the relatively unchanged vascularity and innervation. The pattern of musculus semitendinosus tendon structural changes seems to be connected to the individual homeostasis in patients persisting before the usage of tendon for the reconstruction.

## DEFORMATION IN ELASTIC PANELS OF SMART GARMENT WHEN IMITATING THE SELF-CORRECTIVE MOVEMENTS OF PATIENTS WITH IDIOPATHIC SCOLIOSIS

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**Keywords.** Scoliosis, smart garment, sensors.

**Objectives.** The aim of the study is to examine the range of deformation in panels of smart garment with different elastic properties when imitating the Self-Corrective movements of patients with Idiopathic Scoliosis to fit the deformation distance in the range of linear activity of stretch sensors.

**Materials and methods.** The study included the 3 D scanning of the body shape of the volunteer able to repeatedly take the position of the body to reliably mimic the deviation in distances between anatomical markers characteristic to IS patients in self-corrective movements. The methodology of scanning was adopted from the previous research with the 5 repetitions of new position after second 10 rest between. The changes of the distance in the range of linear activity of sensors where isolated. At the second stage the panels from the materials of different elastic fabric equipped with stretch sensors where attached to the garment at the positions of markers demonstrating deviation in the range of linear activity of sensors. The measurements of stretch sensor and deviation recorded by repeated scanning of the body where compared.

**Results.** By the measuring the deviation between anatomical points / markers on the body of volunteer it was possible to achieve pattern of the position changes to demonstrate consecutive deviations in distances. The range of deviation in several distances reliably repeated the patterns of deviation in patients with scoliosis while performing self-corrective movements. It was possible to find the correlation between the readings of sensors and changes of distances.

**Conclusion.** The positioning of the sensors at the anatomical points where deviation of distance are within the range of linear sensor deformation provides the correspondence between the readouts of the sensors and changes of distances

## ACUTE KNEE INJURY: ARTHROSCOPIC DIAGNOSIS AND TREATMENT

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**Objectives.** The aim of the development of a differentiated approach in the diagnosis and treatment of knee injuries in the acute period, predicting the course and complications of injuries, by studying the biochemical parameters of hemosynovial fluid, half-AOS system, the use of early diagnosis and therapeutic arthroscopy.

**Materials and methods.** 41 patients were examined. Women 32 men 9. The median age was 36.6 years (18 to 43 years). In all patients, a biochemical study of hemosynovial fluid was conducted to determine the markers of inflammation and destruction. All patients underwent MRI. Arthroscopy imaging in all patients identified following Intra articular change: hematrosis 100% meniscus injury, 81% of the injuries of the synovial membrane, 92% of ACL injuries 21% cartilage injuries condylus 72%. At a low level of inflammation arthroscopy was performed without complications. At a high level of inflammation at the highest level, conservative treatment and further arthroscopy were performed, which ended with 30% complication (restriction of movements, lameness, stiffness, chronic pain).

**Results.** Determination of the level of peroxidase catalyst oligopeptides with CRP and IL 1 confirmed the presence of inflammation occurring with the activation of the POL-AOC system in acute knee injury, which makes it possible to predict the development of early degenerative processes.

**Conclusion.** Early arthroscopy in the primary treatment of patients with acute knee injuries is not only a method of choice and diagnosis, but also allows for early and pathogenetically sound treatment.

## EVALUATION OF VARIOUS HIP ENDOPROSTHESIS TYPES PRIOR TO REVISION HIP ARTHROPLASTY

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**Keywords.** Hip arthroplasty, revision arthroplasty, endoprosthesis.

**Objectives.** Hip arthroplasty is a widely used method for treating osteoarthritis of the hip joint and femoral neck fractures. However, complications after surgery occur, with varied time periods for each case, therefore evaluation of intervals between primary implant placement and revision arthroplasty was carried out to provide insight into potential functionality of each implant type. The aim of the study was to acquire data about revision hip arthroplasty cases during 2015 – 2017, primary prosthetic type, date of operation, time until revision was required, patient epidemiological data.

**Materials and methods.** Data about 128 patients who underwent revision hip arthroplasty during 2015–2017 in a single tertiary healthcare institution were acquired by retrospective analysis of patient files and included in the study. Time between primary arthroplasty and revision was divided into four intervals : ≤1, 2-5, 5-10, >10 years and labeled: early, early-delayed, delayed and late complications.

**Results.** Among 128 patients the male to female ratio was 1 : 1,8 (n = 45 : 83), median age: 75 years. 46% of primary arthroplasties were total cemented (n = 59), 32% cemented hemiarthroplasties (n = 41), 13% total hybrid (n = 16), 9% total uncemented (n = 12). Early revision was necessary in 46 cases: 18 after cemented hemiarthroplasty, 15 total cemented, 10 hybrid and 3 total uncemented. In the 2-5 year period complications were present in 24 cases: 11 after cemented hemiarthroplasty, 9 total cemented, 0 total hybrid, 4 total uncemented. In the 5 – 10 year period were 32 cases : 9 after cemented hemiarthroplasty, 19 total cemented, 2 total hybrid, 2 total uncemented. Late complications (>10 years) were seen in 26 cases: 3 in cemented hemiarthroplasty, 16 in total cemented, 4 total hybrid and 3 total uncemented.

**Conclusion.** Total cemented prostheses were revised the most and revision count was evenly distributed among the observed time periods. Highest tendency for complications within the first year was observed in patients that underwent cemented hemiarthroplasty.

## EXPERIENCE IN SURGICAL TREATMENT OF PATELLAR INSTABILITY

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**Objectives.** The aim was to determine the indications for open surgery and to create an optimal treatment for patellar instability.

**Materials and methods.** 31 cases of patellar instability were recorded in the department of traumatology and orthopedics of the TMA from 2015 - 2018. Males - 12, females - 19. The median age was  $27 \pm 5.1$ . Among them - 5 cases of traumatic patellar dislocation without signs of dysplasia, 14 - dislocation with dysplasia signs (rotation, axial deformation, with an increase in the Q-angle), 12 - patellar instability. All patients underwent axial X-ray by Merchant method, CT and MRI. Patients with traumatic patellar dislocation underwent arthroscopic intervention - Yamamoto's operation. Patients with patellar dislocation with signs of dysplasia or recurrent dislocation underwent open surgery with minimally invasive restoration of the medial patellofemoral ligament by autograft and medialization of the patellar ligament by Elmslie-Trilatt. In the diagnosis of patellofemoral osteoarthritis was performed anteromedialization of the tibial tuberosity to reduce patellofemoral conflict. Patients started early development of the joint on the 3rd day, the exertion of the joint began from the 3rd month. The assessment of joint function was carried out before the operation, after 3, 6, 12 months with using the Kujala questionnaire (1993).

**Results.** Among the group of patients after combined surgery, 87% of the results are successful with complete recovery of joint function, 9% - satisfactory with a slight limitation of joint function, 4% of patients after Yamamoto's surgery showed signs of instability.

**Conclusion.** MRI is a main diagnostic method of patellar instability, as it assesses the presence of injury and the presence of comorbidities. In case of patella instability in the presence of patellofemoral dysplasia, a combined operation on soft tissue and bone structures of the knee joint is necessary.

## **FRACTURE HEALING IN OSTEOGENESIS IMPERFECTA (OI) PATIENTS, THEIR OPINION ON USING 3D PRINTED FRACTURE FIXATION DEVICES OVER REGULAR CASTS**

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**Keywords.** Osteogenesis Imperfecta, fracture fixation, casts, CastPrint.

**Objectives.** People affected by OI experience many fractures in lifetime due to a mutation in genes that are responsible for collagen production. Regular casts (plaster, fiberglass) have been the gold standard for fixation of simple fractures. However, usage of heavy, non-breathing, nonwaterproof casts is not comfortable and early rehabilitation is not possible. With the development of 3D technologies, new solutions are available such as CastPrint that provides light, waterproof, personalized casts for patients.

**Materials and methods.** 43 OI patient (type I - 20, II - 1, III - 9, IV - 8, V - 1, n - 4) from 9 countries were interviewed in September, October 2018 using a questionnaire. They were asked about their age, OI type, frequency of fractures, most common location of fractures, causes, commonly used fracture fixation techniques, satisfaction with these, opinion on CastPrint 3D printed fixation devices, their preference between regular casts and CastPrint and possible preventive scanning of their extremities.

**Results.** Patients were aged 18 - 72, average age - 42. Patients have had 11 - 400 fractures in their lives. Average - 132. Most common causes of fractures - falling, tripping, weight bearing. Locations - wrist, lower arm, lower leg, ribs. 90.69% patients have used casts for fracture healing, 69.76% - surgeries, 11.62% - splints. 51% have not been satisfied with regular casts. 72.09% would choose CastPrint over regular casts. 74.41% would be ready to preventatively scan their extremities to print CastPrint when needed.

**Conclusion.** The number of fractures in patients is very high, but satisfaction of treatment is not. Majority would choose CastPrint over regular casts if they were offered. They would be ready to scan the most common fracture locations prophylactically. CastPrint devices could be considered to be implemented as a new fracture healing method for OI patients.

## RISK FACTORS FOR TOTAL HIP REPLACEMENT DUE TO PRIMARY OSTEOARTHRITIS

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**Keywords.** Osteoarthritis, hip arthroplasty.

**Objectives.** Need for hip replacement surgery increases. Osteoarthritis is a major cause of arthroplasty of the hip, and it accounts for about 93% of cases. Its development is facilitated by several preventable and inevitably predisposing factors.

The aim of this study is to analyze the relationship between hip replacement due to osteoarthritis and gender, body mass index, occupation, heredity, metabolic syndrome, back pain, smoking, alcohol abuse, menopause, stroke.

**Materials and methods.** A total of 50 patients planned for hip replacement surgery at Riga 2nd Hospital were interviewed using an anonymous questionnaire about their anamnesis and processed and analyzed the data obtained.

**Results.** A total of 50 patients were interviewed, of which 31 were women and 19 men. Arthroplasty of the hip are performed at 2% at the age of < 40; 6% 41-50y; 18% 51-60 y; 42% 61-70 y; 24% 71-80 y; 8% > 81 y. Osteoarthritis was 25 patients. There is no statistically significant difference between osteoarthritis and body mass index, occupation, metabolic syndrome, back pain, smoking, menopause, stroke. In the family, hip replacement surgery has been performed 2% of patients don't have osteoarthritis, and 16% have osteoarthritis, and in the absence of family hip replacement, 34% have osteoarthritis and 48% haven't osteoarthritis. Those patients who don't use alcohol 28% are osteoarthritis but 14% don't have osteoarthritis, but those who use alcohol rarely 22% have osteoarthritis and 36% haven't osteoarthritis. For women, osteoarthritis is 38%, but 24% are not osteoarthritis, 12% have osteoarthritis in men, and 26% have no osteoarthritis ( $p < 0.05$ ).

**Conclusion.** The most commonly hip replacement is done for patients 61-70 years of age. Osteoarthritis is more common in women than in men, and if a member of the family has arthroplasty of the joints. Osteoarthritis also develops more often if a person doesn't use alcohol compared to those who use alcohol rarely.

## THE IMPACT OF SMOKING ON TRAUMATIC HAND WOUND HEALING

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**Keywords.** Traumatic hand wound, smoking, infection.

**Objectives.** Smoking is considered as a significant risk factor for impaired wound healing. The aim of the study was to evaluate if smoking increases the risk of infection development in case of traumatic uncomplicated hand wounds.

**Materials and methods.** The study included 240 patients, who were hospitalized in Riga East Clinical University Hospital with traumatic uncomplicated hand wounds and underwent surgical treatment. Only patients without systemic diseases, signs of active infection in the wound and with non-bite wounds were included. To find out if patients have developed infection in the wound, follow-up was done two weeks post-operatively. The information about smoking status was obtained from medical histories. To obtain statistical data Fisher`s exact one-sided test was performed.

**Results.** The study included 240 patients, 226 responded to follow-up. 79.6% of these patients were male and 20.4% were female. The mean age was 38.7 years (range 14 – 78 years). 50.7% were smokers and 49.3% were non-smokers. Five of 226 patients developed infection in the wound, all 5 were smokers. We detected statistically significant correlation between the development of infection in the wound and patients` smoking status ( $p = 0.032$ ).

**Conclusion.** We can conclude that smoking increases the risk of infection development in case of traumatic uncomplicated hand wounds. Even only few patients develop the infection in the wound, based on our results we can recommend quitting smoking to lower the risk of infection development.

## POSTEROLATERAL APPROACH IN TREATMENT OF MALLEOLAR FRACTURES

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**Keywords.** Malleolar fractures, Surgical approaches.

**Objectives.** Fractures that involve lateral, medial malleolus and posterior tibial rim are fractures with challenging treatment and overall poor functional outcome. The aim is to compare functional and clinical midterm outcomes of the fractures treated with posterolateral (PL) approach and posterior fixation versus anterior to posterior (AP) lag screws.

**Materials and methods.** Patients, with lateral, medial malleolus and posterior tibial rim fractures, which were treated in Hospital of Traumatology and Orthopaedics in the period from January 2016 to December 2016 were identified. Only 28 patients were eligible for the study and 22 chose to participate. Patients were followed up in 2018: examination consisted of goniometric motion assessment, self-administered Short Musculoskeletal Function Assessment (SMFA), X-ray views were analyzed. We divided patients into two groups- 11 patients AP screws and 11 patients with PL approach. The data were analysed by IBM SPSS.

**Results.** The mean age of patients in the AP screws group was 60.36 (SD = 8.34) and in the PL group 53.36 (SD = 17.08) years,  $p = 0.241$ . Patients were similar with regard to the median of the follow-up and the median percentage of the tibial plafond involvement. Regarding SMFA scores (lower scores represent better function) PL group has demonstrated better postoperative results comparing the AP screws group: Function index- 1.47 (IQR 0-3.67) vs. 7.35 (IQR 2.94- 22.06),  $p = 0.028$ ; Daily activities 0 (IQR 0-0) vs. 7,5 (IQR 2.5 - 20),  $p = 0.016$ ; Mobility 2,77 (IQR 0-13.88) vs. 13.88 (IQR 8.33 - 47.22),  $p = 0.04$ . The median loss of range of motion for ankle dorsiflexion was greater in the AP screws group than in the PL group: 52.63 (IQR 40- 66.67) % vs. 7.69 (IQR 0 - 44.44) %,  $p = 0.001$ .

**Conclusion.** Patients, who were treated with the posterolateral approach and posterior fixation had superior clinical and functional outcomes, comparing those, who were treated with AP screws.

## PHYSIOLOGY, BIOCHEMISTRY, PHARMACOLOGY

### ADHERENCE LEVEL TO FIXED-DOSE COMBINATIONS AMONG ANTIHYPERTENSIVE PATIENTS

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**Keywords.** Adherence, fixed-dose combinations.

**Objectives.** Drug combinations have been successfully used in the treatment of various diseases. In this context, an important concept is fixed-dose combinations (FDC), which can be defined as a formulation of two or more biologically active substances, combined in a single medicine, and available at certain fixed doses. FDC presents several advantages, such as improvement of patient adherence and simplification of medication regimen. Medication adherence is mandatory for successful treatment of chronic disease. However, the data on comparison of FDC with free-drug regimen to improve patient's medication compliance and adherence is limited. This study, first, aimed to assess association between usage of FDC medications and patient's medication adherence level, and, second, to assess other with medication therapy related factors that are associated with adherence.

**Materials and methods.** This was a cross-sectional observational survey in primary care. All data were collected through face-to-face survey conducted at 6 pharmacies in Riga. The study involved 73 participants with clinically diagnosed hypertension: 50 women (68.5%) and 23 men (31.5%), all of them were taking antihypertensive medicines at least 1-year. Participants medication adherence level were assessed with Modified 8-point Morisky Scale (MMS8). All statistical tests were two-sided using a significance level of 0.05. Relationship between MMS8 and usage of FDC was detected through Pearson correlation (IBM SPSS Statistics 23.0).

**Results.** Antihypertensive patient's mean level of adherence derivated from MMS8 was 1.98 (medium adherence level). Adherence to medication was not significantly associated with usage of FDC ( $p = 0.363$ ). Correlation analysis revealed that the adherence level correlated negatively with the patient's age ( $r = -0.419$ ;  $p = 0.000$ ), duration of the disease ( $r = -0.470$ ;  $p = 0.000$ ) and total quantity of medicine ( $r = -0.258$ ;  $p = 0.028$ ).

**Conclusion.** No correlation found between FDC and adherence. Study showed that reduced number of total drugs used by participants does not relate to higher level of adherence.

## ANTISPASMODIC PROPERTIES OF QUERCETIN

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**Keywords.** Quercetin, nitric oxide, muscle contractility.

**Objectives.** Quercetin (QUE) is a natural polyphenol present in fruits, vegetables or grains. Due to its anti-diabetic, anti-oxidative or cardioprotective properties it has recently become remarkably popular subject of research. However, little is known about its effect on muscle contractility. The aim our study was to assess the effect of QUE on a contractility of a gastric smooth muscles, as well as to determine whether its action is related with the nitric oxide signaling.

**Materials and methods.** The study was conducted on a gastric snippets taken from the patients undergoing the sleeve gastrectomy due to obesity. The snippets were collected during the operation and transported to the laboratory where the layer of a smooth muscles were dissected, attached to strain gauge and placed in a tissue bath with Tyrod buffer at 37°C, pH 7.4. Muscle contraction was stimulated using carbachol (100µM). QUE was diluted in DMSO and added to the bath medium in an increasing concentrations (0.1 µM - 100 µM). Endogenous NO and cGMP synthesis were blocked using LNNA and cystamine respectively. The study composed of 4 groups: control, control + DMSO, QUE, QUE+LNNA, QUE+cystamine. The following parameters were measured: residual muscle tension, contraction amplitude and area under the curve (AUC). The results were analyzed statistically in ANOVA test and considered to be significant at  $p \leq 0.05$ .

**Results.** Exposure to QUE resulted in a significant, dose dependent, decrease of AUC and muscle tonus. Moreover, high concentrations of quercetin decreased contraction amplitude. The inhibition of endogenous NO synthesis pathway did not affect significantly the relaxant activity of quercetin.

**Conclusion.** Quercetin relaxes smooth muscles of gastrointestinal tract independently to NO. Moreover, it might explain the possible side effects of quercetin therapy related with a distorted motility of gastrointestinal tract observed in clinical studies with polyphenols.

## INFLUENCE OF POPULUS TREMULA EXTRACTS ON LIPASE ACTIVITY IN PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS.

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**Keywords.** Lipase, triglycerides, bile, salicinoids.

**Objectives.** The "Western diet" is the dominant type of nutrition in the Baltic region, it may cause disfunction of the pancreas and duodenal dyspepsia in any age group as well as this can lead to metabolic disorders such as Metabolic syndrome, obesity, gallstone disease and finally homeostasis disruptions. The aim of this study is to research Populus Tremula extract from trees growing in Latvia and other European countries on triglycerides digestion which is included in European COST CA 15135 MuTaLig programme.

**Materials and methods.** The influence of extract on lipase activity was detected by milk (3.5%) as a source of triglycerides hydrolysis with bile (model of duodenal physiological digestion phase) and no bile (model of some pathology: gallbladder disease or conditions after gallbladder removal etc.) Two types of Populus Tremula (diluted in water and ethanol) were tested: mechanochemically pre-treated extract (46% polyphenols with salicinoids as active compounds, and 30.2% monosaccharides), and un-treated extract- (21% and 30.6%). Both extracts in 2 concentrations 2 mg/L and 10mg/ml in dosage used 200 mcl.

**Results.** Plant extract in ethanol showed lipase activation in 2 mg/L and 10 mg/ml in 43% and 50% respectively, in physiological conditions compering to control work. There was no effect of both dosages in pathological conditions. Plant extract in water showed lipase activation in 2 mg/L and 10 mg/ml in 16% and 35% respectively, compering to the control work. In pathological conditions both concentrations show positive tendency forward activation of triglycerides hydrolysis.

**Conclusion.** The received data show that both extracts gathered from domestic raw can be recommended to persons with malfunction of pancreatic gland and to all elderly population. The water extract can be recommended for people with gallbladder pathology to correct lipid digestion.

## EVALUATION OF PATIENTS ADHERENCE FROM PHARMACISTS POINT OF VIEW: A QUALITATIVE STUDY

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**Keywords.** Medication adherence, adherence influencing factors, pharmacist, community pharmacy.

**Objectives.** This qualitative study aimed to gain deeper understanding about 1) pharmacists' knowledge and opinions about factors influencing patient adherence; 2) strategies used by pharmacists in community pharmacies to evaluate medication adherence and to improve it. Poor medication adherence results in excessive costs for national health system. Pharmacists can play a major role in improving medication adherence for their patients through counselling. They are competent healthcare providers who can evaluate factors that affect patients' abilities to take medications properly.

**Materials and methods.** This was a qualitative study. The data were collected through in-depth semi-structured interviews with 10 pharmacists from different community pharmacies in three territorial regions of Latvia. The interviews were audio-recorded and transcribed verbatim. Interviews were continued until data saturation was reached. Data analysis was done in Atlas.ti in two stages. First, data were coded by themes and subsequently codes were organized in overarching categories that describe pharmacists' views about adherence and strategies to improve it.

**Results.** 3 main themes were identified: 1) Pharmacists' views on factors that influence patients' adherence. The lack of time both for pharmacists and patients was mentioned as the key obstacle to in-depth conversations about used medications and adherence issues. 2) Used strategies to detect non-adherence. Pharmacists' used patient centered communication model to identify and manage non-adherence; 3) Factors that interferes with pharmacists role in improving adherence. First, the lack of recognition of pharmacists' integral role in the healthcare system. Second, work organization in pharmacy chains, and third – pharmacists' communication capabilities.

**Conclusion.** Pharmacists, who already practice for many years, need a better continuing education system to improve their knowledge and communication capabilities for every day work. Also, government must clarify pharmacists' role in health care system and stimulate collaboration between pharmacists' doctors and patients.

## COMPARISON OF PHYSICAL CHARACTERISTICS OF DIFFERENT TYPES OF MICROCRYSTALLINE CELLULOSE OF TWO MANUFACTURERS

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**Keywords.** Microcrystalline cellulose (MCC), tablets, physical properties.

**Objectives.** Pharmaceutical dosage forms contain pharmacologically active compounds and excipients added to formulate and manufacture the final dosage forms. The main function of excipients is to act as the carrier or a component, which improves the stability, bioavailability, storage quality, production of the product and patient acceptance. Excipients can be divided into several groups according to their functionality, which should be kept in mind in the technological process to obtain good dosage forms. The quality, physicochemical parameters of the final dosage forms depend on the quality of excipients and their physicochemical parameters, therefore testing of excipients is necessary and important. The aim was to determine and compare the physicochemical properties of tablet masses and tablets containing three MCC types – MCC-200, MCC-102, MCC-101.

**Materials and methods.** MCC, lactose, povidone and magnesium stearate were used for tablet preparation. Methods used for the determination of tablets quality are based on the European Pharmacopoeia 9 th edition.

**Results.** The microscopic analysis showed that each MCC type has a different crystal form. Minimal difference was observed in bulk density of used MCC types (0.59 – 0.71 g/mL). MCC types with larger particle size presented better flowability (7.3; 7.0 g/s). Friability test showed that weight loss of the tablets did not exceed 1 %. Avicel MCC series containing tablets disintegrated faster than Vivapur MCC series tablets, only tablets within MCC-200 series disintegrated nearly simultaneously.

**Conclusion.** The study of the physicochemical properties of tablets containing different MCC types showed differences in the properties of tablets with different types of MCC and in different manufacturer same type MCC tablets.

## THE IMPACT OF BIOMATERIALS USED IN AESTHETIC MEDICINE ON THE ACTIVITY OF ENZYMES IN DIGESTION

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**Keywords.** Biomaterials, digestive enzymes, digestion.

**Objectives.** The aim was to study the influence of DYSPOORT 500U on enzyme activity of salivary amylase, gastric pepsin and pancreas lipase.

**Materials and methods.** The evaluation of DYSPOORT 500 U impact on digestion system enzymes was conducted using standard methods of digestion in oral cavity, gaster and duodenum. 500 DYSPOORT Units were diluted in 10ml of 0.9 % NaCl, therefore in 0.1 ml of diluted solution were 5 U. Amyloclastic force (amylase activity) was tested using salivary amylase before (control) and after throwing in 50 U. Pepsin activity was analysed in physiologic conditions, using casein as substrate, before and after addition of 25 U in one test-tube and 50 U in another. The activity of pancreatic lipase was explored on the hydrolysis of triglycerides using titration method in physiologic conditions (with bile), adding 25 U, and in non-physiological duodenal phase model (without bile), adding 25 U.

**Results.** Using 50 U of DYSPOORT showed reduction of amyloclastic force for 87.5% from 2560 ml in control group to 320 ml. Pepsin activity test in control showed no hydrolysis of peptic bonds, but adding 25 U exhibit casein swelling and hydrolysis, which was even more significant in 50 U. Lipase was inhibited for 20% in physiological condition and 19.9% without bile.

**Conclusion.** Conducted research showed, that DYSPOORT 500 U has inhibitory effect on amylase and lipase activity, which proves that it should be inserted with special care, with knowledge of topographical anatomy, particularly around zones where drug can reach digestion tract.

## TOTAL POLYPHENOL CONTENT AND ANTIRADICAL ACTIVITY OF CELERY, DILL AND PARSLEY LEAVES

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**Keywords.** Antioxidants, antiradical activity, polyphenols, parsley, dill, celery.

**Objectives.** In recent years, healthy nutrition and the use of local spices have become increasingly popular. Spices can be used fresh during the summer months and dried or frozen for use in the winter. Oxidative stress is common in our society mainly because of psychological stress, pollution and our lifestyle. Oxidative stress causes health issues such as coronary disease, atherosclerosis and skin aging. Celery, dill and parsley contain polyphenols that work as antioxidants and decrease oxidative stress.

The aim of this study was to find out which of the most commonly used spices (celery, dill or parsley) in Latvia contains more polyphenols and have best antiradical activity.

**Materials and methods.** Dried and fresh celery (*Apium graveolens*), dill (*Anethum graveolens*) and parsley (*Petroselinum crispum*) leaves were used in this study. Three solvents namely water, methanol and ethanol were used to prepare the extracts. The total polyphenol content was determined using Folin-Ciocalteu reagent. Antiradical activity was analyzed by the 2,2-diphenyl-1-picrylhydrazyl assay.

**Results.** The content of phenolic compounds in dried celery, dill and parsley was higher than in fresh plant material. The total polyphenol content in analysed samples ranged from 988.7 (dried celery in methanol) to 46.0 (fresh celery in methanol) mg gallic acid equivalent (GAE) 100 g<sup>-1</sup>. The content of phenolic compounds decreased in order dried celery in methanol>dried celery in ethanol>dried celery in water>dried parsley in ethanol. The value of DPPH antiradical activity ranged from 94.6% (fresh dill in methanol) to 6.1% (dried parsley in water).

**Conclusion.** Dried celery, dill, and parsley leaves contain more phenolic compounds than fresh material. All spices showed antiradical activity. The highest antioxidant activity is shown by fresh dill extract in methanol.

## DETERMINATION OF BLOOD PRESSURE AFFECTING NON-PRESCRIPTION MEDICATIONS AND FOOD SUPPLEMENTS AND LATVIAN CITIZENS' AWARENESS OF THEIR POSSIBLE NEGATIVE ASPECTS

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**Keywords.** Hypertension, food supplements, over-the-counter medicine.

**Objectives.** Even slightly elevated blood pressure is a risk factor for cardiovascular disease, which's the leading cause of mortality in the world. In 2017, 15838 people died of cardiovascular disease in Latvia, which's 55.7% of all deaths. This's an important indicator that people, have to pay attention to every possible blood pressure raising factor. Thoughtful drug therapy could significantly reduce mortality. The aim was to clarify those dietary supplements and over-the-counter medications that raise blood pressure and Latvian hypertensive patients' awareness of their safe use.

**Materials and methods.** There were identified blood pressure raising substance containing medications in the Medicinal Product Register of Latvia (MPRL) and there were also identified medicinal plant (licorice) containing products that could possibly affect blood pressure in the Food supplement register of Latvia (FSRL). An anonymous, quantitative survey of patients with hypertension was conducted in health centre, pharmacy and online questionnaire from 1 to 18 January 2019. In the study 244 patients were included. Self-constructed questionnaire was used. The data were analysed in Microsoft Excel and IBM SPSS.

**Results.** Possible blood pressure raising over-the-counter medicines were found in the MPRL. These drugs contain pseudoephedrine (n = 11), ibuprofen (n = 37), paracetamol (n = 49). 252 licorice products were found in FSRL. Only 20.5% of Latvian hypertensive patients are convinced, that pseudoephedrine but 63 % - that caffeine increases blood pressure. The vast majority believe that uncontrolled, high blood pressure can cause stroke (87.7%), heart attack (86.5%), sudden death (73%), heart failure (54.5%), loss of vision (45.1%). 3 out of 6 hypertensive patients who received pseudoephedrine had side effects - nose bleeding, dizziness and nausea.

**Conclusion.** Several non-prescription drugs (pseudoephedrine, ibuprofen, paracetamol) and food supplements (licorice) may increase blood pressure. Overall hypertension patients in Latvia aren't informed enough about the potential effects of dietary supplements and over-the-counter medicines on blood pressure.

## SYNTHETIC AND NATURAL LIPID LIPOSOMES INTERACTION WITH PHOSPHOLIPID MODEL MEMBRANE IN LANGMUIR MONOLAYER

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**Objectives.** The aim of this work was to design a Langmuir monolayer based on dipalmitoylphosphatidylcholine (DPPC) and cholesterol similar to a cell membrane to study liposomes-membrane interaction. The second objective - obtain and characterize liposomes properties - size and zeta-potential, composed of different lipids and their combinations (DOTAP:DOPE, DSPC:DSPG, DSPC:Cholesterol, DSPC:Cholesterol:DSPE-PEG2000 and synthetic cationic amphiphiles based on 1,4-dihydropyridine) and their interaction with the model membrane. The third objective was to investigate influences of different experimental conditions on liposomes-membrane fusion: temperature, subphase composition, pH and model membrane lipid composition.

**Materials and methods.** Surface pressure-area isotherms and surface pressure-time isotherms were obtained with a KSV NIMA trough (KSV, Finland). Liposomes solutions were obtained by thin film method with the following sonication and extrusion. Liposomes size and zeta-potential were measured by dynamic light scattering technique (Malvern Zetasizer Nano ZSP).

**Results.** The best composition of model membrane to study is 25 mol% cholesterol and 75% DPPC because its cholesterol content is similar to plasma membrane and is stable enough. Obtained liposomes have the average size of approximately 100 nm and zeta-potential values depending on lipid composition. Positively charged liposomes composed of DOTAP:DOPE and synthetic cationic amphiphiles based on 1,4-dihydropyridine, as well as negative DSPC:DSPG liposomes fuse with the model membrane but neutral liposomes - DSPC:Cholesterol or pegylated DSPC:Cholesterol liposomes do not interact with the model membrane.

Addition of negatively charged lipids to the composition of a monolayer significantly improves interaction with positively charged liposomes and completely inhibits interaction with negatively charged ones. Liposome fusion with a monolayer is temperature dependent and is almost fully inhibited at 4 °C.

**Conclusion.** Liposome interaction with the monolayer seems to be mostly electrostatic as it is enhanced in the presence of salts and buffers as well as influenced by subphase pH. Fusion of liposomes with the monolayer is also influenced by temperature fluctuations.

## PAEDIATRICS

### INCIDENCE OF COMPLICATIONS AFTER TONSILLECTOMY, TONSILLOTOMY AND ADENOTOMY IN CHILDHOOD IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL FROM 2013 TO 2017

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**Keywords.** Adenotomy, tonsillectomy, tonsillotomy, complications.

**Objectives.** The objectives of my research are to determine the incidence and what kind of complications happen after tonsillectomy, tonsillotomy and adenotomy in Latvian Children's Clinical University Hospital, because these are one of the most common surgeries in paediatric otolaryngologist practise and also in general, to ephasise the need for evaluation before the surgery.

**Materials and methods.** Research was retrospective and statistical. Analysis included randomly chosen 800 patients out of 3252 surgeries done in last five years in Latvian Children's Clinical University Hospital. It included patients aged from 1 to 17 years who underwent tonsillectomy, tonsillotomy and adenotomy surgeries. Data were obtained using data base Andromed.

**Results.** During last 5 years, there were 3252 adenotomy, tonsillectomy and tonsillotomy surgeries. From 800 randomly selected patients, 494 (62%) patients had only adenotomy, 193 (24%) had adenotomy and tonsillotomy, 51 (6%) only tonsillectomy, 42 (5%) adenotomy+tonsillectomy and 20 (3%) patients had only tonsillotomy. Most of the surgeries were done in 2014 - 184 (23%), following 2013 with 178 (22%) surgeries and 2015 with 177 (22%). Between all the patients complications due to which patients were hospitalized in otolaryngology department had 41 (5%) patients, of which 14 (32%) had only bleeding, only discomfort feeling in throat had 10 (23%) patients and 6 (14%) had only vomiting, there were also other complications such as temperature, throat pain, headache and stomachache. Overall bleeding were observed 1,7% of all the patients, discomfort feeling in throat - 1,25%.

**Conclusions.** Complications following tonsillectomy, tonsillotomy and adenotomy are not very common, but they are not rare also, therefore it is very important to evaluate patient and estimate indications before surgery. The most common complication is bleeding, which is life threatening complication. Other complications found in the study were discomfort feeling in throat, vomiting, throat pain, headache, stomachache, temperature and problems with feeding.

## IMPACT OF UNDERNUTRITION ON PEDIATRIC INTENSIVE CARE UNIT PATIENT OUTCOMES

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**Keywords.** Anthropometric data, nutrition, pediatric intensive care

**Objectives.** Several studies have shown that undernourished patients admitted to Pediatric Intensive Care Unit (PICU) have worse outcome compared to other patients with normal weight-for-age (WFA). The aim of this study is to identify whether critically ill children with low WFA have worse outcomes than patients with normal WFA.

**Materials and methods.** This retrospective descriptive study involved all patients aged < 5 years of age who were admitted to Pediatric Intensive Care Unit at Children's Clinical University Hospital from December 1, 2017 to December 1, 2018. The primary outcome of this study was considered as patient alive and at normal residence 30 days after discharge from PICU. Clinical data were collected from electronic medical records (IntelliVue Clinical Information Portfolio, Phillips) and collated by using The Paediatric Intensive Care Audit Network (PICANet). WFA z-scores were calculated by using WHO charts. Statistical measures (Mann-Whitney U test, Chi-square test) were calculated by using IBM SPSS Software. P value less than 0.05 was considered significant.

**Results.** A total of 567 patients were included in the study. Median WFA z-score for patients who 30-day post-discharge were alive and at normal residence (N = 470) was -0.21 (IQR: -1.29-0.74), but for patients with other outcome (N = 97) it was -0.9 (IQR: -2.01-0.59) (p < 0.001). Median WFA z-score for patients with planned admission to the PICU (N = 242) was -0.61 (IQR: -1.67-0.36), but for patients with emergency admission to PICU (N = 325) was -0.05 (IQR: -1.15-1.05) (p < 0.001). Median z-score for patients who were discharged from PICU alive (N = 551) was -0.33 (IQR: -1.39-0.74), but for those who died in the PICU (N = 16) it was -1.63 (IQR: -3.38- -0.83) (p 0.005).

**Conclusions.** Lower WFA is associated with worse clinical outcomes of the patients who were admitted to the PICU.

## IS MORTALITY INFLUENCED BY TIME OF ADMISSION TO PEDIATRIC INTENSIVE CARE UNIT IN LATVIA – A 5 YEAR EVALUATION

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**Keywords.** Paediatric Intensive Care Unit, Patient Safety, Time of admission

**Objectives.** Some studies have shown that there are critical times of admission to PICU that can result in worse patient outcomes. The aim of this study was to explore whether time of admission to the PICU is linked to mortality in Children's Clinical University Hospital.

**Materials and methods.** This was a retrospective cohort study. Patient data were extracted from IntelliVue Clinical Information Portfolio (ICIP; Phillips) covering the time period from January 1, 2012 to December 31, 2016. Time of admission to PICU, age, gender, duration of stay and mortality data were recorded. We used Paediatric Index of Mortality 2 (PIM2) score for risk-adjustment. In-hour was defined as time of admission from Monday to Friday from 08.00 to 16.59. In addition, we explored whether mortality is linked to admission in a specific time of day. Descriptive statistics using T test, Mann Whitney test,  $\chi^2$  test were performed. Backward likelihood ratio was used to identify model determinants.

**Results.** A total of 3642 children < 18 were included, of those 2042 were admitted in-hour and 1600 were admitted out-of-hour. In binary regression time of admission was associated with patient outcome. It was noted that morning hours (0600–0959) admission had the highest adjusted mortality while afternoon admission showed lowest adjusted mortality, hence the afternoon admission mortality was used as baseline for comparisons. Unadjusted out-of-hour admissions showed increased mortality (OR 1.87; 95% CI: 1.20–2.92), but the significance was lost after adjusting for PIM2 (OR 0.91; CI: 0.52–3.23). Adjusted morning admission resulted in OR 3.72 (95% CI: 2.79–5.13).

**Conclusions.** We discovered that in Children's Hospital patients admitted to the PICU in the morning hours had significantly increased risk dying. This information is extremely important for planning staffing, hand-over and patient monitoring overnight.

## PEDIATRIC CARDIAC INTENSIVE CARE OUTCOMES IN LATVIA FROM 2008 TO 2018

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**Keywords.** Pediatrics, Cardiac intensive care, Outcomes.

**Objectives.** Child mortality is one of the most important health care indicators. In the pediatric intensive care unit, which can directly influence this parameter, one-fifth of all patients is with cardiovascular pathologies, but pediatric intensive care outcomes in children who suffer from cardiovascular diseases in Latvia have not been systematically measured. The objective of this study was to analyze pediatric cardiac intensive care outcomes in Latvia over eleven-year period.

**Materials and methods.** In a retrospective analysis, admission data from the pediatric intensive care unit (PICU) of Children's Clinical University Hospital were screened to gather patients admitted for cardiovascular pathologies. Clinical data for the period from 01/01/2008 to 31/12/2011 were collected from paper medical records and for period from 01/01/2012 to 31/12/2018 from electronic medical records (IntelliVue Clinical Information Portfolio; Phillips). Descriptive statistics were done by using Microsoft Excel (v15.26) and SPSS Statistics (v23.0) software.

**Results.** A total of 8369 PICU patients were reviewed and further divided into two diagnostic groups: cardiovascular patients (N = 1490) and other (non-cardiovascular or general population) patients (N = 6879). The overall in-PICU mortality in cardiovascular group was 5.0% (n = 74), while in general population group - 3.2% (n = 222), (p = 0.001). Patients with cardiovascular disease who died (N = 74) in the PICU compared to survivors (n = 1416) were younger (median age 4.53 and 20.92 months, respectively; p < 0.001). Mortality data of cardiovascular group according 11-year period is as follows: 2008-13.9% (n = 17), 2009-8.3% (n = 14), 2010-11.0% (n = 14), 2011-2.3% (n = 3), 2012-5.5% (n = 6), 2013-4.1% (n = 5), 2014-2.9% (n = 4), 2015-2.2% (n = 3), 2016-3.7% (n = 5), 2017-1.4% (n = 2), 2018-0.7% (n = 1), (p < 0.001; OR 0.78 [95% CI: 0.72-0.85]).

**Conclusions.** Our analysis demonstrates that patients with cardiovascular disease have higher mortality than general PICU population, but the in-PICU mortality of cardiovascular patients from 2008 to 2018 had tendency to decrease.

## ETIOLOGY AND CLINICAL PRESENTATION OF NEUROINFECTIONS IN CHILDREN ADMITTED TO CHILDREN'S CLINICAL UNIVERSITY HOSPITAL FROM 01.2017 TO 12.2018

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**Keywords.** Children, neuroinfections, enterovirus, acute flaccid paralysis

**Objectives.** Neuroinfections are infectious diseases, which are characterized by damage of central nervous system, most commonly caused by viral or bacterial agents and typically presents with fever, meningeal symptoms, headache and altered mental status. The aim of this study was to review and analyse the etiology and clinical presentation of meningitis, meningoencephalitis and meningoencephalomyelitis.

**Materials and methods.** We retrospectively analysed all medical records for pediatric patients admitted to Children's Clinical University hospital with neuroinfections from 01.2017 to 12.2018. MS excel and SPSS statistics were used for data analysis in this study.

**Results.** 106 patients were included in this study. Three forms of neuroinfections were observed: meningitis - 80% (n = 85), meningoencephalitis - 18% (n = 19) and meningoencephalomyelitis - 2% (n = 2). 51% (n = 54) of all patients had virus as etiological agent, following with bacterial - 20% (n = 21), viral and bacterial coinfection - 2% (n = 2) and unknown etiology - 27% (n = 29). Enterovirus was the most commonly detected viral agent (40%, n = 42) and *Borrelia burgdorferi* (6%, n = 7) was the most commonly detected bacterial agent. We observed following clinical manifestations: headache in 57% (n = 60) of all patients, vomiting in 64% (n = 68), lethargy in 69% (n = 73), sleepiness in 50% (n = 53), meningeal symptoms 51% (n = 54), febrile temperature in 70% (n = 74). 5 patients had acute flaccid paralysis - in 4 cases causative agent was enterovirus and 1 case it was coinfection between enterovirus and *Borrelia burgdorferi*.

**Conclusions.** The most common detected viral agent was enterovirus (40%, n = 42) and bacterial was *Borrelia burgdorferi* (6%, n = 7), still many of agents remain unknown 27% (n = 29). The most frequent symptoms were fever, vomiting, lethargy and headache. As serious symptom as acute flaccid paralysis was present, which is topical problem worldwide since 2014, reaching increased numbers last year 2018 in US and Europe and believed to be caused by enteroviruses.

## BODY SIZE PERCEPTION IN RELATION TO BODY MASS INDEX (PILOT STUDY OF SCHOOLCHILDREN FROM VILNIUS, LITHUANIA)

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**Keywords.** Body size perception, BMI, pre-adolescence.

**Objectives.** Body image ideals are widely spread via different mass media tools and might affect more and more younger children. However, it is not clear at which age body size starts to be important. The aim of present study was to investigate body size perception in relation to body mass index (BMI) at pre-adolescence.

**Materials and methods.** 107 children (55 girls and 52 boys), aged 9-11 years old, completed Children Body Image Scale (CBIS) (H. Truby, S. Paxton, 2002), where 1st figurine represents BMI below 3rd %, and 7th figurine – over 90th %. Height and weight was measured, BMI was evaluated using IOTF values (T.J. Cole et al., 2000; 2007). Data were processed using Excel and SPSS 22.0.

**Results.** Answering the question 'How do you think you look like?', average figurine chosen by girls was number  $2.7 \pm 1.18$ , and by boys –  $2.38 \pm 0.99$  ( $p > 0.05$ ). There was a positive correlation between BMI and chosen figurine:  $r = 0.696$  ( $p < 0.01$ ) for girls, and  $r = 0.636$  ( $p < 0.01$ ) for boys. Answering the question 'How would you like to look like?', average figurine was thinner ( $p < 0.05$ ): girls picked number  $2.01 \pm 0.87$  and boys –  $2.09 \pm 0.82$ . Within BMI groups, 25% of underweight girls chose thinner, while 40% of thin boys picked larger desired figure. Within normal BMI group, 42.5% of girls and only 16.1% of boys chose thinner desired figurine ( $p < 0.01$ ), while almost all overweight children wanted to be thinner. There was a significant negative correlation between BMI and desired figure:  $r = -0.443$  ( $p < 0.01$ ) for girls and  $r = -0.726$  ( $p < 0.01$ ) for boys.

**Conclusions.** Perception of real body size was related to real BMI of 9-11-year-old children, besides, an increasing BMI was interrelated to thinner desired figure.

## PARENTAL ATTITUDES TOWARDS VACCINE-PREVENTABLE DISEASES

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**Keywords.** Vaccination, vaccine-preventable diseases, parental attitude

**Objectives.** Although vaccination is available for every child, there are still cases of vaccine-preventable diseases in Latvia with severe complications, it begs to question, why parents still choose not to vaccinate their children. The purpose of this study was to determinate parent assessment of vaccine-preventable disease severity and to evaluate differences of severity assessment depending on the child's vaccination status.

**Materials and methods.** An anonymous survey of parents whose children are younger than 7 years was conducted. Data was collected by questionnaires in 6 kindergartens during December 2018 as well as on the internet site [www.facebook.com](http://www.facebook.com) in January 2019. Parents were asked to evaluate severity of 11 vaccine-preventable diseases in a scale from 0 to 10 (10 being the most severe).

**Results.** 1084 parents participated in survey, 93 parents in kindergartens (Group-1) and 991 in Facebook (Group-2). In group-1 87% of parents vaccinated, 10% partially vaccinated and 3% did not vaccinate their children. In group-2 79% of parents vaccinated, 14% vaccinated partially and 7% did not vaccinate their children. In both groups vaccinated kids' parents evaluated diseases more severely than in not vaccinated group, by giving diphtheria - 8.71, tetanus - 8.81, chickenpox - 6.54, influenza - 7.29, rota virus - 6.65, tuberculosis - 8.89 points. Nonvaccinating parents gave diphtheria - 6.51, tetanus - 6.80, chickenpox - 2.88, influenza - 3.68, rota virus - 2.98, tuberculosis - 5.91 points.

**Conclusions.** Parents who do not vaccinate children assessed the diseases as potentially less dangerous than those who vaccinate their children. Overall parents consider chickenpox to be the mildest disease, then rota virus and influenza, but most severe - tetanus, tuberculosis and diphtheria. Parents who do not vaccinate their children are more active on the internet and express their opinion more than parents in kindergartens.

## THE RELATIONSHIP BETWEEN BODY IMAGE AND SELF-ESTEEM IN 9-11-YEAR-OLD CHILDREN (PILOT STUDY OF SCHOOLCHILDREN FROM VILNIUS, LITHUANIA)

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**Keywords.** Body-esteem, self-esteem, pre-adolescent children.

**Objectives.** Body image is important component of individual's self-concept that leads to healthier mental state. However, it is not exactly clear how body image and self-esteem concerns are related at preadolescence. The aim of present study was to determine the relationship between body image (body size, shape, general appearance) and self-esteem in 9-11 years old children.

**Materials and methods.** In total, 107 children (55 girls and 52 boys), aged 9-11 years old, were investigated in 2018. Children completed a self-esteem questionnaire (M. Rosenberg, 1965), a 10-item scale that measures global self-worth, the minimum possible score is 0 and the highest is 30, higher scores indicate higher self-esteem. The body esteem scale (BES) (Mendelson & White, 2001) was used to assess body image. BES is a self-report measure designed to assess child's feelings related to body perception using yes/no responses to 20 items such as 'I wish I were thinner'. The minimum possible score is 0, the highest is 20, higher scores indicate higher body esteem. Data were processed using SPSS 22.0. Pearson's correlation was applied to assess the relation between body esteem and self-esteem. T-test was used to clarify a statistical significance between genders.

**Results.** Mean value of BES was  $14,28 \pm 5,59$  in girls and  $14,62 \pm 5,91$  in boys. The mean value of Rosenberg's self-esteem scale was  $22,71 \pm 4,52$  and  $21,6 \pm 5,92$  (respectively). There was no statistically significant difference in body perception and self-esteem and between genders. Significant positive strong correlation was seen between self-esteem and body-esteem both in girls ( $r = 0.647$ ,  $p < 0.01$ ) and boys ( $r = 0.739$ ,  $p < 0.01$ ).

**Conclusions.** This pilot study shows that dissatisfaction with body image and self-esteem are strongly interrelated items in 9-11-year-old children. Results emphasize an importance of preventing body image issues starting from an early age.

## HEALTH LITERACY STUDY OF PARENTS IN PEDIATRIC EMERGENCY DEPARTMENT

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**Keywords.** Health Literacy, pediatric, Lithuania.

**Objectives.** Health Literacy (HL) is defined as cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health. HL level of parents here have never been academically researched. The aim of this study is to assess parents' HL level in the pediatric emergency department (PED) in Lithuania.

**Materials and methods.** Anonymous survey has been carried out in order to perform a cross-sectional study. Research population was parents who visited tertiary-level teaching hospital PED in 8-23 March, 2018 (sample size = 210). HL was assessed with HLS-EU-Q16 and The Newest vital sign (NVS) questionnaires. The HL index (according to replies to HLS-EU-Q16 questionnaire) was categorized: Inadequate HL (0-25), Problematic HL (26-33), Sufficient HL (34-42), Excellent HL (43-50). Functional health literacy (NVS) was measured by asking six questions related to food nutritional fact label. Scoring ratings ranged from 0-6 points, which can be grouped into and adequate (5-6), possibility of limited literacy (3-4), limited literacy level (0-2). Statistical analysis was performed using R<sup>x</sup>64 3.1.1 and MS Excel 2013.

**Results.** 56% of parents have adequate literacy, 23% have the possibility of limited literacy, 19% limited literacy according NVS. 4% of parents have excellent HL, 33% sufficient, 56% problematic and 5% inadequate according HLS-EU-Q16 questionnaire. Parents with higher education have more adequate functional HL ( $r = 0.34$ ,  $p$ -value 0.0001). There was no significant association with limited functional health literacy and gender, age and body mass index.

**Conclusions.** A large proportion of parents have limited HL skills. The research revealed that parents with higher education have more adequate HL. The results underline the need for improved health education and applying adequate health communication techniques that would enhance understanding among parents with low HL.

## NEUTROPHIL TO LYMPHOCYTE RATIO AS A PROGNOSTIC VALUE FOR PAEDIATRIC BRAIN TUMOURS

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**Keywords.** Paediatrics, brain tumours.

**Objectives.** Primary central nervous system (CNS) tumours are the second most common malignancies in childhood and adolescence (Siegel R et al,2013). The overall mortality approaches 30% (Kliegman et al,2016). The role of systemic inflammatory response such as NLR, is a time efficient and an inexpensive marker. The aim of the study was to explore the role of NLR as a valid prognostic mark for patient outcome for paediatric primary brain tumours.

**Materials and methods.** Retrospective study included patients receiving surgery for primary brain tumours. We collected patient data using Andromeda database from December 2008–2018 at the Children's University Hospital, Riga. Patient discharge summaries, radiology reports and laboratory analysis (obtained pre-operatively) were used. Data was analysed using Excel and SPSS.

**Results.** The study composed of 46 patients (26 female, 20 males). The ages were ranging from 9 months to 18 years, at the time of operation. NLR was compared with the following patient information: invasion, grade, tumour types, if they received chemotherapy/radiotherapy or both and mortality(including hospice care). Statistically significant albeit rather weak correlation was found between the grade of the malignancy and NLR (Spearman's rho = 0.41, p = 0.008). Grade 3 tumour types were found to have the highest mean rank of NLR ratios (32.7). NLR was compared among patients with different tumour types, the difference has been found to be statistically significant (h = 14.081, df = 5, p = 0.015). Highest NLRs are for glioblastoma. NLR median value of 1.95 was used as a cut-off for dividing patients in high (n = 23) and low (n = 23) ratio groups. Of the patients in high NLR group, 57% (± 20.23) are placed in hospice care or died in the hospital until December 2018. 71% (± 18.54) of the patients who received both chemotherapy and radiotherapy had NLRs above the cut-off value.

**Conclusions.** NLR is a useful prognostic tool for paediatric primary brain tumours, however should be used holistically with other clinical and diagnostic data. It is also an indicator of tumour type, especially for glioblastomas.

## HEREDITARY PANCREATITIS – AS A CAUSE OF IDIOPATHIC PANCREATIC DISORDERS AMONG PEDIATRIC PATIENTS IN LATVIA

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**Keywords.** HP, PRSS1, SPINK1, CFTR, CTRC.

**Objectives.** Hereditary pancreatitis (HP) is rare disorder of the pancreas with prevalence 1:100,000. Pathogenic variants in PRSS1, SPINK1, CFTR and CTRC genes are identified in majority of HP cases. The aim of the work was to analyze the frequency of HP causing variants in pediatric patients with idiopathic pancreatic disorders.

**Materials and methods.** Study included 20 pediatric patient diagnosed with recurrent acute pancreatitis (RAP), idiopathic pancreatic insufficiency (IPI), idiopathic chronic pancreatitis (ICP) and idiopathic acute pancreatitis. Pathogenic variants p.R122H, p.N29I, p.A16V (PRSS1), p.N34S (SPINK1) and most common variants in CFTR gene were analysed in all patients. Five patients with most severe phenotype and three patients with only one recessive variant found were selected for analysis of PRSS1, SPINK1 and CTRC genes (performed by bidirectional sequencing for coding regions).

**Results.** Autosomal dominant HP (PRSS1 p.R122H) was confirmed in only one patient who suffered from ICP. One of the patients with RAP was found to have two variants in CTRC genes pathogenic p.R254W and risk variant p.Gly60 = . Another RAP patient was having pancreas divisum and was heterozygous for SPINK1 p.N34S variant – which could explain patients phenotype. Only one heterozygous SPINK1 p.N34S or CFTR p.R688C variant was found in two cases (with RAP and IPI respectively). Two variants of unknown significance in PRSS1 p.A134S and CTRC p.N213S with p.Gly60 = variant were found in two patient with RAP. No pathogenic variants were found in 13 patients.

**Conclusions.** 1. Sequencing of PRSS1, SPINK1 and CTRC genes coding sequence are resulting in higher diagnostic yield than analysing only most common variants in children with pancreatic disorders. 2. Although HP diagnosis was confirmed in only 1/20 patient, at least one genetic risk factor was found in 5/20 patients in study.

## PRETERM BIRTH AND BREASTFEEDING IN LATVIA: SUCCESSES AND FAILURES

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**Keywords.** Breastfeeding, preterm infant.

**Objectives.** Approximately 10% children worldwide are born prematurely every year. For preterm infants breastmilk plays an important role in their development, but they encounter a number of barriers to breastfeeding. The aim is to examine factors that may face mothers of preterm infants when starting to feed at breast and its impact on the result.

**Materials and methods.** Women (n = 79) with preterm infants (< 34 gestational week, n = 84) were interviewed at Children's Clinical University hospital and Vidzeme hospital follow-up programme during six-month period in 2018 about failures and successes when starting to feed at breast.

**Results.** 61,9% infants were fed at breast, 53,8% of them were born moderately preterm, 38,5% very preterm. Only 40,4% infants were breastfed later. There was significant negative correlation between mother's age and child's gestational age (p = 0,03). 98% mothers who begun to feed at breast, during pregnancy were confident that will breastfeed and 60% of them have received enough information before. 54,2% of women who started to breastfeed as success mentioned medical stuff training, 29,2% family support and 43,8% mentioned their own answers, like self-belief, previous experience. There was significant association between breastfeeding and mother's confidence that she will breastfeed (p = 0,01). Infants who weren't breastfed in 37,9% were born very preterm and 37,9% moderately preterm. 50% women who did not begin to breastfeed have not received enough information about breastfeeding, 17,2% of them during pregnancy were not confident that will breastfeed. 38,7% of women as failure stated infant inability to suckle, 22,6% thought they have no milk.

**Conclusions.** Most of women begun to breastfeed, but less than half continued later. Women do not receive enough family support. Whether infant was born very preterm or moderately preterm, he could be breastfed equally successful. Women need to be better educated about breastfeeding of preterm infant.

## CRP AS A PREDICTOR FOR PROLONGED HOSPITALIZATION TIME OF TERM NEONATES AFTER SPONTANEOUS VAGINAL DELIVERY

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**Keywords.** Early neonatal sepsis, C-reactive protein, spontaneous vaginal delivery, term neonates

**Objectives.** Length of postnatal hospitalization is a parameter showing effectiveness of managing both intra-partum and post-partum periods. Several tests are usually done to evaluate neonatal well-being and predict complications. CRP is one of them, believed to be a parameter showing probable presence of infection or other diseases, that demand appropriate therapy and prolonged hospitalization of a newborn.

**Materials and methods.** From January till February 2018 retrospective study was performed by analyzing medical records of 1121 women, who had spontaneous vaginal delivery (SVD) in Riga Maternity hospital from January till December year 2017. CRP levels were analyzed, grouping them according to reference value of 0,33 mg/dL, in relation to neonatal hospitalization time and prevalence of received treatment. Data processing was done with MS Excel and SPSS v21.0.

**Results.** CRP level was measured for 712 newborns (63,5%). For 34,97% (n = 392) of neonates whose CRP was not detected, average hospitalization length was 2,68 (SD+0,87) days. For 37,60% (n = 422) neonates, whose CRP was less than 0,33 mg/dL - 2,93 (SD+0,97) days. For 27,48% (n = 308) neonates, whose CRP level was more than 0,33 mg/dL - 3,44 (SD+1,57) (p < 0,001). From total n = 712, whose CRP level was measured, 14,75% (n = 105) received antibacterial treatment, 92,38% (n = 97) of them had CRO more than 0,33 mg/dL (p < 0,001).

**Conclusions.** CRP value more than 0,33 mg/dL could be used for prediction of prolonged neonatal stay in a hospital and in more than 92% of cases means necessity in antibacterial treatment.

## CLINICAL AND LABORATORY CHARACTERISTICS IN CHILDREN UNDER 18 YEARS OF AGE WITH A CONFIRMED DIAGNOSIS OF CELIAC DISEASE TREATED AT THE CHILDREN'S CLINICAL UNIVERSITY HOSPITAL FROM 2008 TO 2018

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**Keywords.** Celiac disease, children, clinical presentation, HLA.

**Objectives.** Celiac disease (CD) is an autoimmune enteropathy in which small intestinal mucosa is damaged by an immune-mediated response to dietary gluten in genetically predisposed individuals with positive HLA-DQ2/DQ8. The aim is to evaluate the prevalence of the HLA-DQ2/DQ8 genes as well as to find out and analyse related clinical and laboratory characteristics along with other conditions associated with confirmed CD.

**Materials and methods.** Data was compiled retrospectively from 1011 ambulatory cards and electronic medical records of patients aged 0-18 years with newly diagnosed CD, admitted at the Children's Clinical University Hospital (2008-2018). We included 132 patients with Marsh 3 lesion and positive/unknown genetic background. The analysis was performed using MS Excel 2015 and IBM SPSS Statistics 22 software.

**Results.** The majority of 132 patients were females (59,1%). Age ranged from 10 months to 17 years (mean  $\pm$  SD: 6,33  $\pm$  3,57 years). The most frequent gastrointestinal features were abdominal pain (63,6%), bloating (31,1%), diarrhea (27,3%) and extraintestinal - weight deficiency (16,7%), anaemia (15,9%), headache (6,1%). Type 1 diabetes mellitus (5,3%) was the leading autoimmune-associated condition, followed by hypothyroidism (4,5%) and IgA deficiency (1,5%). Down syndrome - 0,8% of patients. Positive family history was present in 7,6% (n = 10). HLA-DQ gene analysis was performed in 87 patients. HLA-DQ 2.5 was the most common (78.2%), followed by DQ2.2 (31.0%) and DQ8 (26.4%). 9.2% of patients were both HLA-DQ2/DQ8 positive.

**Conclusions.** The study demonstrates clinical presentation diversity of paediatric celiac disease. HLA-DQ2.5 distribution is more frequent than that of HLA-DQ8. Abdominal pain is the most common symptom for all haplotypes, but it is not statistically significant.

## THE EFFECT OF PRENATAL FACTORS ON THE COURSE OF BRONCHOPULMONARY DYSPLASIA: A SINGLE-CENTRE RETROSPECTIVE STUDY

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**Keywords.** Bronchopulmonary dysplasia, prenatal factors, risk factors.

**Objectives.** Bronchopulmonary dysplasia(BPD) is a common complication of very premature birth newborns. Study is made to review maternal factors and pregnancy complications and its relationship with therapy strategies of BPD in a neonatal intensive care unit(ICU).

**Methods.** A retrospective study was made including 100 alive patients (54 male; 46 female) who were treated in Children's Clinical University Hospital of Latvia and were diagnosed with BPD from January 2013 to December 2017. Data was collected through a review of medical records of these newborns admitted to a neonatal ICU. Data was analyzed with SPSS using Mann-Whitney-test and Chi-square-test.

**Results.** Eighty six(86%) patients were born between 24th and < 28th gestational week, 13(13%) patients between 28th and < 32nd and 1(1%) between 32nd and < 34th gestational week. 69(69%) patients weighed less than 1000g, 29(29%) patients between 1000 to 1499g, 1(1%) patient between 1500 to 2499g and one(1%) more than 2500g. Patients whose mothers were older than 35y(20%) at the time of delivery had higher necessity (hours) of high frequency ventilation ( $198 \pm 57SE$ ,  $89 \pm 24SE$ ;  $p = 0.032$ ). Placenta-mediated pregnancy complications (21%) has showed higher risk for primary reanimation of newborn ( $\chi^2(1, n = 99) = 7.78$ ,  $p = 0.009$ ,  $\phi_c = 0.280$ ) which furthermore has higher risk of developing sepsis ( $\chi^2(1, n = 100) = 4.14$ ,  $p = 0.042$ ,  $\phi_c = 0.203$ ) therefore impacting treatment dramatically by increasing necessity of surfactant ( $p = 0.002$ ), invasive ventilation ( $p < 0.001$ ), dexamethasone use ( $p = 0.021$ ) and length of stay in ICU( $p = 0.009$ ). Patients whose mothers were smoking (8%) during pregnancy have higher frequency of surfactant use( $p = 0.021$ ) and higher necessity of CPAP use( $p = 0.014$ ).

**Conclusions.** BPD occurrence is more likely for extremely premature newborns with very low and extremely low birth weight. Prenatal risk factors for more severe course of BPD are mothers age being more than 35 years, placental complications which increases risk for sepsis, and smoking during pregnancy.

## MATERNAL KNOWLEDGE ABOUT SUDDEN INFANT DEATH SYNDROME AND ITS RISK FACTORS

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**Keywords.** Sudden death, risk factors, newborn.

**Objectives.** Sudden infant death syndrome (SIDS) is one of the leading causes of infant mortality. According to the data from the Disease Prevention and Control Centre of Latvia, SIDS occurred in 3 cases per 10'000 live births in 2017. Reduction of the risk factors plays a key role in prevention of SIDS. The aim of this study was to determine the maternal knowledge about SIDS and its risk factors.

**Materials and methods.** In this cross-sectional study, a total of 101 mothers of newborns were enrolled. The study was performed in Riga Maternity Hospital from November to December 2018. All data were collected by questionnaire, summarised using MS Excel and analysed with SPSS 20. Chi-square and Fisher's Exact test were used to determine statistically significant associations.

**Results.** The mean age of 97 enrolled women was 31 years (range 21 to 46 years), 64.4% (n = 65) had a higher education degree. Overall, 75.2% (n = 76) answered, that they are informed about SIDS and its risk factors, 32.7% (n = 33) claimed their knowledge as sufficient. During the pregnancy, 2% (n = 2) used tobacco, 30.7% (n = 31) were second-hand smokers, 5% (n = 5) had used alcohol. All pregnancies were supervised, 98% (n = 99) of mothers breastfeed their child. Of all respondents, 71.3% (n = 72) were planning to put additional objects in newborns' sleeping place, 13.9% (n = 14) chose to use a soft mattress for the bed and 18.8% (n = 19) planned to dress newborn warmly for sleep. Only 2.9% (n = 3) of respondents planned a single room with a separate bed for their child, 4.9% (n = 5) admitted, that the newborn will sleep in the same bed with parents, but 96% (96/100) chose a side or prone sleeping position for their newborn.

**Conclusions.** Most of the respondents reply to be informed about SIDS and its risk factors. However, certain risk factors are commonly noticed in this study.

## MANAGEMENT OF NEONATAL ASPIRATION OF MECONIUM IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Meconium aspiration syndrome, neonate, antibacterial treatment

**Objectives.** Meconium aspiration syndrome (MAS) is one of the main causes of respiratory distress syndrome in newborns. MAS results from aspiration of meconium during intrauterine gasping or during the first few breaths. Studies show that about one-third of neonates with MAS require intubation and mechanical ventilation. Until now there has been no data about MAS treatment in Latvia. The aim is to analyze management of MAS patients in Neonatal intensive care unit (NICU).

**Materials and methods.** A retrospective study using medical history data from patients with medical diagnosis neonatal aspiration of meconium (P24.0-ICD-10) in Children's Clinical University hospital NICU during 2008–2018.

**Results.** 2008–2018 there were 88 patients in NICU with diagnosis Neonatal aspiration of meconium. 64% (n = 56) were girls and 36% – boys (n = 32). 70% (n = 62) of cases after birth reanimation algorithms were used. 31% (n = 19) required immediate intubation, 70% (n = 61) were intubated in first three hours of life. Respiratory support was required in 86% (n = 76). 20% (n = 15) required high frequency oscillatory ventilation. Mechanical pulmonary ventilation was required in 47% (n = 36). In other cases CPAP or oxygen mask was used. The first-choice antibacterial agent was Ampicillin – 67% (n = 59). In 58% (n = 51) in combination with Gentamicin. Second most commonly used antibacterial agents – Cefotaxime 20% (n = 18), Penicillin 19% (n = 17). Third-choice antibacterial agent – Vancomycin – 7% (n = 6). The most frequent secondary diagnosis of MAS was asphyxia in labor 22% (n = 19), perinatal fetal hypoxia 18% (n = 16) and early neonatal sepsis 11% (n = 10).

**Conclusions.** Corellating with literature data, more than two thirds (86%) of MAS patients needed respiratory support. First-choice antibacterial agent for these patients is Ampicillin combined with Gentamicin.

## COMPARING CHILDREN AND THEIR PARENTS' OPINION ABOUT QUALITY OF LIFE IN HEALTY CHILDREN ACCORDING TO KIDSCREEN QUESTIONNAIRE IN LATVIA

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**Keywords.** Health-related quality of life, HRQoL, schoolchildren

**Objectives.** In a prophylactic visit, it is important not only to gather objective information about a schoolchild's well-being but also to analyse their attitude towards their health, as well as their parents' belief. Despite the access to surveys, there aren't many studies about children's quality of life in Latvia. The objective of the study was to analyse schoolchildren's health and well-being comparing to their parent answers (health-related quality of life, HRQoL).

**Materials and methods.** 100 healthy children aged 8 to 17 years old and their parents were enrolled into the study at general paediatrician's practice. Participants voluntarily and randomly were surveyed by a KIDSCREEN-52 questionnaire (Ravens-Sieberer U. et al., 2005, The KIDSCREEN Group Europe, 2006). The questionnaire includes 10 HRQoL dimensions such as physical and psychological well-being. Survey answers were divided into two groups: Children group and Parent group. SPSS Statistics 22 was used for the statistical analysis of data. Statistical analysis was performed using Spearman correlation (rs) coefficient for correlation analysis. Statistical significance level was set at  $p < 0.05$ .

**Results.** The mean age of the patients was 14,5. There was a significant correlation between patients' and their parents' opinions on their general health ( $rs = 0.46$ ,  $p < 0.001$ ), being fit and healthy ( $rs = 0.45$ ,  $p < 0.001$ ) and being full of energy ( $rs = 0.43$ ,  $p < 0.001$ ), as well as being physically active ( $rs = 0.43$ ,  $p < 0.001$ ).

**Conclusions.** Correlation was found between patients' and their parents' opinions on their general health and physical activities. This shows a tendency that parents' and their children's views are similar. However, a more extensive study would be needed on the population to confirm this finding.

## RECOGNITION OF ALARMING SIGNS OF SERIOUS ILLNESS IN CHILDREN WITH FEVER IN PHARMACY PRACTICE

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**Keywords.** Fever, pharmacist observations, paediatrics.

**Objectives.** Fever in children is one of the most common reasons for seeking medical help. Pharmacist is frequently the first reliable source of information for parents. It is critical pharmacists are competent to reliably recognize alarming signs of a serious illness for children with fever. The aim was to investigate the competency of pharmacists to recognize alarming signs in children with fever in real-life setting.

**Materials and methods.** This prospective observational study was conducted performing a simulated scenario of pharmacist–customer consultation for 5 high risk signs for a child of 6 months with fever that indicated a necessity for emergency medical attention. We conducted 38 interviews in randomly selected pharmacies. The signs were communicated in sequential order and results were scored based on how many signs had to be presented by the parent to receive a recommendation emergency help. (max = 5, min = 0). SPSS v23.0 was used to analyse the data.

**Results.** 17 pharmacies (45%) were located in central Riga, 21(55%) were in suburbs. Three alarming signs had to be indicated in order to receive a recommendation for seeking medical advice i.e., the median of an acquired sum of points was 2(IQR2). In 95% of cases pharmacotherapy, but in 5% no medication was recommended. In 68% of cases two, but in 16% three or more medications were recommended. In 92% of cases medical care was recommended – in 76%-emergency medical care and in 16%-care within 24 hours. In 8% of cases pharmacists did not refer for medical advice at all.

This score was not statistically related with other variables- location, time of simulation, gender of the client and level of consultant (pharmacist or assistant).

**Conclusion.** Findings demonstrate the need to train pharmacists to recognize alarming signs of serious illness in children with fever. Guidelines for fever in children should also target pharmacists.

## POSTPARTUM DEPRESSION IN THE NEONATAL INTENSIVE CARE UNIT

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**Keywords.** Mothers, postpartum depression (PPD), neonatal intensive care unit (NICU)

**Objectives.** Postpartum depression affects about 10% – 15% of all new mothers. At the same time, mothers of infants in NICU experience PPD at higher rates than mothers of healthy infants. Possible risk factors include complications in partnership, lack of support and financial troubles. The aim of the study is to review postpartum depression possible risk factors and incidence between mothers in the Neonatal intensive care unit at Children's Clinical University Hospital.

**Materials and methods.** The cross-sectional study included 69 women in the postpartum period in the Neonatal intensive care unit at Children's Clinical University Hospital. Data were collected from March 2018 until September 2018, using an anonymous survey based on Edinburgh Postnatal Depression scale with additional questions about marital status, newborn's gestational age, financial status, support during pregnancy and postpartum and others. The obtained data were analyzed using MS Excel and IBM SPSS Statistics v24.

**Results.** The mean age of participated mothers was  $30,66 \pm 5,7$  years old, minimal age was 17 years old and maximal age was 45 years old. Mean gestational age was  $34,81 \pm 4,5$  weeks, minimal age was 27 weeks, maximal age was 42 weeks. Support during pregnancy had a significant impact on woman mental health ( $p = 0,025$ ), however, support postpartum had no significant association with causing PPD ( $p = 0,428$ ). No significant association was also found between marital status ( $p = 0,096$ ), number of pregnancies ( $p = 0,213$ ), number of deliveries ( $p = 0,819$ ), gestational age ( $p = 0,710$ ), course of pregnancy ( $p = 0,733$ ), course of delivery ( $p = 0,891$ ), financial status ( $p = 0,428$ ) and PPD. 50,7% of participated mothers gained 10 and more points in questionnaire, which can indicate a possible depression.

**Conclusions.** Insufficient support during pregnancy has a significant impact on mother's mental health. About half of the mothers in NICU are susceptible to postpartum depression.

## IMPORTANCE OF CLINICAL SIGNS AND CLINICIANS'S GUT FEELING IN IDENTIFYING SERIOUS BACTERIAL INFECTIONS IN CHILDREN WITH FEVER AT EMERGENCY DEPARTMENT

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**Keywords.** Serious bacterial infections, fever, gut feeling.

**Objectives.** Five to 15% of febrile children presenting to ED may have serious bacterial infections, which must be diagnosed and treated early. The aim of the study is to assess the performance of clinical signs at presentation and clinician's gut feeling for early recognition of serious bacterial infections (SBI) in children with fever presenting to ED.

**Materials and methods.** This prospective observational study included children (0-18 years) who presented to the emergency department of Children's Clinical University Hospital with fever between October 2017 and May 2018. Clinician's gut feeling, defined as intuitive feeling that the patient has a serious illness, was assessed via questionnaire, which was filled before the investigation results became available. The clinical signs at presentation were noted in a standardized case report form. SBI was defined as bacterial meningitis, pneumonia, acute pyelonephritis, osteomyelitis, bacterial gastroenteritis, appendicitis, severe skin and soft tissue infections, bacteraemia and sepsis. Data analysis was carried out using MS Excel, SPSS statistical analysis platform.

**Results.** The study included 261 patients aged 1 months to 17 years and 10 months, (median 4 years 10 months). 87 (33,3%) patients were diagnosed with SBI. Gut feeling was evaluated in 247 cases, 119 (48.2%) of patients were assessed by licenced paediatricians, 128 (51.8%) by paediatric residents). Clinical features associated with developing SBI (Odd's Ratio > 2, p < 0.05) were ill appearance, inconsolable crying, tachypnoea, abnormal or reduced breathing sounds, shortness of breath, use of accessory breathing muscles, and poor peripheral circulation. Gut feeling when expressed by licenced paediatricians (positive likelihood ratio (LR+) = 6.0, 95% confidence interval (CI) = 2.8-12.9) but not by paediatric residents (LR+ = 2.5; 95%CI = 1.6-4.4) was significantly predictive of SBI.

**Conclusions.** Clinical features associated with SBI were similar to those identified in other studies. Gut feeling of serious illness was predictive of SBI when expressed by experienced clinicians.

## CLINICAL CHARACTERISTICS OF GLOMERULONEPHRITIS IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL: 10 YEAR'S DATA ANALYSIS.

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**Keywords.** Glomerulonephritis, children.

**Objectives.** Glomerulonephritis is a serious clinical situation for every pediatrician which can lead till end stage kidney disease. In the literature, post-streptococcal glomerulonephritis is mentioned as the most common type of glomerulonephritis in children. Biopsy data shows minimal change glomerulonephritis as the most common. According to research in Estonia-IgA nephropathy is the most common glomerulonephritis in adult population. There is no available data about the most common type in children population in Latvia. The aim of the study is to find out the most common type of glomerulonephritis in children population in Latvia and their clinical characteristics.

**Materials and methods.** This is a retrospective descriptive study. Data is from Department of Nephrology of the Children's Clinical University Hospital. Patients under 18 years of age with diagnosis N00-N08 (glomerular disease by ICD-10), hospitalized from January 1, 2007 to December 31, 2016 were selected. Patient information about hospitalization time, age, gender, laboratorial findings, diagnosis based on clinical signs and symptoms and kidney biopsy answers were collected. Data was analyzed with SPSS program.

**Results.** Study included 225 patients (60% women). The youngest patient was 1 month old, mean age- 9 years. 41% had nephrotic syndrome and 40% nephritic syndrome, 15% had isolated hematuria, 1% isolated proteinuria and 3%-mixed syndrome. The most common type was postsreptococcal glomerulonephritis (66%). Only 12% of the patients had biopsy answer. From biopsy data mesangioproliferative glomerulonephritis was the most common leaving minimal change disease glomerulonephritis as the third. Mean serum creatinine was 54 µmol/l (max-970 µmol/l), mean urea- 5,9 mmol/l.

**Conclusions.** Nephrology department of the Children's Clinical University Hospital is the main department for children with kidney diseases in Latvia. The study approximately represents the national situation. More study should be done to gather all cases.

## RISK FACTORS FOR HIGH GRADE INTRAVENTRICULAR HAEMORRHAGE IN PREMATURE INFANTS

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**Keywords.** Intraventricular haemorrhage, premature, risk factors

**Objectives.** New-born intraventricular haemorrhage (IVH) is a form of a brain injury occurring around 20–25% of all premature neonates with very low birthweight. Because of the destruction of the immature cerebral region and deformity impact on the white matter due to direct damage, increased intracerebral pressure and oxidative stress, this condition may lead to an increased risk of further neurological disorders and brain development impairment. Several studies have been done to determine the pathophysiological development of IVH, but it is still unclear what exact underlying mechanisms cause spontaneous haemorrhage. The aim is to identify risk factors for high grade (III, IV) IVH in premature neonates (< 34 weeks of gestation).

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

**Results.** In 5-year period 109 (male n = 65; 60%, female n = 44; 40%) premature infants had a high grade (III, IV) IVH. Patient groups were based on IVH grade. 88 patients had III grade IVH with mean gestational age and birth weight  $27,6 \pm 2,5$  weeks and  $1173,0 \pm 400,5$  g. 15 patients had III/IV grade with mean gestational age and birth weight  $27,1 \pm 2,5$  weeks and  $1089,7 \pm 452,8$  g. 6 patients had IV grade with mean gestational age and birth weight  $25,7 \pm 2,8$  weeks and  $984,3 \pm 418,7$  g. Negative correlation was observed for gestational age ( $P = 0,004$ ). Also, negative correlations were observed for 1-min Apgar score ( $4,4 \pm 2,2$  vs.  $2,9 \pm 1,8$  vs.  $4 \pm 1,0$ ;  $P = 0,026$ ) and 5-min Apgar score ( $5,8 \pm 1,7$  vs.  $4,7 \pm 1,7$  vs.  $5,3 \pm 1,2$ ;  $P = 0,038$ ). For other risk factors (Caesarean section, neonatal resuscitation and use of antenatal steroid therapy) associations were observed, but they were not statistically significant.

**Conclusions.** Lower gestational age as a risk factor is associated with the development of a higher grade of IVH. Reduced Apgar score correlates with increased IVH grade.

## GYNAECOLOGY AND OBSTETRICS

### ABNORMAL UTERINE BLEEDING ACCORDING TO FIGO CLASSIFICATION IN NONGRAVID WOMEN OF REPRODUCTIVE AGE IN RIGAS EASTERN CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Gynaecology, abnormal uterine bleeding.

**Objectives.** Abnormal uterine bleeding (AUB) is one of the most common gynaecological problems. About 14-25% of the women can have AUB their lifetime. "The International Federation of Gynecology and Obstetrics Menstrual Disorders Group " were developed a new classification system PALM-COEIN, based on the aetiology of AUB. Despite the fact, that PALM-COEIN classification is available since 2011, AUB has never been investigated in Latvian population. The aim of the study was to actualize PALM-COEIN classification, to estimate the most frequent cause of abnormal uterine bleeding, to compare the clinical diagnosis with the final diagnosis.

**Materials and methods.** There were analyzed 60 nongravid reproductive age women with abnormal uterine bleeding, who were hospitalized in Gynecologic Clinic of Riga Eastern Clinical University Hospital. Women are categorized by abnormal uterine bleeding aetiology of FIGO classification.

**Results.** The final diagnosis were endometrial polyps 30.0% (21), submucosal leiomyomas 20.0% (14), endometrial hyperplasia 21.4% (15), leiomyomas 15.7% (11), adenomyosis 2.9% (2) and other 5.6% (4). The clinical diagnosis were metrorrhagia 22.1% (19), endometrial polyps 18.6% (16), leiomyomas 16.3% (14), submucosal leiomyomas 15.1% (13) and endometrial hyperplasia 15.1% (13) and other 11.8% (10). The coincided diagnosis between clinical and final diagnosis were endometrial polyp - 11 cases, leiomyoma submucosal - 8, leiomyoma - 8, endometrial hyperplasia - 8 and other - 1.

**Conclusion.** We can conclude, that the most common AUB causes were endometrial polyps, submucosal leiomyomas, endometrial hyperplasia and leiomyomas that coincide to the FIGO classification. The clinical diagnosis often coincides with a histological finding that confirming the need for endometrial biopsy in case of AUB. Only patients with structural endometrial damage are included in the study, but functional endometrial disorders should also be investigated. The study should be investigated further to include a greater number of study groups.

## ASSOCIATION BETWEEN VAGINAL DELIVERY AND URINATION PROBLEMS AMONG POSTPARTUM WOMEN

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**Keywords.** Vaginal delivery, urination problems.

**Objectives.** Women often experience urination problems after vaginal delivery. It is possible that these changes are a result of a pregnancy itself or they are caused by the way of delivery (cesarean section or vaginal delivery). The aim of this study was to evaluate impact of vaginal delivery on women' urogynaecological problems.

**Materials and methods.** A descriptive cross sectional study was performed in Riga Maternity hospital. 414 women with at least one previous vaginal birth were interviewed by using a questionnaire. Additionally, an online survey was created. The questionnaire was used to collect data about the quality of life after vaginal delivery related to urinary tract changes. Data was analyzed with SPSS program.

**Results.** 78 (18.8%) age 18-25, 165 (39.9%) age 26-30, 123 (29.7%) age 31-35, 48 (11.6%) age over 35. 102 (24.6%) complained about pain and burning during urination after vaginal delivery, 58 (14%) felt pain and burning at times. 85 (20.5%) reported urinary incontinence after vaginal delivery which in most cases lasted for several months 69 (50%) and 32 (23.2%) urinary incontinence often occurs when carrying out physical activities. 62.4% of women with urinary incontinence did not discuss their problems with gynaecologist. It was determined that urinary incontinence significantly correlates with changes in sex life after delivery ( $p = 0.003$ ) and as well as with the time period since the last pregnancy ( $p = 0.042$ ). There was statistically significant correlation between discomfort and pain during intercourse and urinary incontinence, as well as pain and burning during urination ( $p = 0.001$ ,  $p = 0.000$ ).

**Conclusion.** Results of our study imply that vaginal birth is associated with urination problems and impact women's life quality and sexual function. But despite these problems, most of the women did not discuss their problems with gynaecologist.

## BREASTFEEDING AFTER CAESAREAN SECTION – AWARENESS OF A POSSIBLE PROBLEM

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**Keywords.** Caesarean section(c-section), breastfeeding.

**Objectives.** According to the latest data the c-section rate in Latvia is 22.7%, that still exceeds the level recommended by the WHO(10-15%). According to the literature, women after c-section have more complains associated with breastfeeding than women after vaginal delivery. The aim of the study was to find out if c-section makes a potential difficulty in breastfeeding during time spent in hospital.

**Materials and methods.** A cross-sectional survey was conducted. Structured questionnaires were used to collect data. Data was analyzed using SPSS 23.

**Results.** 128 postpartum patients of the Riga Maternity Hospital between the ages of 20 and 43 years participated in this study. Patients were divided into 2 groups – control group (vaginal delivery(V) (n = 50) and research group (c-section, which was divided into planned(P) (n = 37) and emergency(E) (n = 41)). 56 (43.8%) were multiparous women, 72 (56.3%) were primiparous women. First breastfeeding initiation (FBI) was in 1h after childbirth in V58.0%, P24.3%, E14.6%. FBI was during first 6h V40.0%, P70.3%, E43.9%. FBI was after first 6h V2.0%, P5.4%, E41.5%. The difference between groups was highly significant ( $p < 0.01$ ). The difference between groups was not significant ( $p > 0.05$ ) in evaluation of the success of breastfeeding during time spent in hospital. There was significant ( $p < 0,05$ ) difference between groups in complains about too swollen breasts (V2.0%, P24.3%, E29.3%), change in nipple, (V12.0%, P29.7%, E31.7%), small amount of milk (V14,0%, P29,7%, E36,6%), tiredness (V8.0%, P8.1%, E24.4%). The difference between groups was not significant ( $p > 0.05$ ) in complaints about lower abdominal discomfort, breast and nipple pain, fear of unsuccess, child refuses to nurse.

**Conclusion.** Study suggests that c-sections are associated with latest breastfeeding initiation and more complains. C-sections doesn't affect evaluation of the success of breastfeeding during time spent in hospital. To assess c-section effect on breastfeeding, it is necessary to research the situation in long term.

## EVALUATING THE RISK AND RISK FACTORS OF PELVIC FLOOR DYSFUNCTION IN PRIMIPAROUS WOMEN IN THE POSTPARTUM PERIOD

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**Keywords.** Pelvic floor dysfunction, primiparous women, risk factors.

**Objectives.** Pelvic floor disorders (PFD) constitute a huge health problem that affects millions of women. The cause of PFD is known to be multifactorial. PFD can affect a woman's quality of life, therefore early identification remains a key element in the prevention. The aim of this study was to evaluate the risk to PFD in primiparous women after vaginal delivery and cesarean section.

**Materials and methods.** Cross-sectional study was conducted in Riga Maternity Hospital. 60 primiparous women in postpartum period were enrolled (age range 18-40 y.o). Patients filled out questionnaire, answers were analyzed using IBM SPSS Statistics 22. Risk was calculated using UR-CHOICE model. A p value of < 0.05 was considered significant. Association was calculated by Fisher's exact test and correlation by Pearson.

**Results.** Age M = 28.37; SD = 5.60 years, BMI M = 22.43; SD = 3.04 kg/m<sup>2</sup>. Primiparous women have an average risk of 4.53 % (95 %CI 3.86 - 5.20) to develop bothersome symptoms for pelvic organ prolapse; 12.68 % (95 %CI 11.21-14.15) urinary incontinence; 2.93 % (95 %CI 2.14-3.72) fecal incontinence; any of PFD 16.15 % (95 %CI 14.37-17.93) and >2 PFD 2.58 % (95 %CI 1.91-3.25) in next 20 years. 28.30 % of women smoked before pregnancy; none of them during pregnancy. 55 % had vaginal wall ruptures (VWR), 28.30 % had episiotomy. There was no statistically significant association between smoking before pregnancy (p = 0.09), vaginal wall rupture (p = 0.19), episiotomy (p = 0.44), steroid medication before pregnancy (p = 0.06) and the risk to develop any PFD. Family history(FH) of PFD takes a big role in development (p = 0,01). We found medium strong and positive correlation between BMI and the risk to develop any of PFD (r = 0.48, p = 0.01) and weak correlation between maternal age and development of PFD (r = 0.27, p = 0.03).

**Conclusion.** There was association between the risk of PFD and factors like maternal age, FM and raised BMI but the risk is not significant. RF like smoking, VWR, episiotomy, steroids didn't play a big role in development.

## EVALUATION IOTA LOGISTIC REGRESSION MODEL 2, IOTA SIMPLE RULES AND RMI IN THE PREOPERATIVE PREDICTION OF MALIGNANCY IN WOMEN WITH ADNEXAL MASSES IN LATVIA

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**Keywords.** Ovarian tumors, oncology-gynecology.

**Objectives.** In Latvia in some cases patients with benign ovarian tumors are sent to a specialized oncology-gynecology department for operative therapy and reversely – some patients with ovarian cancer are routinely operated in gynecological departments not in radical techniques, which later require repeated surgery. The aim of this study was to compare IOTA LR2, IOTA Simple Rules and RMI in predicting malignant ovarian tumor.

**Materials and methods.** This was a prospective study of women with an ultrasound diagnosis of an adnexal tumor. In all women the possibility of the adnexal mass being malignant was calculated using the IOTA LR2, IOTA Simple Rules and RMI protocols. All women underwent surgery and the ultrasound findings were compared with final histological diagnosis.

**Results.** The study included 35 patients with adnexal masses. 16 (45.7%) tumors were histologically diagnosed as malignant (including 6 borderline) and 19 (54.3%) tumors as benign. Sensitivity of IOTA LR2 for predicting malignant tumors 87.5% (95% CI 57 – 98%), IOTA Simple Rules 81.3% (95% CI 54 – 96%) was significantly higher than that of RMI 62.5% (95% CI 38 – 88%), but specificity of IOTA LR2 63.2% (95% CI 43 – 85%), IOTA Simple Rules 68.4% (95% CI 43 – 87) was relatively lower than that of RMI 73.7% (95% CI 46 – 88%).

**Conclusion.** The study shows that all protocols are applicable for use in ambulatory setting and should be used to select patients with adnexal masses for specialised oncology care in Latvia. Considering higher IOTA LR2 model sensitivity in predicting malignant adnexal tumours, it should be recommended as the protocol of choice. Considering relatively low specificity of all models the second stage test to reduce false positive findings should be created and introduced in future.

## HYPERTENSION-ASSOCIATED COMPLICATIONS AMONG PREGNANT WOMEN AFTER IN VITRO FERTILIZATION OR INTRACYTOPLASMIC SPERM INJECTION

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**Keywords.** Preeclampsia, PAPP-A, first trimester screening, aspirin.

**Objectives.** Preeclampsia (PE) usually presents with mild form, but can progress to severe and become life-threatening for both mother and fetus. The latest studies show, that low pregnancy associated plasma protein-A (PAPP-A), a marker used in 1st trimester genetic screening, is associated with high risk for PE developing. At the same time, the use of low doses of aspirin, starting from the 1st trimester, lowers the risk significantly. Our study was aimed to discover if adjusting PE risk during 1st trimester screening and subsequent use of aspirin lowers the PE prevalence during later course of pregnancy, and if pregnancy after in vitro fertilizations (IVF) or intracytoplasmic sperm injection (ICSI) has a higher risk for developing PE.

**Materials and methods.** A retrospective cohort study was conducted in Riga Maternity Hospital and "IVF Riga" Clinic. Patients were divided into three groups according to the method of conception, hypertensive disorders and if prophylaxis took place. Other possible risk factors, first trimester screening data and pregnancy outcome were also registered. Univariate data analysis was performed by using SPSS v22 software.

**Results.** Maternal age, parity, hypertensive disorders in medical history have no significant differences, however increased maternal BMI differs significantly ( $p = 0.023$ ). Method of conception has an impact on the developing of hypertensive disorders ( $p < 0.001$ ). Hypertensive disorders' prevalence between groups who received aspirin and who didn't differs significantly ( $p < 0.001$ ). First trimester screening data, including PAPP-A, do not differ statistically among the groups as well as further gestational diabetes developing and pregnancy outcome, including time, mode of delivery, weight of the newborn, Apgar score and developing of complication among mothers and children.

**Conclusion.** Mothers with obesity and after IVF have higher risk for developing of preeclampsia. Aspirin has proved its effectiveness in prophylaxis of hypertensive disorders during pregnancy.

## IMPACT OF ZONA PELLUCIDA AND WHOLE ENVELOPE'S THICKNESS TO OOCYTES FERTILIZATION

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**Keywords.** Zona pellucida thickness, infertility, in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), 2PN fertilization.

**Objectives.** Infertility is one of the most relevant health problems for young people around the world. Too thick zona pellucida is listed as one of the main reasons of failed oocytes fertilization. The aim of this study was to evaluate correlation between zona pellucida and whole oocytes envelope thickness and oocytes fertilization frequency, and to compare fertilization frequency among in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) methods.

**Materials and methods.** 1797 oocytes from 189 women undergoing to the IVF/ICSI treatment were enrolled in this study. Measurements of zona pellucida thickness and whole envelope thickness were made using NIS-Elements F software. 1210 oocytes were fertilized using IVF (117 women), for remaining 587 oocytes (72 women) ICSI was performed.

**Results.** Our analysis showed statistically significant difference in zona pellucida thickness among these two groups: thickness in IVF group was  $10.73 \pm 0.58\mu\text{m}$  and in ICSI group was  $10.84 \pm 0.63\mu\text{m}$  ( $P < 0.05$ ). However, there were no significant differences in whole oocytes envelope's thickness between these groups. Moreover, after IVF zona pellucida in non-fertilized oocytes was thicker than in normal fertilized (2PN): in non-fertilized oocytes zona pellucida thickness was  $11.08 \pm 0.69\mu\text{m}$  and in normal fertilized oocytes it was  $10.62 \pm 0.50\mu\text{m}$  ( $P < 0.05$ ). Fisher's exact probability test showed significant differences in 2PN fertilization ratio between patients in IVF (68.4%) and ICSI (76.1%) groups ( $P < 0.05$ ).

**Conclusion.** Our findings showed that oocytes with thicker zona pellucida fails to fertilize more often compared with oocytes with thinner zona pellucida.

## INFLUENZA COMPLICATION RATES IN PREGNANT AND NON-PREGNANT WOMEN

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**Keywords.** Influenza, pregnancy, complications.

**Objectives.** The immune system is modulated during pregnancy, and susceptibility to infectious diseases increases. The aim of the study is to evaluate if patients with flu while pregnant have a higher risk for developing flu complications.

**Materials and methods.** Current retrospective study was conducted at Riga East University hospital Latvian Centre of Infectious Diseases. Two patient groups diagnosed with flu were included – pregnant patients and non-pregnant women as a control group. 155 medical histories were analyzed covering data from 2016 to 2018. IBM SPSS Statistics 22 was used to analyze the data. Statistical significance level was set at  $p < 0.05$ .

**Results.** Study group consisted of 112 patients with mean age  $M = 28.9$ ;  $SD = 4.6$  years, average gestation week was  $21.8$ ;  $SD = 9.5$ . Control group included 43 non-pregnant women with average age  $M = 33.6$ ;  $SD = 7.1$ . Epidemiological data showed that 40.2% ( $n = 45$ ) of the study group and 34.9% ( $n = 15$ ) of the control group had positive family history. Positive work anamnesis was seen in 10.7% ( $n = 12$ ) of the study group and in 1 patient in the control group. Two patients (3.6%) were vaccinated against the flu, both pregnant. No significant difference was found in hospital stay ( $p = 0.65$ ) between the groups ( $M = 3.1$  days;  $SD = 1.4$  in study group,  $M = 3.0$ ;  $SD = 1.4$  in the control group), as well as between the rates of complications in both groups ( $p = 0.8$ ). There was a statistically significant association between pregnancy and acute rhinosinusitis ( $p = 0.015$ ). Pneumonia was diagnosed 9 times in pregnant and 2 times in control group. A statistically significant association was determined between pregnancy and less diagnostic tests at the hospital ( $p < 0.001$ ).

**Conclusion.** Pregnant women might not be more susceptible to developing complications from influenza overall, however, current study suggests that pregnant patients develop acute rhinosinusitis more frequently than non-pregnant women. Influenza type may not affect the rate of complications.

## INVESTIGATION OF THE PREGNANT WOMEN ATTITUDE TOWARDS FETUS BREECH PRESENTATION, EXTERNAL CEPHALIC VERSION AND OTHER BIRTH METHODS

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**Keywords.** Breech presentation, ECV, management, pregnancy.

**Objectives.** External cephalic version (ECV) procedure plays a big role during foetus breech presentation to take a chance for changing foetus position into cephalic and increasing ability of having a vaginal cephalic delivery. The successful implementation of this procedure reduces the need for caesarean delivery and improves the rates of vaginal delivery. I have noticed that external cephalic version is a rare topic both among pregnant women and in Lithuanian society. This creates a negative perception as a mysterious, frustrating and fearful procedure for many pregnant women in Lithuania. The aim of this study was to determine pregnant women approach to a choice of delivery method at foetus breech presentation and foetus headfirst presentation, their opinion about external cephalic version and its success and to compare the last opinion of subjects about external foetus version after having a consultation with the doctor.

**Materials and methods.** Questionnaire. The study included 150 pregnant women. 46 were nulliparous and 24 had had a caesarean delivery (CS) previously. The study carried out at the Department of Obstetrics and Gynaecology, Outpatient Unit, Lithuanian University of Health Sciences Kaunas Clinics. Data analysed, summarized and results compared by SPSS program.

**Results.** The majority of women 132 (88%) preferred vaginal delivery for an uncomplicated cephalic version. The main reasons was safety for foetus (33.3%) and a natural method of delivery (29.3%). Only 18 subjects (12%) preferred CS. Nine of 18 (6%) think it is less painful and five (3.3%) think it is safer for foetus. In their opinion, vaginal delivery is safer for both mother and foetus than CS at head presentation. By contraries, pregnant women prefer CS and at least trust vaginal delivery at the time of breech presentation. Otherwise, those pregnant women who had never heard about ECV before would still choose this procedure without 90-100% of success. Of the 101 subjects who knew about ECV before, 47 women still preferred ECV. Those who did not know about ECV before, from 49 even 21 would still choose ECV and 18 still CS.

**Conclusion.** Many pregnant women do not know about ECV and other delivery ways at breech presentation. Although 101 of 150 subjects have heard about ECV before, their understanding is very poor. Otherwise, those who do not know about ECV before are more likely to consider it. To change all pregnant women attitude towards ECV and other delivery methods during breech presentation we need to talk more about it in public, social media and so we will do less CS.

## KNOWLEDGE ABOUT MENOPAUSE AND WAYS OF TREATMENT MENOPAUSE SYMPTOMS IN MIDDLE-AGED LITHUANIAN WOMEN

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**Keywords.** Caesarean section(c-section), breastfeeding.

**Objectives.** Nowadays in Lithuania women are experiencing longer active and more qualitative life than before, that is why the menopause has higher importance. The aim of this study was to find out the amount of knowledge women have about menopause and their approach to symptoms.

**Materials and methods.** Altogether 266 women aged 40 to 66 (the mean of age was 56) were enrolled to the cross - sectional study. Females were given a questionnaire regarding questions whether or not they know/knew about menopause, have they consulted a doctor and what measures were taken.

**Results.** 66.16% (n = 266) females reported that they knew about menopause and that it was expected. 20.67% have not noticed any significant changes. For 6% of correspondents menopause was unexpected and they had no clue. And 4% of women were afraid of this period. 33.45% consulted the doctor because of menopause symptoms. 35% of women used non - hormonal therapy. 15.78% started regularly exercising. Only 4.5% of women used hormonal therapy and it was effective for 75% of women who used it.

**Conclusion.** Even though two thirds of correspondent women knew about menopause, every third woman had to consult a doctor because of experienced menopause symptoms. There are many ways of treating those symptoms, the most popular being non - hormonal microelement and multivitamin therapy, different physical activities reported less popular and hormonal therapy being the least common.

## KNOWLEDGE OF MEDICATION USE DURING BREASTFEEDING

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**Keywords.** Breastfeeding, mother, medication

**Objectives.** Breast milk is considered as the best nutritional source for newborns. Most drugs administered to the mother are secreted in breast milk. Though amount ingested by the infant is small and has no or little effect, there are medications contraindicated during breastfeeding. The aim of study was to find if women know restrictions on the medication use during lactation period.

**Materials and methods.** A cross-sectional study was conducted in Riga Maternity hospital from February to June 2018 as a self-filled questionnaire by women postpartum with no restrictions for lactation. Data were further analyzed with Microsoft Excel and SPSS 21.0.

**Results.** 120 primiparas and 149 multiparas filled questionnaire. Mean age – 30(SD 4,9; range 16 – 43) years. 231(85.9%) knew what exclusive feeding is. 46(16.2%) used any medications in postpartum period. 227(84.4%) knew that some drugs are contraindicated during lactation. 156(58.0%) were informed that medication goes into breast milk. 213(79.5%) responded that it is better to use drugs after breastfeeding act, not before. 10(3.7%) had never read a drug package leaflet. 184 (68.4%) noted that paracetamol, 32(11.9%) aspirin, 31(11.6%) antifungal drugs can be used during lactation. 28(10.4%) noted that gastric acid-lowering medications and 27(10.1%) phenylephrine containing nasal drops can be used during lactation. 180(66,9%) mentioned that it is necessary to use vitamin D as supplement, 18(6.7%) iodine, 133(49.4%) calcium, 80(29.8%) magnesium and folic acid 47(17.5%). 79(53.0%) multiparas more often, but not reaching significance, considered complex vitamins should be used during lactation compared to primiparas 51(42.5%;  $p = 0.086$ ). 88(32.7%) noted that they found information about drugs on the Internet.

**Conclusion.** Women are informed that certain medications may get into breast milk, as well as the use of different vitamins are necessary during lactation. At the same time, women marked not recommended individual medication use, leaving out the ones, which are necessary for the development of the child.

## NON-DISABLED AND DISABLED WOMEN SEXUAL HEALTH COMPARISON

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**Keywords.** Sexual health, disabled women.

**Objectives.** Regardless of disability level women are interested in maintaining sexual activity. Disabled women constitute approximately 16% of all women in Europe. Their sexual health is often ignored, which causes lack of knowledge on these issues. The aim of the study was to compare and understand if there are sexual health disparities between disabled women (DW) and non-disabled women (NDW).

**Materials and methods.** A cross-sectional study was conducted in different associations for disabled people and the general practitioner's office in Latvia from November 2018 to January 2019. Data were collected from self-filled questionnaires of 31 DW and 31 NDW, further analysed with Microsoft Excel and SPSS 21.0.

**Results.** The mean age of NDW was 34(SD 10.7; range 22-61) and 44(SD 14.1; range 23-75) of DW. DW were partially satisfied with their sex life (n = 24; 77.4%) compared to NDW (n = 14; 45%; p = 0.024). (51.5%; n = 16) DW sex life is irregular, (25.8%; n = 8; p = 0.002) NDW admitted to have irregular sex life. NDW (61.3%; n = 19) have had last sexual intercourse within 6 days period compared to DW (29.0%; n = 9; p = 0.007), and more frequently DW noted not having sexual relations for a long period after receiving disability status. (74.2%; n = 23) DW have not noticed changes in their partner's attitude. NDW think their sex life will improve in future (61.3%; n = 19) versus (22.6%; n = 7; p = 0.006) DW. DW are interested in maintaining sexual relations (67.7%; n = 21), as well as NDW (90.3%; n = 28). (22.6%; n = 7) DW are interested in maintaining sexual relationships, but less than before disability. Respondents (35.5%; n = 11) from both groups noted that the level of disability or other health disorders have little impact on their sexual health.

**Conclusion.** The study demonstrates that NDW have regular sex life and are more satisfied with it than DW. Regardless the state of health women are interested in maintaining sexual activity.

## NUTRITION AND EATING HABITS DURING PREGNANCY IN WOMEN WITH BODY MASS INDEX OVER 25 KG/M2

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**Keywords.** Nutrition, eating habits, increased body mass index, pregnancy.

**Objectives.** Nutrition and eating habits play a significant role in keeping good health and prevention of diseases. Nowadays unhealthy and unbalanced nutrition together with sedentary lifestyle causes increased weight, obesity and high risk of noncommunicable diseases. Obesity in pregnancy and increased gestational weight gain correlates with various complications for a woman as well as a child. The aim of this study was to research eating habits in pregnant women with body mass index (BMI) over 25 kg/m<sup>2</sup> in Riga and to acknowledge awareness of women about the recommendations on nutrition during pregnancy with special focus on women with increased BMI.

**Materials and methods.** This study included 60 postpartum women, divided into two groups: 30 women with BMI over 25kg/m<sup>2</sup> (study group) and 30 women with BMI from 18.5 to 24.9kg/m<sup>2</sup> (control group). Questionnaire was developed based on the guidance of "Proper maternal nutrition during pregnancy planning and pregnancy: a healthy start in life. Recommendations for health care professionals – the experience from Latvia" (2017). Statistical analysis was performed with SPSS statistics analysing software.

**Results.** BMI was significantly higher in the study group (the median BMI was 28.5). In both groups a number of unhealthy eating behaviours were diagnosed confirming the lack of proper consultations before and during pregnancy or low motivation. 70% of respondents in the control group and 66.7% in the study group did not change their eating habits during pregnancy. Only 6.7% of respondents in both groups were informed by healthcare providers about the recommendations on nutrition during pregnancy.

**Conclusion.** We confirmed that recommendations on nutrition before and during pregnancy for health professionals has not reached women in both groups. It proves the need to ensure active role of health professionals in promoting healthy nutrition before and during pregnancy and to find innovative ways in informing women and society.

## POSTPARTUM ENDOMETRITIS: PREVALENCE OF PREGNANCY RELATED RISK FACTORS IN RIGA MATERNITY HOSPITAL

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**Keywords.** Postpartum endometritis, obstetrics.

**Objectives.** Postpartum endometritis (PPE) is an inflammation of uterus' inner layer with polymicrobial genesis, which develops within 24 hours postpartum and manifests as febrile morbidity. There are many pregnancy and childbirth related risk factors for this condition. The study aim was to evaluate pregnancy period related risk factors in women diagnosed with PPE in Riga Maternity Hospital.

**Materials and methods.** A retrospective analysis was carried out using the data collected from medical documentation of Riga Maternity Hospital during the period from January 2017 – December 2018. Study was confirmed by the Ethics Committee of Riga Stradiņš University. The results were analyzed using SPSS 23.0 program.

**Results.** The research included 161 cases of PPE, which took 1.3% of all deliveries in this period (total n = 12476). 77.4% (n = 125) of women had at least one risk factor for PPE during the course of pregnancy. The prevalence of vaginal infection was reported in 10.6% (n = 17). Urinary tract infection was depicted in 10% (n = 16) and colonization with group B Streptococcus in 8.7% (n = 11), 35 cases with unknown colonization status. Maternal anemia was reported in 34% (n = 54) and diabetes mellitus in 11.3% (n = 17). In 1,2% (n = 2) of cases HIV/AIDS was depicted. The most common age of woman with PPE reported was 29 y.o. (9,3%, n = 17). PPE was prevalently depicted after the first labour (57,9%, n = 106).

**Conclusion.** This research depicts that the majority of women had at least one pregnancy-related risk factor. Maternal anemia was declared in many cases, as well as vaginal and urinary tract infection, and colonization with group B Streptococcus, being essential pregnancy-related risk factors predisposing to PPE. The awareness on the prevalence of pregnancy-related risk factors could suggest on the better ways of PPE prevention.

## ROLE OF DIET AND EXERCISE ALONG WITH MEDICINES IN PCOS

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**Keywords.** Women infertility, Poly-Cystic Ovarian Syndrome (PCOS), nutrition.

**Objectives.** Women infertility has become one of the major concerns nowadays and PCOS is among leading causes of the same. PCOS is a hormonal disorder, causing enlarged ovaries with small cysts on the outer edges leading to elevated serum concentrations of total testosterone by the ovaries and thus disturbing menstrual cycle, stimulating weight gain and hirsutism, thus making female at lesser chances to undergo gestation period. Hyperandrogenism or PCOS is the most common reason for markedly irregular cycles (> 90 days in length). This research is done to implicit the misconception of patients who rely only on medicines for PCOS treatment, and to highlight the importance of a healthy lifestyle including regular exercise and systematic nutrition consumption, by drawing comparison between two different methods of treating of PCOS. The aim of this study was to assess the significance of diet and exercise along with medicines in PCOS.

**Materials and methods.** This study comprised 80 female patients divided into 2 equal groups, aged 18-45 years, presented to S. Mehar Singh Hospital. PCOS was confirmed by clinical symptoms and vital signs like elevated blood pressure, (135/90 mm-Hg) even in young women. Most women were obese at the regions of upper arm, upper back and abdomen. However, one-third were not. Hirsutism at the areas of chin, neck, cheeks, chest and peri-areolar area; acne, and hyperinsulinemia were observed. Ultrasound of pelvic organs demonstrated ovarian cysts and enlarged ovaries. LH:FSH ratio was high, between 1.50 to 3.50 with average value 2.612 for both the groups and total.

**Results.** 1st group patients were treated only with medicine, Myo-inositol 1gm, Vitamin D3 1000 IU, twice a day after meals, and Tablet Elestra once daily for 21 days and continued from fifth day of menstruation period. For 2nd group, a systematic strategy was planned in which nutrition planning, regular exercise and medications, were combined for effective treatment, followed as, breakfast by 8:00, lunch by 13:00, and dinner by 19:00, along with regular exercise in morning and brisk walk in the evening for 60 minutes. Additional data was collected by regular reports for 6 months. Associations between lifestyle and PCOS were established by statistical analysis.

**Conclusion.** 2nd group: Fall in LH:FSH ratio from 2.612 to 1.1, reduction in the number of ovarian follicles and significant reduction in the duration of menstrual cycle and inter-menstrual interval. 4 women conceived during treatment. 1st group ratio came down only till 2. Hematological and biochemical parameters were within normal limits before and after the treatment. No adverse effects were reported during the study. Healthy lifestyle along with prescribed medications work more effectively than medicines alone.

## THE FACTORS INFLUENCING MATERNAL-FETAL BONDING

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**Keywords.** maternal-fetal relations, pregnancy, behavior and behavior mechanisms, family relations, parent-child relations.

**Objectives.** Literature suggests that there are various factors affecting maternal-fetal relationship. It is evident that mother's attachment to her unborn child has a strong impact for pregnant woman's attitude towards her health, postnatal attachment and the child's physical and emotional growth. The aim of our study was to identify the factors that impact maternal-fetal relationship.

**Materials and methods.** We developed the original questionnaire which included information of demographical data, gynecological and obstetrical history, relationship assessment scale, the index of happiness, the antenatal depression risk questionnaire and Maternal-Antenatal Attachment Scale. Study inclusion criteria were pregnant women at any time during pregnancy who gave freely informed consent and agreed to fill the original paper-based questionnaire with no help from other family members. The data were collected from November 2017 to April 2018 in Vilnius University hospital Santaros Klinikos. The calculations were obtained using Microsoft Excel and IBM SPSS software.

**Results.** Total of 388 pregnant women were included in the study. It was found that level of education, obstetrical issues during pregnancy and the risk of postnatal depression negatively impact the maternal-fetal relationship ( $p < 0.05$ ). Mothers who were elder in family birth order, also those whose pregnancy was of longer duration, who had better quality of romantic relationship with partner and whose socioeconomic fulfillment was higher were all found to have a better quality of maternal-fetal bonding ( $p < 0.05$ ).

**Conclusion.** Many factors that lead to diminished maternal-fetal bonding are preventable. It is important to understand the necessity to determine the factors which affect maternal-fetal relationship in a negative fashion. The early recognition of low attachment and right application of various means of psychologic intervention might improve the quality of pregnancy, maternity and childhood.

## THE IMPACT OF OPERATIVE VAGINAL DELIVERY, C-SECTION AND PERINEAL TEARS ON FEMALE POSTPARTUM QUALITY OF LIFE AND SEXUAL FUNCTION

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**Keywords.** Vaginal delivery, perineal tears.

**Objectives.** Many women face with complications during delivery which can influence women's postpartum period, having an effect on their quality of live and sexual function. The aim of this study was to evaluate the impact of operative vaginal delivery, perineal tears and previous history of caesarean section on female quality of life and sexual function after previous vaginal delivery.

**Materials and methods.** Descriptive cross-sectional study using patient questionnaire about changes of quality of live and sexual function after previous vaginal delivery was carried out in Riga Maternity Hospital, including 93 postpartum women, and using computer-based questionnaire, including 321 postpartum women. The study was approved by the Ethics Committee of Riga Stradiņš University. Data were analysed using Microsoft Excel and SPSS 23.

**Results.** 31(7,5%) women had operative vaginal delivery. 31(7,5%) had history of previous caesarean section, 14(45,2%) age 26-30, 9(29,0%) age 31-35, 7(22,6%) were older than 35. 14(45,2%) had 2 pregnancies, 15(48,4%) had 3-5 pregnancies. 310(74,9%) women had perineal tears after previous vaginal delivery, 130(41,9%) were 26-30 aged, 95(30,6%) were 31-35 aged. 134(43,2%) had 2 pregnancies, 85(27,4%) had 3-5 pregnancies. 120(38,7%) continued their sexual life less than 6 weeks after delivery, 139(44,8%) in 2-3 months after delivery, 28(9,0%) 4-6 months after delivery and 23(7,4%) later then 6 months after delivery comparing with 55(53,4%) women without perineal tears, who continued their sexual life less than 6 weeks after delivery. 89(28,8%) complained about constant and 106(34,3%) about occasional discomfort and pain during intercourse. 155(50,0%) did not discuss their problems with gynaecologist.

**Conclusion.** Women who had perineal tears in previous deliveries show significant association with problems in postpartum period, which women did not find necessary to discuss with gynaecologist. Nevertheless, changes in postpartum quality of life and sexual function were not different between women who had experienced physiological or operative vaginal delivery or caesarean section.

## UMBILICAL CORD PROLAPSE AND PERINATAL OUTCOMES

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**Keywords.** Umbilical cord prolapse, perinatal outcomes

**Objectives.** Umbilical cord prolapse (UCP) is an obstetric emergency in which the umbilical cord drops below the presenting part of the fetus which can result in fetal asphyxia. The incidence varies between 0.1% and 0.6%. Possible risk factors include prematurity, low fetal birth weight (below 2500 g), non-vertex presentation, polyhydramnios, amniotomy, multiparity and long umbilical cord. The aim of the study was to identify possible risk factors of UCP, management strategies and perinatal outcomes.

**Materials and methods.** The retrospective descriptive study included all cases of UCP in Riga Maternity Hospital in time period between 2013–2017. Two controls per case were randomly selected. The obtained data was analyzed using MS Excel and IBM SPSS.

**Results.** During a five year period, 34 cases of UCP were identified out of total 33 296 deliveries, which was 0.102% of all deliveries. Statistical analysis of the obtained data between groups showed that neonatal factors, such as non-vertex presentation ( $p = 0.04$ ), neonatal weight below 2500 g ( $p = 0.002$ ) and polyhydramnios ( $p < 0.0002$ ) were associated with higher risk of UCP, but maternal age ( $p = 0.248$ ), gestational week ( $p = 0.424$ ), parity ( $p = 0.235$ ) and umbilical cord length ( $p = 0.601$ ) had no significant association. Amniotomy was on the border of significance of being recognized as risk factor ( $p = 0.052$ ). The cesarean section was performed in 79.4% of UCP cases, whilst in control group just in 34.3% cases ( $p = 0.00002$ ). Apgar score below 7 in first minute was found in 76.5% of newborns with UCP, while in control group in 97% ( $p = 0.002$ ).

**Conclusion.** Low birth weight, non-vertex presentation and polyhydramnios are associated with higher risk of UCP. Other factors cannot be excluded as risk factors because of the small number of cases. UCP is associated with lower Apgar scores in first minute and cesarean section is the most used management strategy of UCP.

## FREQUENCY OF MENOPAUSAL SYMPTOMS IN MIDDLE AGED LITHUANIAN WOMEN AND THEIR EFFECT ON SELF-ESTEEM AND QUALITY OF LIFE

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**Keywords.** Menopause, symptoms, quality of life.

**Objectives.** To identify the frequency of menopausal symptoms in a group of middle aged Lithuanian women and evaluate their impact on self-esteem and quality of life.

**Materials and methods.** A cross-sectional study was carried out involving 266 women aged 40 to 66 years in Lithuania.

**Results.** Mean age of women was 56. The survey questionnaire included 28 different symptoms of menopause comprising vasomotor (hot flashes, sweating, tachycardia, etc.), psychological (anxiety, mood swings, forgetfulness etc.), urogenital/sexual (dyspareunia, loss of libido, urinary incontinence, etc.) and skin (dryness of skin and mucosa, brittle nails, etc.). Sweating was the most frequent symptom (50%), followed by hot flashes (49,6%), fatigue (38%), increasing body weight (37,9%), and sleep disorders (33,8%). Much more than half of the women (78,1%) stated that menopause had no unfavorable effect on their self-esteem and 79% of them did not notice any significant changes in the quality of life at the onset of menopause. Whereas the remaining proportion of women (respectively 21,8% and 20,7%) claimed that they felt their quality of life and self-esteem deteriorating. The majority of women (60-70%) who perceived menopause as self-esteem and quality of life affecting process were those who linked psychological symptoms such as depressive mood and irritability with this life period.

**Conclusion.** Among Lithuanian women, vasomotoric menopausal symptoms were the most frequently reported. Only little over a fifth of women held negative view of menopause, while the vast majority of women did not notice a change in life quality and a decline in self-esteem. Similar studies are important for women to become familiar with the diversity of menopausal symptoms and consequently enable them to improve the quality of life.

# PSYCHIATRY, PSYCHOTHERAPY, PSYCHOSOMATICS, NEUROLOGY

## COGNITIVE IMPAIRMENT AND SIGNS OF DEPRESSION IN PATIENTS WITH EPILEPSY

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**Keywords.** Epilepsy, cognitive impairment, depression.

**Objectives.** Epilepsy is often associated with depression and cognitive impairment. The study was performed to determine the degree of these associations.

**Materials and methods.** Cases were gathered in a cross-sectional study by interviewing patients at the Neurology and Neurosurgery Clinic of Riga East Clinical University Hospital center "Gaiļezers" in time period from May to December of 2018 using the Hamilton 17-item depression scale (HDS) and the Montreal Cognitive Assessment scale (MoCA). The data was collected and statistically analysed with Microsoft Excel and SPSS v22.0 software packages.

**Results.** A total of 16 patients were included in the study, of whom 8 (50%) were men, median age of 28 (IQR, 21-48) and 8 (50%) were women, mean age of 44 (CI, 29-58). There was no statistically significant difference between the age median values ( $U = 18,00$ ;  $p = 0,161$ ). The mean duration of illness was 15 years (CI, 9-25). The mean score of MoCA was 20 (CI, 17-23). 4 patients (25%) had no cognitive impairment, whereas 12 patients (75%) had varying degrees of cognitive impairment. The mean score of HDS was 9 (CI, 5-13). 12 patients (75%) had no significant signs of depression whereas 4 patients (25%) had varying degrees of severity of depression. There was a moderate positive statistically significant correlation ( $r = 0,516$ ;  $p = 0,041$ ) between cognitive impairment and duration of illness with a determination coefficient of  $R^2 = 0,3486$  through linear regression. There was no statistically significant correlation between depression and duration of illness ( $p = 0,517$ ).

**Conclusions.** Cognitive impairment is more prevalent in patients with epilepsy than signs of depression. There is a statistically significant moderate causal correlation between duration of illness and cognitive impairment. There was no statistically significant correlation between depression and duration of illness, although a larger study group is required to more accurately test the correlation.

## CORRELATION BETWEEN ARTERIAL BLOOD PRESSURE AND FUNCTIONAL OUTCOMES IN PATIENTS WITH HYPERACUTE STROKE AND PERFORMED REPERFUSION THERAPY

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**Keywords.** Hyperacute stroke, blood pressure (BP)

**Objectives.** Stroke is one of the leading cause of death worldwide (Lopez et al.,2006). Part of survived patients experience long-term disability even after performed reperfusion therapy. Research objectives were to investigate BP and some other factors impact on therapy outcomes.

**Materials and methods.** Retrospectively 250 consecutive patients (01.09.2017-31.08.2018) with ischemic stroke and performed reperfusion therapy were selected within archive of a single university hospital. Necessary data were recorded. Stroke severity was assessed by both NIHSS and mRS scales. For BP analysis were used BP levels proposed by ESC/ESH(2013). The obtained data were analyzed in SPSS 22.

**Results.** In the research were evaluated 117(46,8%) males and 133(53,2%) females, with the mean age of  $73,0 \pm 12,1$ (SD) years. To investigate pre-therapy BP impact on reperfusion therapy results patients were stratified into following BP groups by both systolic and diastolic BP: optimal, normal, high normal, Grade 1 hypertension, Grade 2 hypertension, Grade 3 hypertension. The higher pressure was on the admission day, the worse functional results were on discharge(Systolic - NIHSS  $p = 0,005$ , mRS  $p < 0,0005$ ; Diastolic - NIHSS  $p = 0,035$ , mRS =  $0,051$ ). Improving in NIHSS and mRS scores was equally visible in all six groups categorized by diastolic BP on admission day( $p < 0,0005$ ) with better NIHSS results in normal pressure group(4,9 points). Categorization by systolic BP on admission day demonstrated lower NIHSS score in optimal pressure group(1,9 points) with good improvement( $p = 0,005$ ). Some other factors had statistically significant impact on NIHSS score on the day of discharge for all patients: age( $p < 0,0005$ ), pulse and SpO<sub>2</sub> on admission day( $p = 0,043$ ,  $p = 0,008$  accordingly), pulse and SpO<sub>2</sub> 24 hours post-therapy( $p < 0,0005$ ,  $p = 0,023$  accordingly).

**Conclusions.** Systolic and diastolic blood pressures on admission stage can be used as predictable factors for reperfusion therapy outcome. Such factors as age, pulse and SpO<sub>2</sub> had visible impact on post-therapy NIHSS results.

## POST-STROKE FATIGUE INCIDENCE AMONG PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL, CENTRE OF NEUROLOGY PATIENTS

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**Keywords.** Stroke, post-stroke fatigue.

**Objectives.** At present, there is no consensual, clear definition of Post-stroke fatigue (PSF) and this is partly because of syndrome's complexity. PSF differs from normal fatigue that results from overexertion and is relieved by rest. In fact, PSF is a disease state characterized by a chronic, persistent, excessive lack of energy with an impact on activities of daily living. The aim is to investigate the prevalence of PSF among ischemic stroke inpatients, to study the risk factors associated with PSF.

**Materials and methods.** Respondents were Neurology clinic patients 7-14. day post stroke. Inclusion criteria: MOCA more than 15 points, NIHSS less than 15 and Modified Rankin Scale less than 4; without any other CNS disease, severe somatic disorder and oncology. Post-stroke fatigue severity was assessed using Fatigue Severity Scale (FSS), depression using Beck Depression Inventory (BDI). The obtained data were analysed in SPSS Statistics.

**Results.** 62 inpatients from which 32(52%) were females and 30(48%) were males. Mean age was  $66.55 \pm 11.28$  years. Subjectively females assessed themselves as more fatigued than before the stroke in 28.1% of the time, males accordingly in 30%( $p = 0.87$ ). Mean BDI score for females was 9.56(SD 8.25), males 10.93(SD 8.00) ( $P = 0.51$ ). Alone living patient's mean FSS score was 4.95(SD 1.06), in family living 4.87(SD 1.75) ( $p = 0.80$ ). When affected dominant hemisphere mean FAS score was 5.17(SD 1.31) and non-dominant hemisphere affected mean FSS score was 5.04(SD 1.36) ( $P = 0.73$ ). Patient's with higher FSS score 22% of the time admit that their sleep quantity and quality is worse than before. Though none patient with lower FSS score evaluate their sleep as changed.

**Conclusions.** The study showed that fatigue is a common symptom in post-stroke patients. However, it is difficult to emphasize specific risk factors that could prognostically anticipate which patients could be more severely affected.

## REPERFUSION THERAPY IN ACUTE ISCHEMIC STROKE: COMPARISON OF OUTCOMES IN ISCHEMIC STROKE SUBTYPES

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**Keywords.** Reperfusion therapy (RT), ischemic stroke subtypes.

**Objectives.** The outcomes of RT performed in ischemic stroke patients are very variable. That may be due to different types of ischemic stroke. Therefore, research objectives were to investigate demographic data, assess RT effectiveness and identify factors affecting therapy results in ischemic stroke subtypes.

**Materials and methods.** Retrospectively 152 consecutive patients (01.01.-31.08.2018) with ischemic stroke and performed RT were selected within archive of a single university hospital. Necessary data were recorded. Stroke severity was assessed by both NIHSS and mRS scales. Further, cases were stratified by stroke subtypes and analyzed in SPSS 22.

**Results.** The demographic characteristics: large artery atherosclerosis group (LAA) (21,7%) with 21 males and 12 females, with the mean age of  $74,0 \pm 9,8$ (SD) years; cardioembolic group (CE)(52,0%) – 34 males and 45 females,  $76,1 \pm 10,4$ (SD) years; 1 male (74 years) and 2 females (63 and 86 years) in small vessel occlusion group (SMO)(2%); cryptogenic group (CG) (24,3%) – 15 males and 22 females,  $67,9 \pm 16,1$ (SD) years. Further, nonparametric tests were performed (except SMO group). Improving in NIHSS and mRS scores after RT was statistically significant in all three groups ( $p < 0,0005$ ). Significantly better NIHSS ( $p = 0,010$ ) and mRS ( $p < 0,0005$ ) results on discharging day were in CG group. Reversible strokes were common in CG group ( $p = 0,008$ ). Post-therapy NIHSS results in CG group had statistically significant negative correlation with pre-therapy SpO<sub>2</sub> rates ( $p = 0,015$ ) and positive correlation with pre-therapy systolic blood pressure ( $p = 0,036$ ) and 24 hours post-therapy ( $p = 0,003$ ). 48 hours post-therapy pulse had a positive correlation with post-therapy NIHSS ( $p = 0,045$ ) in CE group. Temperature 24 hours after applied therapy had a positive correlation with post-therapy NIHSS in all three groups (LAA( $p = 0,012$ ), CE( $p = 0,023$ ), CG( $p = 0,013$ )).

**Conclusions.** Visible post-therapy improvement was observed in LAA, CE, CG groups. Factors like SpO<sub>2</sub>, systolic blood pressure, pulse and temperature had impact on outcomes in specific stroke subtypes.

## COGNITIVE, MOOD AND SLEEP IMPAIRMENT IN ANEURYSMAL SUBARACHNOID HEMORRHAGES

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**Keywords.** Aneurysmal subarachnoid haemorrhage, cognition, mood, sleep impairment.

**Objectives.** Aneurysmal subarachnoid haemorrhage (aSAH) is the extravasation of blood between the arachnoid and pial membranes of the brain. According to statistics, four out of seven persons who survive aSAH will have disability. Some studies have found association between depression and aSAH, whereas other authors claim possible cognitive impairments after the rupture. Nevertheless, the consequences of aSAH on cognition, mood and sleep have not been studied in Latvia, thus this knowledge would be essential for future rehabilitation of aSAH patients. The aim is to show that disorders after aSAH are very common.

**Materials and methods.** Clinical data of 533 patients (62% females) with aSAH treated in Pauls Stradiņš Clinical University Hospital, Neurosurgery clinic (between January 01, 2010 and August 31, 2018) was collected and invited for examination. 24 patients participated in the interview with tests including Montreal Cognitive Assessment (MoCA), Mini Mental State Examination (MMSE), Hospital Anxiety (HADS-A) and Depression Scale (HADS-D), Beck Depression Inventory (BDI), Fatigue Severity Scale (FSS), Epworth Sleepiness Scale (ESS) and Insomnia Severity Index (ISI). Data was processed using Microsoft Excel and IBM SPSS. Pearson's correlation coefficient (PCC) was used to determine strength of associations.

**Results.** Altered MMSE score was found in 13%, and 38% had abnormal MoCA score. However, abnormal MoCA score was more expected in patients with SAH of Fisher Grade 4. According to ISI mild to severe insomnia was present in 38%, whereas 42% of patients had abnormal sleep according to ESS, with 46% experiencing fatigue. A negative correlation was found between WFNS scale and ESS (PCC,  $[r] = -0.609$ ,  $P < 0.05$ ). 33% had mild to moderate mood disturbances according to BDI, 13% had abnormal HADS-D and 17% had abnormal HADS-A.

**Conclusions.** Abnormal sleep, insomnia and fatigue are the main issues among cognitive, mood and sleep impairments, suggesting improved outcome if measures taken to prevent.

## THE ANALGESIC EFFECT OF SINGLE ANODAL TRANSCRANIAL DIRECT CURRENT STIMULATION IN INDIVIDUALS WITH PERIPHERAL NEUROPATHIC PAIN

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**Keywords.** Transcranial direct current stimulation, neuropathic pain, Numeric Pain Rating Scale, Neuropathic Pain Symptom Inventory, Patient Global Impression Of Change.

**Objectives.** Prevalence rates of chronic pain vary from 2% to 55% in general population studies. Prevalence of neuropathic pain lie between 7% and 10%. Several studies have explored the contribution of transcranial direct current stimulation in the treatment of numerous pain disorders. It may soon be used alongside (or in replacement of) drug treatments. Our objectives are to evaluate analgesic effect of single anodal tDCS in individuals with peripheral neuropathic pain (NP).

**Materials and methods.** A prospective study carried out at Neuroimmunology and immunodeficiency centre in Riga, Latvia. Seventeen participants were randomly divided into two groups: active-tDCS (n = 11) and sham-tDCS (n = 6) group. Single anodal primary motor cortex tDCS was administered for 20 min at a 2-mA current intensity. Before and 24 hours after the stimulation, participants were evaluated using Numeric Pain Rating Scale (NPRS), Neuropathic Pain Symptom Inventory (NPSI) and Patient Global Impression of Change (PGIC) scales.

**Results.** The active-tDCS resulted in greater decrease in the NPRS and improve in the PGIC scores 24 hours after stimulation, in comparison with sham-tDCS group, but our results show, that it was not significant; however, NPSI total score in active-tDCS group resulted in significant decrease (p = 0.0065). All types of pain included in NPSI were reduced, but abnormal sensations (paraesthesia/dysesthesia, such as pins and needles) were significantly reduced (p = 0.0097).

**Conclusions.** According to the results of the study, we can assume that the pain itself is less reduced than its character changes. The results indicate a low sensitivity of the NPRS for evaluating neuropathic pain and the use of more detailed scales (such as NPSI) improves their evaluating.

## CHRONIC CENTRAL NERVOUS SYSTEM INFLAMMATION WITH IDENTIFIED ETIOLOGY IN IMMUNOCOMPETENT PATIENTS IN RIGA EAST CLINICAL UNIVERSITY HOSPITAL

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**Keywords.** Chronic neuroinfection, chronic meningitis.

**Objectives.** Central nervous system (CNS) infections are defined as chronic when they last more than 4 weeks. Research on this topic is scarce. Despite profound examination and testing, the cause remains unknown in more than 1/3 of cases. Differential diagnoses include autoimmune and paraneoplastic CNS syndromes, tuberculosis, syphilis, fungal infection, and others. Although rare, they remain a challenging diagnosis for neurologists worldwide. The main objective is to identify common etiologies, evaluate the used diagnostic approach and treatment in patients with chronic CNS inflammation.

**Materials and methods.** A retrospective study with information obtained from medical data of patients with chronic CNS infection or inflammation treated in Riga East Clinical University Hospital "Gaiļezers" from 2012 to 2018. Data was analysed with Microsoft Excel and SPSS.

**Results.** Chronic CNS infection or inflammation was found in 12 patients (mean age  $48.0 \pm 15.3$  years). On average, they spent  $49.1 \pm 37.5$  days in the hospital. Mean time from first symptoms to hospital admission was  $47.3 \pm 61.5$  days. Mean time from first symptoms to a final diagnosis was  $87.2 \pm 102.0$  days. Mean number of investigations during hospitalisation per patient was  $43.0 \pm 28.3$ . Mean time from patient hospitalisation to diagnosis was  $25.7 \pm 32.9$  days. 4 patients had confirmed neurosyphilis, 2 - neuroborreliosis, 2 - NMDAR associated autoimmune encephalitis, 1 - tuberculosis and in 3 cases specific ethology was not found. Mean mRS score at discharge was  $2.9 \pm 1.4$ . There was one case with lethal outcome.

**Conclusions.** Chronic CNS inflammations remains a diagnostic challenge. Identifying the underlying cause is essential for effective management and a preferable patient outcome. More detailed research is needed to evaluate the scope of these disorders and the best approach for treating this patient group.

## RELATION BETWEEN SLEEP-ASSOCIATED PARAMETERS AND EMOTIONAL STATUS AMONG KAUNAS CITIZENS'

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**Keywords.** Sleep quality, sleepiness, depression, anxiety.

**Objectives.** Poor sleep quality is a frequent problem among individuals with mental health difficulties, with reported prevalence rates of up to 78% in inpatient and outpatient populations. The objective of this study was to investigate how the subjective sleep quality and level of sleepiness are related to depression and anxiety levels among Kaunas citizens.

**Materials and methods.** This observational study was performed in Kaunas, the 2nd largest city in Lithuania. 87 (35 men) randomly chosen participants with the mean age of 41.4 (15.5) filled in Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Hospital Anxiety and Depression Scale (HADS).

**Results.** The average scores of PSQI, ESS and HADS did not differ significantly between men and women. Out of 87 analysed cases, the average score of ESS was 5.43 (3.9). Excessive sleepiness (ESS >10) was noticed in 11 (12.6%) cases. The mean of PSQI was 6.49 (3.3). PSQI > 5, that shows worse subjective sleep quality and allows to suspect sleep disorders was found in 48 (55.2%) cases. The average of HADS anxiety score was 6.4 (3.9). Higher HADS anxiety scores (score 8-10) was found in 15 (17,2%) persons. The mean of HADS depression score was 4.1 (3.4). Borderline abnormal (score 8-10) depressiveness was noticed in 12 participants (13.8%). Abnormal condition (score 11- 21) was found in 3 (3.4%) people. Significant correlation between ESS score and anxiety level ( $p < 0.01$ ), ESS score and depression level ( $p < 0.01$ ), PSQI score and anxiety level ( $p < 0.01$ ), PSQI score and depression level ( $p < 0.01$ ) and PQSI and ESS scores ( $p < 0,015$ ) were observed.

**Conclusions.** Worse subjective sleep quality and excessive sleepiness are related to higher levels of depression and anxiety among Kaunas citizens.

## PREVALENCE OF DEPRESSION SYMPTOMS AMONG LATVIAN GENERAL SCHOOL TEACHERS AND RELATED FACTORS

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**Objectives.** The aim is to clarify the prevalence of depression symptoms among teachers of general education schools in Latvia, to compare data with other studies. To view the correlation of depression symptoms with health-related issues.

**Materials and methods.** To clarify the prevalence of depression symptoms among teachers of general education schools in Latvia, to compare data with other studies. To view the correlation of depression symptoms with health related issues.

**Results.** The study included 113 respondents of which 96.5% (95% CI 92.9-99.1) were female and 3.5% (95% CI 0.9-7.1) male. The majority of respondents were 37.2% (95% CI 27.4-46.9) in the 40-49 age group. Symptoms of severe depression were 2.7% (95% CI 0-6.2) of respondents, moderately severe 6.2% (95% CI 2.7-10.6), moderate 14.2% (95% CI 8.8-21.2) mild 46.9% (95% CI 37.2-55.8), 30.1% (95% CI 21.3-38.9) respondents have no symptoms of depression. There is a correlation between the frequency of visits to the general practitioner and the prevalence of symptoms of depression is 0.362 (95% CI 0.171-0.525  $p = 0.00008$ ) using Spearman's non-parametric correlation. Answering the question, "Have you had depression in the last 12 months?" - 16.8% (95% CI 10.6-23.9) no more than in previous years, 7.1% (95% CI 2.7-12.4) - a little more than before and 6.2% (95% CI 2.7-10.6) - much more than before.

**Conclusions.** Compared with data from other studies in Latvia, it can be concluded that the prevalence of depressive symptoms among teachers is higher than in the population. Self-assessment of depression in teachers is much higher than in the population.

## AGRESSION OF PSYCHIATRIC OUTPATIENTS IN RPNC AMBULATORY CARE CENTRE 'PĀRDAUGAVA': A COMPARISON BETWEEN PATIENTS RECEIVING COMPULSORY AND VOLUNTARY TREATMENT

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**Keywords.** Forensic psychiatry, aggression, criminal offence.

**Objectives.** The study characterises forensic psychiatric patients and assesses the predictors of aggression (verbal or physical violence against objects, other people or oneself) and factors leading to criminal behaviour by comparing outpatients receiving compulsory or voluntary psychiatric treatment (CPT and VPT respectively).

**Materials and methods.** Patients were interviewed face-to-face using a questionnaire consisting of 9 modules (including socioeconomic health determinants, aggression, criminal offences, substance abuse) in RPNC Ambulatory Care Centre Pārdaugava between March 2017 and January 2018. BPRS-E and mGAF scoring, as well as patient medical records were used. All statistical analysis was carried out with SPSS 23.0

**Results.** In total 57 patients were interviewed (25 CPT and 32 VPT). Most criminal offences perpetrated by CPT patients took place in 2013 (36%, N = 9; range 2005–2017). The most common type of criminal offence was against property including theft and arson (64%, N = 16); the second most common type was offence against the person (32%, N = 8). A minority of criminal offences (16%, N = 4) were committed by patients under the influence of intoxicating substances. VPT patients were significantly more likely to be diagnosed with mood disorders than CPT patients ( $p < 0.05$ ), while the reverse was true for schizophrenia and substance abuse ( $p < 0.05$  and  $p < 0.001$ ). The sole risk factor for criminal offence for CPT patients was found to be male sex ( $p < 0.001$ ). CPT patients were not found to have been more aggressive than VPT patients in the month before the interview ( $p > 0.05$ ). However, CPT patients who had been aggressive during the past month had significantly lower mGAF scores than other patient groups ( $p = 0,05$ ).

**Conclusions.** Despite stereotypes detrimental to the reintegration of criminally offensive psychiatric patients into society, CPT patients were not found to have been more aggressive than VPT patients and any other differences between CPT and VPT patients were minuscule.

## EVALUATION OF ACE (ADVERSE CHILDHOOD EXPERIENCES) AND MOST COMMON EMOTIONS IN TYPE 1 AND TYPE 2 DIABETES MELLITUS ADOLESCENT PATIENTS

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**Keywords.** Adverse childhood experiences, diabetes mellitus, emotions, glycemic control.

**Objectives.** According to Latvian Disease Prophylaxis and Control centre there were registered 91 571 patients with diabetes mellitus in 2017. 682 out of these patients were less than 19 years old. Studies using ACE questionnaire have found that people who have experienced any ACE are at a greater risk for developing diabetes and having poorer control (Huffhines, et al. (2016)). The aspect of emotions in diabetes patients has been poorly assessed with only few studies available. In a research including 11 615 patients' anger was linked to development of type 2 diabetes (Golden et al. (2005)). The aim of this study was to determine ACE score and its relation with glycaemic control and most common emotions in adolescents with diabetes mellitus (DM) both types.

**Materials and methods.** This is a cross-sectional study including adolescent patients 11-18 years old, diagnosed with DM, in a single university hospital (2018-2019). Adapted ACE-IQ scale and additional questions about their emotional state were obtained. Metabolic control was measured using HbA1c%. Descriptive statistical analysis and Spearman's rank correlation was applied to evaluate the results.

**Results.** There were 37 patients diagnosed with type 1DM and 1 with type 2DM, mean age  $14.16 \pm 2.24$ , diabetes duration  $5.3 \pm 4.4$  years, 47.4% female, HbA1c%  $11.0\% \pm 4.4$ . ACEs: 92.1% of children had experienced an adverse childhood event. The most common experience being community violence in 75% and bullying in 61.1% of cases (most commonly due to diabetes). An association between ACEs and HbA1c% was not found ( $r_s = -0.017$ ;  $p = 0.921$ ). And the most common emotions reported was worry (60.5%), fear (44.7%) and anger (42.1%).

**Conclusions.** There was no association found between HbA1c% levels and ACEs. Although only 7.9% of patients did not experience any of adverse childhood events. Findings of emotions need to be studied further to determine whether they're linked to diabetes.

## PAID SCORE AND GLYCEMIC CONTROL CORRELATION FOR ADOLESCENTS (11 – 18 YEARS) WITH TYPE 1 OR 2 DIABETES MELLITUS

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**Keywords.** Diabetes mellitus (DM), adolescents, problem areas in diabetes (PAID), glycaemic control.

**Objectives.** According to Latvian Disease Prophylaxis and Control centre there were 91571DM patients in 2017. 682 were less than 19 y.o. PAID is a 20 item self-report questionnaire that assesses a range of emotional problems related to having type 1 or 2DM. Previous research has shown that the PAID is a clinically relevant and psychometrically sound instrument (Welch et al.(2003)). Diabetes specific stressors were found to be associated with less adequate self-care and impaired glycaemic control (Peyrot et al. (2005)). The aim is to identify the correlation of PAID score with glycaemic control for adolescents (11–18 y.o.) with type 1 or 2DM.

**Materials and methods.** This is a cross-sectional study including 38 adolescent patients (11-18 y.o.), diagnosed with type 1 or 2DM, in a single university hospital (2018–2019). Patients were given anonymous PAID questionnaire that was translated in Latvian. To evaluate glycaemic control anonymous questionnaire of 10 questions was designed. Descriptive statistical analysis and Spearman's rank correlation was used to evaluate the results.

**Results.** There were 37 patients diagnosed type 1DM and 1 with type 2DM. The mean age  $14.16 \pm 2.24$ (mean  $\pm$  SD). diabetes duration  $5.3 \pm 4.4$ years, 47.4 % female and 52,6 % male. Glycaemic control HbA1c%  $11.0 \pm 4.4$ . Blood sugar level when hypoglycaemia symptoms start was  $3,87 \pm 0,87$ . PAID score was  $22,5 \pm 14.33$ . Association between PAID score and HbA1c(%) was not found( $r_s = -0.138$ ;  $p = 0.410$ ). Association between PAID score and Blood sugar level when hypoglycaemia symptoms start was found ( $r_s = -0.341$ ;  $p = 0.045$ ).

**Conclusions.** Correlation between PAID score and HbA1c(%) levels wasn't found. There were 5 patients that scored over 40 points in PAID scale - which indicates that these patients may be at the level of "emotional burnout". Association between PAID score and Blood sugar level when hypoglycaemia symptoms start was found showing that patients who score higher in PAID scale have lower blood sugar level when hypoglycaemia symptoms start.

## EXPERIENCE OF STIGMATIZATION BY RELATIVES OF PATIENTS WITH SCHIZOPHRENIA

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**Keywords.** Schizophrenia, stigmatization, assessment.

**Objectives.** The experience of stigmatization is very widespread among individuals with schizophrenia, but their close relatives may also experience stigmatization. Stigmatism causes a strong mental burden for the relatives, which is often caused by stress, shame, self-assessment and anxiety. The aim of the research is to explore the stigmatization experienced by relatives of patients with schizophrenia.

**Materials and methods.** The study involved four members of the relatives of patients with schizophrenia. Structured interview method has been used. Codes to be given to subjects by family relationship (e.g. sister, mother, wife, son) to facilitate the analysis of data. During the interview, 3 questions were asked.

**Results.** Even three respondents said they lacked help from healthcare professionals, friends and neighbors: "No support is received from healthcare professionals, because his sickness needs to be proved to them" [wife]; "Feels like no one is trying to help, (...) even some of our relatives have completely cut us off due to his illness" [sister]; "We are always alone, nobody helps us" [mother]. Also, many caregivers experienced insults from other people: "neighbors called us mentally unstable" [mother]. Speaking of relationship with other relatives and friends, every participant said that most of their friends avoid them: "There are only few friends who still stay in touch with us, most of the other friends and relatives hardly speak to us" [wife]. One participant said, that other people blame her because of her son's mental illness: "You can often hear that it is our fault for what happened to him" [mother].

**Conclusions.** Caregivers of person with schizophrenia lack support from other people including healthcare professionals. Relatives often face insults, avoidance and blame from other people. Relatives experience shame, fear, sadness, anxiety and blame due to stigmatization. Healthcare professionals should recognize the stigmatization experienced by caregivers of patients with schizophrenia and help them to cope with negative emotions.

## ADVERSE CHILDHOOD EXPERIENCE IMPACT ON SYMPTOMS OF MENTAL DISORDERS ASSESSED BY LATVIAN CLINICAL PERSONALITY INVENTORY IN PATIENTS WITH ALCOHOL-RELATED DISORDERS

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**Keywords.** Adverse childhood experience, mental disorder symptoms, alcohol-related disorders.

**Objectives.** High prevalence of mental health-related symptoms and adverse childhood experience (ACE) is a known problem in patients with alcohol-related disorders. The aim of this study was to evaluate the impact of ACE on symptoms of mental disorders (SMD) in patients with mental and behavioural disorders due to use of alcohol.

**Materials and methods.** Study was conducted in Riga Centre of Psychiatry and Addiction Disorders from 12.05.2018 until 30.11.2018. The Childhood Trauma Questionnaire (CTQ) was applied to identify 6 traumatic experiences before age of 17; clinical, functional and additional scales from Latvian Clinical Personality Inventory were used to assess SMD. Data was analysed, using Pearson's chi-square test ( $\chi^2$ ) and odds ratio (OR).

**Results.** In total, 39 patients aged 18 - 41 were included in the study. Those, who experienced physical violence in childhood were four times more likely to develop depression symptoms (OR 3.93, 95% CI 1.03 - 15.0,  $p = 0.041$ , Pearson  $\chi^2 = 4.17$ ) and four times more likely to show signs of low self-esteem (OR 3.93, 95% CI 1.03 - 15.0,  $p = 0.041$ , Pearson  $\chi^2 = 4.17$ ). Patients with other ACE, which were not specified in previous CTQ statements (emotional abuse, homelessness, excessive study and work pressure) are four times more likely to develop sleep disturbance symptoms (OR 3.93, 95% CI 1.03 - 15.0,  $p = 0.041$ , Pearson  $\chi^2 = 4.17$ ) and nine times more likely to have suicidal ideation (OR 8.50, 95% CI 0.93 - 77.6,  $p = 0.032$ , Pearson  $\chi^2 = 4.59$ ).

**Conclusions.** Physical violence in childhood can increase the possibility to develop depression symptoms and signs of low self-esteem; other ACEs can increase possibility to develop sleep disturbance symptoms and can increase suicidal ideation in population of patients with alcohol-related disorders.

## THE MENTAL HEALTH EVALUATION OF RIGA UNIVERSITIES STUDENTS

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**Keywords.** Mental health, Medical students, Self-assessment.

**Objectives.** Medical students have been identified as a group at high risk of poor mental health. Research and media reports have highlighted consistently high rates of suicide, depression, anxiety disorders, substance use and self-prescribing in the profession. The objective of this study was to examine and analyze the mental health of medical and non-medical students.

**Materials and methods.** In this cross-sectional study, medical and non-medical students from major Riga universities were asked to fill the questionnaire electronically. Questionnaire consisted from several self-assessment tools, including: The Patient Health Questionnaire-9 (PHQ-9), the Alcohol Use Disorders Identification Test (AUDIT) and the Kessler Psychological Distress Scale (K10). Descriptive statistics were done by using Microsoft Excel (v15.26) and SPSS Statistics (v23.0) software.

**Results.** Altogether 351 students had completed the survey and further were divided into two study groups: medical students (N = 320) and other (non-medical or general population) students (N = 31). The K10 results reported that 21.3% medical and 9.7% non-medical students are likely to have a mild, 15.6% and 16.1%, respectively - a moderate, 15.0% and 16.1%, respectively - a severe mental disorder, (p = 0.478). According to the AUDIT harmful or hazardous alcohol consumption was detected among 12.0% (n = 4) medical students, while among non-medical students - 2.8% (n = 1), (p = 0.014). The PHQ-9 results are as follows: 24.4% medical and 25.8% non-medical students presented with moderate depression, 9.4% and 12.9%, respectively - with moderately severe depression, 4.7% and 9.7%, respectively - with severe depression, (p = 0.566).

**Conclusions.** Our analysis demonstrates that medical students have substantially higher rates of harmful and hazardous alcohol consumption compared to general population. Significant relevance between study program and the severity of symptoms for both mental illness and depression was not observed. Based on the all three self-assessment tools medical students do not appear to have higher levels of psychological distress.

## EMOTIONAL DISTRESS LEVEL AND ATTITUDE TOWARDS PSYCHOTHERAPY AMONG LATVIAN MEDICAL STUDENTS

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**Keywords.** Students, emotional distress, attitude, psychotherapy.

**Objectives.** The term psychological distress may be applied to persons experiencing emotional suffering which may manifest as feelings of stress, anxiety, depressed mood, and burn-out (Dendle C.,2018). Study "Depression, anxiety and distress level among medical trainees in Latvia" states that depression level amongst residents is 35,45%, anxiety 24,94%,distress 53,30% (Sidorova, O., Vrubļevska, J. 2018). Higher anxiety levels and depression is also seen in medical students (Avota, M., Vjakse, A. 2014; Pikaļevs I. 2015). Some of the students choose to overcome their suffers with self-destructive behavior. The aim is to determine the level of emotional distress of medical students, attitude towards seeking psychotherapy and their experience in psychotherapy.

**Materials and methods.** Cross-sectional study with anonymous survey on Google Forms, which includes K10- Kessler psychological distress scale, adapted ATSPPH scale- The Attitudes toward Seeking Professional Psychological Help-Scale and authors' questions. Statistical data was processed in MS Excel and IBM SPSS v22 Statistics.

**Results.** 223 respondents' answers (85,2% women) from first up to final medical study years were analysed. Study shown that 74,4% students have emotional distress, 37,7% of them severe. 78,9% of students shown positive attitude to psychotherapy. Overall psychotherapist's help had seek 46 students mainly women and spending up to half a year in therapy. Students mostly reveal being in psychotherapy, to their surroundings, most often parents and friends. There is correlation between higher distress level and more positive attitude towards psychotherapy ( $p < 0,009$ ) and previous use of psychotherapy and more positive attitude towards psychotherapy ( $p < 0,006$ ).

**Conclusions.** 74% of Rigas Stradins University students have psychological distress, where 37,7% of them severe. Overall attitude towards psychotherapy is positive, but less than 1/5 had seek professional help. Higher distress levels correlate with more positive attitude towards psychotherapy and previous use of psychotherapy correlates with more positive attitude towards psychotherapy.

## THE IMPACT OF PARENTAL EMOTIONAL TRAUMAS ON OFFSPRING'S FREQUENCY OF ADMISSION TO HOSPITAL AND NUMBER OF DIAGNOSIS

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**Keywords.** Parental emotional trauma, childhood trauma, children's health, hospitalization, diagnosis, chronic diseases.

**Objectives.** If a parent has experienced emotionally traumatic event, then there is a possibility that it will affect offspring's health (Lê-Scherban et al.2018). The study objective was to assess the correlation between parental exposure to emotionally traumatic events and children's frequency of hospitalization and number of diagnosis.

**Materials and methods.** In the study participated 30parents (5fathers, 25mothers) and 30children. A cross-sectional study was conducted. The study was performed in an emergency department of Children's Clinical University Hospital. Parental exposure to emotionally traumatic events was assessed using the Childhood Trauma Questionnaire (Instrument author: Pennebaker,J.W.&Susman,J.R.). Offspring's number of diagnosis and frequency of admission to hospital was assessed using semi-structured questionnaire.

**Results.** During parents' lifetime: 1parent have not experienced emotional trauma, 1emotional trauma has been experienced by 5parents, 2-by 4parents, 3-by 7parents, 4-by 5parents, 5-by 5parents, > 5-by 3parents. Prior to the age of 17: 5parents have not experienced emotional trauma, 1emotional trauma has been experienced by 5parents, 2-by 13parents, > 2-by 7parents. Within the last 3 years: 6parents have not experienced emotional trauma, 1emotional trauma has been experienced by 13parents, 2-by 6parents, > 2-by 5parents. Once to the emergency department has been admitted 8children, 2times-7, 3times-4, 4times-5, > 4 times-6children. 16children have never stayed in hospital, 8children stayed in hospital once, 6children-more than once. Within the last year: once to the emergency department has been admitted 14children, 2times-11, > 2times-5children. Within the last year: 25children have not stayed in hospital, 4children stayed in hospital once, 1children-twice. At the time of the study 27children had 1acute illness, 3children had > 1 acute illness, 22children had no chronic diseases, 4children had 1, 4children had 2chronic diseases.

**Conclusions.** Parental traumas' frequency is high. The study in on-going and final results will be discussed in the conference.

## PRESCRIPTION OPIOIDS: DETOXIFICATION TREATMENT AT VILNIUS UNIVERSITY EMERGENCY HOSPITAL

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**Keywords.** Prescription opioids, detoxification.

**Objectives.** Opioids act on mu and delta receptors in the midbrain and are involved in dopamine metabolism. Longterm use of these drugs cause dependence, abstinence syndrome develops as a consequence of sudden cessation. The aim is to analyze prescription opioids consumption features and determine the most prevalent withdrawal symptoms.

**Methods.** We retrospectively evaluated 40 patients, who were diagnosed with opioid dependence to prescription opioids and had undergone opioid detoxification treatment at Vilnius University Emergency hospital from the year 2011 to 2018. Patients admitted for opioid overdose and those who had been using illegal drugs (heroin) were excluded from the study. Since patients had used different kinds of opioids, the doses were converted into morphine equivalent (ME). Data was processed by MS Excel and SPSS 22.0 software.

**Results.** The study population consisted of 40 patients. Mean age was 57.07(SD ± 14.39) years old with 45.0%(n = 18) patients being female and 55%(n = 22) male. Average ME dose was 132.81 mg. After first day of detoxification treatment patients had following abstinence syndrome symptoms: 77.5%(n = 31) of patients felt weakness, 77.6%(n = 31) felt anxious, 22.5%(n = 9) felt fear, 60.0%(n = 24) had insomnia, 37.5%(n = 15) had tremor, 10.0%(n = 4) had dysphagia, 47.5%(n = 19) had nausea, 35.0%(n = 14) had headache. 3 patients haven't had any abstinence syndrome signs. Before hospitalization 6 patients were consuming more than 2 opioids at the same time, 20 patients used morphine, 14 tramadol, 3 methadone, 4 oxycodone, 4 fentanyl, tilidate was used by 1. Mean duration of in-patient treatment was 8,55(SD ± 3.21). Patients who were using tramadol spent statistically significantly more time hospitalized (p = 0.035). Tramadol users' average hospitalization time was 10.0 days, tramadol non-users 7.77 days.

**Conclusions.** More than three quarters felt weakness and anxious during treatment. Half of the patients had been using morphine before detoxification. Tramadol using before treatment had a statistically significant impact on hospitalization time.

## APPEARANCE CONCERNS AND THE BODY DYSMORPHIC DISORDER QUESTIONNAIRE RATES IN HEALTHY ADULTS

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**Keywords.** Body dysmorphic disorder, body dysmorphic disorder questionnaire, appearance concerns.

**Objectives.** There is a growing society pressure on body – image and self – esteem nowadays. Normal appearance concerns should be distinguished from body dysmorphic disorder (BDD). The aim of the study is to identify the normal appearance concerns and BDDQ rates among healthy adults.

**Materials and methods.** Body Dysmorphic Disorder Questionnaire (BDDQ) is a screening tool for BDD. A positive screen requires “Yes” to the both parts of the Question 1, “No” to the Question 2, “Yes” to any of the parts of the Question 3 and  $\geq 1$  hour per day spend thinking about body defect (Question 4). Civil servants from Ministry of Interior, who had no major health problems and were at good mental health, filled in the BDDQ (Latvian or Russian translation).

**Results.** 130 questionnaires were handed out; 116 (89.2%) were eligible.. Demographics: aged 18 – 67, mean age 36.5 +/- 10.1 Females n = 60 aged 18 – 67. Males n = 56 aged 18 – 57. Positive answers: Question 1A – 76 respondents (65,5%); Question 1A and 1B – 34 (29.3%). Question 1A, 1B and Question 2: 21 (%) were excluded from the further testing as their main concern was being overweight. The remain 13 respondents (11.2%) reported the disliked body parts: skin (scars, wrinkles, acne), hair, breasts, stomach and hips shape, shape or size of the nose; they spend less than 1 hour per day thinking about body defect (Question 4). Four respondents (females, aged 27 – 39) reported the impact of body defects on the quality of life (distress), two of them reported difficulties in informal social activities as well, one respondent reported about avoiding certain situations.

**Conclusions.** BDDQ screening in mentally healthy adults is negative. Normal appearance concerns are widespread and most prevalent in females.

## THE IMPACT OF SUBJECTIVE LOCUS OF CONTROL ON BURNOUT SYNDROME AMONG MEDICAL STUDENTS AND RESIDENT DOCTORS IN LATVIA

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**Keywords.** Burnout, locus of control, medical students, resident doctors.

**Objectives.** Chronic stress contributes to the development of burnout. It has been suggested that internal locus of control (LOC) might be associated with lower burnout compared to external LOC (Gazelle et al., 2014). The aim of the study is to evaluate and analyse burnout and LOC in Latvian medical students and resident doctors.

**Materials and methods.** Current cross-sectional study is conducted at the University of Latvia and online. By January 2019, 74 medical students and resident doctors have randomly and voluntarily participated. Participants were surveyed using the Maslach Burnout Inventory - General Survey consisting of 3 scales - Exhaustion, Professional Efficacy and Cynicism (MBI - GS, Maslach, Jackson & Leiter, 1996, adapted in Latvia by Daiga Caune, 2004) and Internal-External Locus of Control Scale (J. B. Rotter, 1966, adapted in Latvia by L. Puķīna, 2000). SPSS Statistics 22 was used for the statistical analysis of the data. Statistical significance level was set at  $p < 0.05$ .

**Results.** Participants were 18 - 40 years old; 55.5% ( $n = 41$ ) were in the age group of 24 - 26 years. 81% were students ( $n = 60$ ). 58% of individuals worked ( $n = 43$ ), with 26% working two jobs ( $n = 19$ ). 35% reported working for more than 40 hours a week. Using Pearson correlation coefficient moderate, negative, statistically significant correlation was found between LOC and Exhaustion ( $r = -0.31$ ,  $p = 0.008$ ), LOC and Cynicism ( $r = -0.41$ ,  $p < 0.001$ ), and a positive, moderate correlation between LOC and Professional Efficacy ( $r = 0.52$ ,  $p < 0.001$ ). Spearman correlation coefficient analysis showed no correlation between age and burnout (Exhaustion  $p = 0.9$ , Cynicism  $p = 0.3$ , Professional Efficacy  $p = 0.5$ ). Burnout rates were not influenced by how many jobs a person worked ( $p > 0.05$ ).

**Conclusions.** More internal LOC may imply lower burnout levels in medical students and resident doctors in Latvia.

## LARGE VESSEL STROKE TREATMENT: BRIDGING THERAPY VS MECHANICAL THROMBECTOMY

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**Keywords.** Intravenous thrombolysis, mechanical thrombectomy, stroke.

**Objectives.** Intravenous thrombolysis (IVT) is considered the first line treatment in patients with large vessel occlusion (LVO). In 2015 mechanical thrombectomy (MTE) became a recommended treatment method for LVO patients. Newest research has shown controversial data about efficacy and safety of BT vs direct mechanical thrombectomy (dMTE), however very few authors considered the role of IVT's dose. The aim was to compare efficacy and safety of BT and dMTE in patients with large vessel acute ischaemic stroke.

**Materials and methods.** Acute ischemic stroke patients treated with MTE for LVO in M1 segment of MCA February 2015 – September 2018 in Vilnius University Hospital Santaros Clinics. Patients were divided into 4 groups according to the dosage of their IVT treatment: bolus of IVT (BT-B), partial dose of IVT (BT-P) and full dose of IVT (BT-F), direct mechanical thrombectomy (dMTE). Demographic, clinical and logistic features were evaluated. The primary study-outcome measure: functional independence at 90 days (mRS 0-2). Secondary clinical efficacy outcomes: successful reperfusion following MTE (TICI 2b-3), change in NIHSS at 24 hours. Safety outcomes: 90-day mortality, any symptomatic intracerebral hemorrhage (sICH).

**Results.** 6 patients were treated in BT-B, 18 in BT-P, 14 in BT-F and 65 in dMTE. There were no significant differences in demographics, vital signs, vascular and other risk factors, with exclusion of use of anticoagulants (0% in BT-B, 11,1% in BT-P, 7,1% in BT-F and 28.3% in dMTE,  $p = 0.035$ ). There were no significant differences in functional independence, successful reperfusion rate, NIHSS change at 24 hours and 90 days mortality. There was a significant difference in sICH rate (0%, 0%, 28.6% and 1.5% respectively,  $p = 0.015$ ).

**Conclusions.** In comparison to BT, dMTE is an effective, safe treatment method. Administration of full dose of IVT causes more sICH. Larger randomized multicentre study is required to support these findings.

## CASE REPORTS

### CENTRAL NERVOUS SYSTEM IMAGING METHODS IN PRENATAL DIAGNOSTICS: A CASE REPORT

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**Keywords.** Hydrocephalus, MRI, prenatal diagnostic, spina bifida.

**Introduction.** Maternal sonographic screening is performed twice (11-13 and 18-20 GW) in Lithuania during uncomplicated pregnancy. In inconclusive or suspicious US findings, fetal MRI can be used as an additional diagnostic tool. These two are key prenatal imaging methods in detecting fetal lesions, and making further decisions about pregnancy.

**Case report description.** A 27-year-old Caucasian, otherwise healthy pregnant female was admitted to Vilnius University Hospital (tertiary health care center) at 33.6 weeks of gestation (GW), because of an abnormal fetal ultrasound study. Previously she had 1 healthy full-term pregnancy and normal vaginal delivery.

Her overall medical condition was satisfactory, fetal heart tones were rhythmic, non-stress test was reactive.

Pathological findings showed by fetal ultrasound (US) were breech presentation of the baby, polyhydramnios, hydrocephalus and neural tube defect- lumbosacral spina bifida (3,1x3,3 cm) and thoracic spinal deformation, asymmetrical fetus growth.

To evaluate the abnormalities detected by prenatal ultrasound, fetal MRI was performed. It confirmed US findings and provided additional information such as: the width of lumbosacral meningocele ~12 mm; 4th ventricle width ~7 mm and since only a small part of brain (~13 mm of cerebral hemispheres) could have been differentiated clearly, the diagnosis was changed to hydranencephaly. Also it was recommended to differentiate MRI findings with Chiari 1.5 malformation and myelomeningocele.

Taking these pathological findings into consideration, the patient was provided with genetic and psychological consultation. At 38.3 GW the pregnancy was ended with a Cesarean Section. The baby was born alive, but with poor prognosis.

**Conclusion.** Spina bifida and anencephaly are the two most common neural tube deformations which can be easily diagnosed prenatally by employing imaging methods. In our presented case, by the time of birth, doctors had already been aware of CNS deformations due to information provided by US and MRI, therefore the baby was referred to neonatologists and neurosurgeons instantly after delivery.

**Summary.** Using MRI to complement US findings, yields precise information about the extent of fetal anomalies, thus making these two non-invasive imaging methods irreplaceable in reaching clinical decisions.

## THE CASE OF FAMILIAL UNILATERAL CEREBRAL VENTRICULOMEGALY

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**Keywords.** Pregnancy, prenatal care, fetal development, cerebral ventriculomegaly, congenital disease.

**Introduction.** The prevalence of fetal cerebral ventriculomegaly is less than 2 percent. Only one case of possible autosomal dominant isolated unilateral ventriculomegaly is described in the literature. We describe the rare case of familial unilateral cerebral ventriculomegaly diagnosed in a family of Lithuanian origin.

**Case report description.** The pregnant woman (gravida 2, para 1) at 28 weeks of pregnancy was referred to Department of Obstetrics and Gynecology for counseling as she was diagnosed with gestational diabetes mellitus. During the transabdominal ultrasound examination of the male fetus, a mild unilateral cerebral ventriculomegaly was found (the diameter of posterior horn of left lateral ventricle was 1,12 cm). There were no other pathologic findings.

The immunologic markers of common congenital infections were negative. The first maternal pregnancy was uncomplicated. Ventriculomegaly was not suspected intrauterine by fetal ultrasound. However, the first child was diagnosed with the asymptomatic left unilateral cerebral ventriculomegaly at the age of 6 months. The parents' family history was reviewed to identify any similar cases in the family. The maternal brain MRI, which was performed two years ago, was entirely normal. The previous paternal brain computed tomography revealed asymptomatic left unilateral cerebral ventriculomegaly. Since the previous clinical cases cover only cytogenetic karyotyping, further comparative genomic hybridization will be performed in our clinic.

**Conclusion.** The prevalence of fetal cerebral ventriculomegaly is less than 2 percent. The unilateral ventriculomegaly accounts for approximately 50 to 60 percent of cases. However, familial unilateral cerebral ventriculomegaly is a rare condition previously observed only in a few reports. Possible autosomal dominant mode of inheritance was described only in one case.

**Summary.** The diagnosis of fetal malformation and careful review of family history may lead to defining otherwise unknown familial diseases or conditions.

## TREATMENT OF AN INFECTED NONUNITED SUBTROCHANTERIC FRACTURE: A CASE REPORT

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**Keywords.** Subtrochanteric fracture, nonunion, reosteosynthesis, deep infection.

**Introduction.** Treatment of subtrochanteric fractures is still a great challenge. Intramedullary nailing is method of choice for subtrochanteric fractures, long locking plate or dynamic condylar screw can be used in selected cases.

**Case report description.** Patient, female 59 years old, sustained a right subtrochanteric femoral fracture following a domestic fall. Initial treatment in the regional hospital: osteosynthesis with Dynamic hip screw (DHS). After 5 and 11 months reosteosynthesis and re-reosteosynthesis with DHS were performed because of implant breakage and displacement. After 27 months reosteosynthesis with intramedullary nail and bone grafting was made due to the last DHS plate fracture.

Nonunion was observed and patient was admitted to the Hospital of Traumatology and Orthopaedics with suspicion of deep infection. Surgical treatment in two stages was performed.

In first stage removal of intramedullary nail and resection of the pseudarthrosis was performed. Bone canal was reamed and antibiotic-loaded bone cement nail was inserted. Additional external fixation was used. Antibiotic therapy was used.

After 21 days, the second operation was performed. External fixation device and bone cement were removed. The anterolateral cortex and femoral neck defects were filled with nonvascularised fibula autograft. Osteosynthesis with long trochanteric femur plate was done. Patient discharged 14 days after second operation. Unfortunately, after 6 months avascular necrosis of femoral head was diagnosed. Total hip joint arthroplasty is planned.

The patient with infected nonunited subtrochanteric fracture was treated according to two stages surgery approach. Early result seemed very promising, but after 6 months avascular necrosis of the femoral head developed.

**Conclusion.** Dynamic hip screw is fixation option for stable pertrochanteric fractures of the femur and must not be used for subtrochanteric fractures.

**Summary.** The treatment of infected nonunited subtrochanteric fractures with bone defects is challenging, outcomes of joint preservation operations are overall poor.

## RENDU-OSLER-WEBER SYNDROME: THE DANGEROUSNESS OF VASCULAR MALFORMATIONS

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**Keywords.** Rendu-Osler-Weber syndrome; pulmonary arteriovenous malformations; abscess

**Introduction.** Rendu-Osler-Weber syndrome (ROWS) is a rare autosomal dominant genetic disorder that leads to abnormal vasculature formation in the skin, mucosa and organs. Pulmonary arteriovenous malformations (PAVMs) may cause paradoxical embolism to the brain.

**Case description.** A 51-year-old woman complained to the author about week-long blurred vision. Medical history – AH, Hashimoto's thyroiditis and bilateral PAVMs. On examination, the temperature was 37.8 °C, HR 110 bpm, BP 135/70 mmHg, and the SpO<sub>2</sub> was 88% while breathing ambient air; GCS – 15 points. There was pain in the anterior aspect of the left proximal forearm with a visible enlargement. Neurologically – homonymous hemianopia, referred to PSCUH. Ophthalmologically – no pathology. Head MR-angiography showed a hyperintense lesion on FLAIR and T2-weighted images (2.5 x 3 cm) with a hypointense zone around it on T1-weighted image (the right temporal lobe's internal capsule's crus posterior continuing to the thalamus) – with the utmost probability signs of abscess. Additionally, an aneurysm of the right ICA's syphon's supraclinoid part (3 x 3.5 mm) was found. Preoperative lung CTA showed a big left-sided varicose PAVM, 15 mm in diameter, and several various-sized bilateral PAVMs. Intravenous antibiotics were started. US of the left hand revealed phlegmon, drainage was performed; discharge on trimethoprim/sulfamethoxazole (430 mg BID), no improvement. The neurological status worsened – admission and abscess drainage. Negative cultures. Dramatic improvement. The vision defect persists.

**Conclusions.** The neurological symptoms were caused by the abscess caused by paradoxical septic emboli. The infection's source – possibly the phlegmon. ROWS is suspected, because 2 of 4 Curaçao's diagnostic criteria (CDC) are met – skin telangiectasias and organ vascular lesions are present. Aneurysm – possibly ROWS-associated.

**Summary.** ROWS, although is a rare clinical entity, should be considered in adult patients presenting with symptoms of cerebral abscess/ischaemic infarction without an obvious source of infection/emboli and migration path to the brain. Two options were advised: excision of the varicose lesion and embolotherapy for smaller lesions. Diagnosis: meeting CDC and genetical testing. The best treatment for an intracranial abscess is neurosurgery, not antibiotics. Early diagnosis of ROWS is necessary, enabling the investigation/treatment of PAVMs, preventing neurological consequences.

## POSTPARTUM PULMONARY EMBOLISM TREATED WITH ECMO

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**Keywords.** Pulmonary embolism, ECMO, intensive care unit (ICU).

**Introduction.** Pulmonary embolism (PE) is the leading cause of mortality during pregnancy and the puerperium. The possible fatal course of PE shows this clinical report – the patient had sudden massive embolism, resulting in severe complications and the need of resuscitation.

**Case report description.** Young female few hours after caesarean section presented with general weakness, tachycardia, chest pain and was transferred to emergency room. After 2 hours more, the patient's condition has worsened with hypotension (80/51mmHg), became hemodynamically unstable, respiratory rate 35times/min. Computed tomography showed signs of massive pulmonary embolism with huge thrombus in the right main pulmonary artery. Cardiorespiratory failure was observed (PaO<sub>2</sub> 34mmHg, PaCO<sub>2</sub> 24mmHg, saturation 60%) and intubation, artificial ventilation were performed. Extracorporeal membrane oxygenation (ECMO) was preferred as an alternative treatment rather than thrombolysis. During cannulation asystole was observed, 5 cycles of resuscitation was performed. Veno-arterial-venous ECMO was established into right a.femoralis, right v.femoralis and left v. jugularis interna. V-a-v ECMO was also used to treat upper body hypoxemia. Blood test determined D-dimers >4000mcg/l, Troponin I 62641,5ng/l, WBC (\*10e9/l) 30,58. Calculated Apache II score was 27 with 60,5% risk of mortality. On the 4th day cardiac tamponade with heart compression developed, 1000 ml of blood was drained. On the 10th day the v-a-v- ECMO system was removed. On the 11th day patient had failed extubation because of insufficient breathing and low muscle tone. Also, sensorimotor aphasia was recognized. According to signs in computed tomography and MRI, a diagnosis of posterior reversible encephalopathy syndrome with intracranial haemorrhage was considered.

On the 25th day the patient was transferred from ICU department and became fully cooperative on the 40th day.

**Conclusion.** ECMO with anticoagulative therapy could be alternative to standard pulmonary embolism treatment during pregnancy and the postpartum period.

## 4 YEARS AND 6 MONTHS OLD GIRL WITH PATAU SYNDROME: A CASE REPORT

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**Keywords.** Patau syndrome, full trisomy 13, diseases, development, vaccination.

**Introduction.** Patau syndrome is a rare genetical disorder caused by having an extra copy of chromosome 13 in some or all of the body's cells. Only ~5-10% of children live past 1 year but have a severe intellectual disability and physical abnormalities. Hence a description offers an insight into the acquired health care experience for a child with Patau syndrome.

**Case report description.** Girl's weight is 13.7 kg (SD -1.5), height ~100 cm (SD -0.5) - calculated by indirect measurement.

Born at 38 gestation weeks without complications (2nd child from 5th pregnancy) and her weight was 3.020 kg, height - 52 cm, chest size - 32 cm, head size - 34 cm, APGAR 9/9 but due to multiple developmental anomalies chromosomal investigation was made (full trisomy 13). Developmental achievements/ delays: all teeth are presented, the girl is able to lay, sit with somebody's support, hold head, reach and take toys, smile with a response, look at distance 50-60 cm and has no feeding difficulties, however, she cannot walk and says only inarticulate sounds. Diseases related to syndrome: ASD, VSD, congenital cataract, glaucoma, corneal opacities, iris coloboma, microphthalmia, symptomatic epilepsy, kidney polycystosis, reflux nephropathy, HUTI, hypothyreosis, hypotonia. Due to diseases child has nonperiodic seizures, apnea for ~30 s, scoliosis, a necessity of catheterisation 3-4x per day, palliative care, continuous medication therapy, dynamic doctor observation and blood testing, appropriate equipment, caregiver 24/7. Vaccination is done according to vaccination calendar.

**Conclusion.** The severe condition requires appropriate medical specialists' observation and support, wheelchair, scoliosis support corset, effective palliative care and advancement/ education programs to sustain and ease life for a child and her parents. These requirements should be received in time for better results and against deterioration but unfortunately, it takes a long period to get many of them.

**Summary.** The girl was born with normal growth ranges and no complications but with multiple developmental anomalies due to Patau syndrome. Despite little chance to live past 1 year, she has reached the age of 4 years and 6 months and is still having some developmental achievements. However, her severe condition requires a multidisciplinary team who can support and care for a child with congenital anomalies.

## THE DIAGNOSTICS AND MANAGEMENT OF A PATIENT WITH ENDOMETRIOSIS: A CASE REPORT

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**Keywords.** Endometrioma, dysmenorrhea, laparoscopic surgery, infertility.

**Introduction.** Endometriosis is an estrogen-dependent chronic and recurrent inflammatory disease characterized by ectopic growth of endometrial stroma and glands. The main clinical features are dysmenorrhea, chronic pelvic pain and infertility.

**Case report description.** The patient was a 24-year-old female with 12-month history of pain in the lower abdomen, bloating, dyshesia, dysmenorrhea, dyspareunia. Diagnosis was proven in a transvaginal ultrasound on January 2018 - left ovary endometrioma, 6 cm in diameter. Because of symptoms worsening patient was admitted to gynecologist office and operated on 28.11.2018. Manipulations performed were : Laparoscopy. Enucleatio cystomatis ovarii sinistra. Drainage cavi abdominis.

Laparoscopic findings were left ovarium endometrioma 10 cm in diameter, sites of endometriosis in fundus uteri and in plica vesica uteria region. Right ovarium with small hemorrhagic inclusions, without endometriomas, Falloopian tubes permeable. Biological material from surgery site was sent to histological laboratory. Control ultrasound for abdomen and retroperitoneal space was performed and no pathology was noticed. Histological conclusion (03.12.2018) : Ovary endometroid cyst, paratubular serous cyst.

Findings in MRI: cystic tumor in pelvis, dorsal and left from uterus, hyperintense on T1 and T1 fat sat images, on T2 images there is a fluid-fluid level with hypointense signal. The cyst contains some T2 hypointense nodules, without diffusion restriction and with no visible contrast enhancement after intravenous contrast injection on subtraction images.

**Conclusion.** Patient was discharged 1 day after the surgery with recommendations to continue the therapy in outpatient care. No specific treatment for endometriosis is indicated. Further medication tactic depends on patient's reproductive desires.

**Summary.** Endometrioma should be included in the differential diagnosis in patients presenting with pain in the lower abdomen and dysmenorrhea. MRI is the imaging modality of choice. Surgical excision remains the treatment of choice and is curative in majority of cases.

## 1 YEAR OLD GIRL WITHOUT NEUROLOGICAL AND STRUCTURAL HEART PATHOLOGY PRESENTING WITH SINUS PAUSES LASTING UP TO 22 SECONDS

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**Keywords.** Sick Sinus Syndrome, syncope, seizure, sinus pause.

**Introduction.** Sick Sinus Syndrome (SSS) mostly affects people above age of 70 with comorbidities. Rarely patients are children and SSS is related to congenital heart disease. Diagnosis is made based on ECG findings that correlate with symptoms such as shortness of breath, palpitations, dizziness, syncope etc.

**Case report description.** 1 year old girl is stationised after having a seizure. The child was crying and it progressed to loss of consciousness, cyanosis and seizure continued as twitching of arms and legs. Such episodes have been happening for the last 3 months. First seizure happened after a fall, but following seizures happen when child is excessively crying.

Examination approved psychomotor development according to age. Blood tests were normal.

ECG showed sinus arrhythmia 129-146 bpm (child was crying during examination). EchoKG examination excluded congenital heart disease, valve pathology and myocardial damage. EEG examination didn't show convincing data of epilepsy. Clinical diagnosis was breath inhibiting seizures with loss of consciousness. Control by clinical indications is suggested.

After 3 months girl is admitted to hospital again for examination in neurology department. Seizures are happening more often and they are prolonged. Patients mother marks, that it takes longer to contact child again after seizures.

Neurological examination and MRI of head showed no pathology.

Cardiological examination was repeated and Holter monitoring revealed sinus pauses in association with seizure, cramps. The longest sinus pause was 22 seconds (others were 13 and 11) which is an indication for electro-cardio-stimulator implantation (ECS). Afterwards patient was admitted to cardiology department and seizures haven't happened since ECS implantation.

**Conclusion.** SSS symptoms may be hard to distinguish in pediatric practice, because disease manifests in different ways. Even though neurological examination is without pathology, seizure investigation with Holter monitoring was the key to diagnosis.

**Summary.** Case presents a 1 year old having seizures with cramps and inability to breathe without neurological pathology or congenital heart pathology. Seizures get worse with time, so various examinations are performed. Holter monitoring reveals sinus pauses up to 22 seconds in association with seizures, so ECS implantation is required. After ECS implantation seizures haven't repeated.

## CALCIFIED SUBDURAL HEMATOMA AS A LONG-TERM OUTCOME OF SHUNTED CONGENITAL HYDROCEPHALUS IN A YOUNG WOMAN – CLINICAL CASE REPORT

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**Keywords.** Calcification, subdural hematoma, craniotomy.

**Introduction.** Calcified subdural hematoma (CSH) is a rare, well-known condition predominantly occurring after minor head trauma (Hacıyakupoğlu et al., 2017). CSH represents 0.3 – 2.7% of chronic subdural hematomas (Pruna V et al., 2010). Due to the slow cortical adaptation neurological deficit does not develop, resulting in misdiagnostics and mistreatment of this condition (Ducruet AF et al., 2012).

**Case report description.** A 34-year-old woman with anamnesis of ventriculoperitoneal shunting operation due to CH was planned for a neurosurgical treatment. The main complaints included severe, progressive tension type headache. Physical examination findings were without neurological deficit. Brain magnetic resonance imaging (MRI) and computed tomography (CT) were performed revealing a formation with signs of calcification in the subdural space of the left hemisphere of the brain. Left frontotemporoparietal craniotomy was performed with total excision of CSH. The CSH histological findings included cancellous osteoma with fatty bone marrow. Early postoperative period occurred without complications, Glasgow Coma Scale – 15. The operation wound was primarily closed. Patient was discharged 7 days after neurosurgical treatment in a good overall health condition.

**Conclusion.** CSH are rare entities frequently developing as a complication after shunting operation due to CH. CSH are well tolerated because of their indolent nature. Radiological findings might be impressive without direct clinical correlation. Surgical treatment proves success in a positive long-term outcome for the patient.

**Summary.** The case of 34-year-old woman with anamnesis of shunted CH and performed neurosurgical treatment with total excision of CSH was presented. Patient's complaints included progressive tension type headache. Radiological findings revealed a calcified formation in the subdural space of the left hemisphere of the brain. Patient was discharged 7 days after neurosurgical treatment. Detailed headache assessment and distinguished surgical treatment is necessary and viable proving success in patient recovery and positive long-term outcome.

## FATAL METFORMIN POISONING

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**Keywords.** Metformin, intensive care unit (ICU), hypoglycemia.

**Introduction.** In patients with diabetes mellitus biguanides are antihyperglycemic agents, they promote euglycemia but in combination with hypoglycemic drugs are likely to cause hypoglycemia. Metformin is the principal biguanide in clinical use. The fatal course of metformin is showed in this clinical report presenting the metformin overdose and hypoglycaemia.

**Case report description.** 76-year-old female who had nervus abducens paresis was transferred to Ophthalmology department. She had a history of diabetes mellitus for 15 years. For treatment she had Glimepiridum 4mg and Metformin 850mg 3 times a day. The second day arterial blood gases revealed critical hypoglycemia 1,72mmol/l and metabolic acidosis pH 7,010, pCO<sub>2</sub> 24,1, HCO<sub>3</sub> 5,8, severe lactic acidemia – serum lactate level increased up to 29mmol/l. The patient was agitated and slightly confused. After console, metformin-associated lactic acidosis and electrolyte imbalance (hyperkalemia 8,3mmol/l and hyponatremia 129mmol/l) were diagnosed and patient was admitted to an ICU. Acute kidney failure was observed. After few hours impaired consciousness was diagnosed. A patient was hemodynamically unstable. In dynamic pH level increased to 7,3, potassium and natrium level rationed. Though blood test showed slow positive dynamics. The patient's condition complicated by pneumonia and septic shock. Despite treatment on the 5th day the patient deteriorated, and cardiorespiratory failure was observed with 20minutes of cardiopulmonary resuscitation. The last set of laboratory results were carried out one hour prior to death. They showed a serum lactate level still 12.7 mmol/L, bicarbonate 15 mmol/L, pO<sub>2</sub> 37,8mmHg and pCO<sub>2</sub> 27,1 mmHg in arterial blood. The prognosis in cases of metformin overdose and undifferentiated lactic acidosis is poor, with an expected case-fatality rate of 30–50%.

**Conclusion.** Overdoses with metformin are relatively uncommon but may have serious consequences. Although metformin does not directly lower glucose levels, metformin-associated hypoglycemia has been reported with metformin overdoses.

## COMBINED SEVERE POLITRAUMA: A CASE REPORT

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**Keywords.** Polytrauma, Head injury, Diffuse axonal injury, Craniofacial trauma, ER management.

**Introduction.** According to CDPC, trauma is fourth most common cause of death. One in 12 hospital admissions in the EU is related to trauma. Overall, of 5.4 million hospitalized patients in EU countries 238,000 are related to injury. The average number of listed head injuries for the last five analyzed years in Latvia is 3030,4, with a tendency to increase.

**Case report description.** Male, 50 years, polytrauma at work. Transferred from other hospital with external fixation apparatus of the average 1/3 fracture of left humerus, intubated, sedated, analgesia, artificial lung ventilation. Locally massive lesions of facial skin, soft tissues, situation stitches.

CT examination: multiple facial bones fractures with dislocation. Left eye eyeball hematoma. Subdural and epidural hematoma above left frontal and subdural on the left temporal lobe. Detailed hemorrhagic contusion bullet on the right forehead lobe and cerebellar hemisphere. Bone fractures of the skull vault and forehead. Left temporomandibular joint luxation. Operation – facial wound revision, bone fragments removal, maxillar and mandibular osteosynthesis. Revision of left mandibular collum, removal of splinters, jaw joint removal.

Snip of conjunctiva and perforating sclera sewing suture. Treffination on Koher point and input of ICP sensor.

**Conclusion.** Within 4 months appeared fistula in the right lower jaw area with a purulent discharge, where repeated plastic of the lower lip was used. Full consolidation of mandibula was achieved in 14 months. This case confirms that patient compliance is a determining factor in the recovery process. Despite the large number of medications and manipulations, the patient hasn't been hospitalized for 2 years and has adapted to living conditions.

**Summary.** Severe polytrauma with brain damage, multiple facial bone fractures, eye injury, limb fracture, critical condition. Large number of medications, manipulations and complete recovery within 14 months.

## POST-THROMBOTIC SYNDROME FOLLOWING PEDIATRIC VENOUS THROMBOEMBOLISM

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**Keywords.** Post-thrombotic syndrome, deep venous, antithrombin deficiency, ulcer.

**Introduction.** Post-thrombotic syndrome (PTS) has been increasingly recognized as a serious complication of deep venous thrombosis (DVT). There is a lack of published evidence on the underlying mechanisms, natural history, prognostic factors and management of this complication. Our clinical report shows PTS following pediatric-onset DVT resulting in significant and long-term morbidity.

**Case report description.** 12-year-old boy presented with a swollen, painful left leg and fever. Imaging revealed signs of inferior vena cava thrombosis, the presence of interrupted intrahepatic IVC with azygos continuation and bilateral iliofemoral thrombosis with enlargement of the azygos and hemiazygos venous system. Thrombophilia screening showed decreased AT activity and SERPINC1 gene analysis revealed a homozygous mutation causing type IIB deficiency. The patient was treated with warfarin for the past 4 years. In addition, compression therapy was recommended for the rest of his life. After 3 years of treatment severe post-thrombotic syndrome was diagnosed. The patient had pain in left lower limb and common symptoms as dermatitis, swelling, dilated superficial vessels and trophic ulcers were observed. Microbiologic tests showed *Staphylococcus aureus* MRSA growing from the ulcer. Ulcer was covered with Mepilex Border dressing and improved. After few months the ulcer deteriorated with thick rim of fibrous tissue around the ulcer edges, the skin was hard and painful. Repeated cycles of ulceration, healing and recurrence are common resulting in significant morbidity and poor quality of life. As children are expected to live several decades dealing with DVT-related complications, the development of PTS following pediatric-onset VTE may result in a disproportionately higher physical, psychosocial and financial burden than that seen in adult population.

**Conclusion.** Presented severe pediatric PTS case highlights the need for research aimed at improving our understanding of the natural history, unknown risk and prognostic factors associated with pediatric PTS.

## POSTPARTUM PUBIC SYMPHYSIS DIASTASIS: TWO CLINICAL CASES AND COMPARISON OF CONSERVATIVE AND SURGICAL TREATMENT

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**Keywords.** Symphysis pubis diastasis, Conservative treatment, Internal pubic synthesis.

**Introduction.** Widening of the pubic joint of more than 10 millimetres is diagnostic and defined as the pubic symphysis diastasis and considered a complication of the vaginal childbirth method or pregnancy. As it is a rare pathology (from 1 in 300 to 1 in 30,000 pregnancies), no gold standard treatment is defined.

**Case report description.** The study examines two clinical cases of a 27-year-old patient (gravida 1, para 1) and a 28-year-old patient (gravida 1, para 1) presented to the clinics after uneventful vaginal deliveries. Both patients had a normal pregnancy with no complaints. A severe pain in the pubic region occurred after labour and was accompanied by complicated locomotion. Pubic symphysis diastasis was confirmed radiologically and bed rest with lateral decubitus positioning was recommended. Oral NSAIDs for pain exacerbations were administered. The complaints reduced. In the first case post-treatment MRI scan showed the reduction of symphyseal separation with no signs of osteitis. Three years later the symptoms reoccurred; MRI examination showed no further symphyseal widening or signs of osteitis. The relapse of symphyseal separation was diagnosed and conservative treatment was readministered that resulted in successful recovery. In the second case pain reoccurred 3 months after the conservative treatment. Symphyseal separation with aggravating osteitis was confirmed radiologically. The surgical treatment was chosen and the internal pubic synthesis was performed. However, after several months a fistula in the scar location appeared and an X-ray showed several loose screws. The fixating plate removal was performed. The postoperative period went well without complaints or radiological signs of the skeletal instability or infection.

**Conclusion.** Taking into account that the standardisation for the conservative and surgical treatment or studies of possible complications have not been defined, we reveal a high risk of postoperative infections that are likely to complicate surgical treatment.

## HAILEY – HAILEY DISEASE. COMBINED THERAPY CASE REPORT

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**Keywords.** Genetic diseases, rare diseases, HHD, ATP2C1 gene.

**Introduction.** Hailey – Hailey disease (HHD) is a rare genetic skin disorder, that affects both genders equally and occurs in 1 out of 50,000 of the general population. This disease manifests itself as blistering and erosions, which is caused by mutations in the ATP2C1 gene, inherited in an autosomally dominant manner or associated with a new mutation in the gene. ATP2C1 encodes a protein that is most active in keratinocytes. Intracellularly it acts as a calcium and magnesium pump by pumping these ions into the Golgi apparatus. If the calcium pump is incorrectly operated, cell-to-cell adhesion is impaired and acantholysis occurs.

**Case report description.** Case description. 48 years old male had complaints about burning skin ulceration, erosion and vesicles followed by rupture of blisters in his armpits, behind ears and on the lips. First symptoms appeared in 2018 with a tendency to expand in size, quantity. Skin biopsy was done in Germany (acantolytic dermatosis, Hailey-Hailey disease). Blood biochemistry analyses did not show any changes. Microbiological cultures: *Candida albicans* – positive. US imaging proved diffuse liver parenchymal damage, fatty hepatosis. Patient is under treatment: topical corticosteroid and antibiotic cream, as well as, oral methotrexate. Laser ablation therapy (CO<sub>2</sub>) is administrated.

**Conclusion.** Based on the information gathered in the Human Phenotype Ontology database, each HHD patient may have different combination of symptoms and their manifestations may variate. Combined therapy with topical steroid composition, antibacterial and moisturizers with laser ablative therapy showed good results.

**Summary.** HHD therapy is non-specific, it is determined by taking into account each individual symptoms and severity, with purpose to decrease and eliminate further recurrence. Early and correctly performed diagnostics play a major role in effective treatment – by taking a biopsy to accurately detect skin dermatosis and with HHD mostly associated disease check-up.

## EXTENSIVE VENOUS ABNORMALITIES

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**Keywords.** Vascular anomalies, vascular malformations, lower limb, skin defect.

**Introduction.** Vascular lesions, including vascular neoplasms and vascular malformations, are common in newborns. Although the majority of these lesions are benign and self-limited conditions, some may be part of complex syndromes or systemic disorders or may be associated with complications. Diagnoses can often be determined by incorporating the history, physical examination, imaging and chronological course.

**Case report description.** Newborn was born at 40 weeks of gestation, birth weight 3378g., length 53 cm., head circumference 33cm. Apgar score was 9/10. During the first examination an extensive uneven surfaced, pigmented wound-like malformation (10x20cm) on left lower extremity with huge sprouts was found. MRI detailed that congenital malformation is vascular, starts from lower third of left thigh (5 mm diameter), goes by lateral side of the thigh, rotates to the front (diameter there is about 7,5mm) there are visual nodes of anomalous venous (diameter 8 mm) with possible thrombosis. In addition, MRI showed blood flow from v.saphena to abnormal venal nodes. No visual signs of v.femoralis sinistra were noticed. After a week an ultrasound proved a deep venous existence. This polyetiological abnormality consist of venous, lymphic, capillary disfunctions and minor arteriovenous variance. Though, no arteriovenous fistula was detected. For treatment compression therapy was recommended. After few months of this treatment slight positive dynamics was observed.

**Conclusion.** Although the exact cause of these lesions is unknown, they are thought to be caused by errors in the formation and development of veins, arteries and lymphatic system during fetal development. A deficiency of smooth muscle cells in the vessels walls is known to be an important factor.

**Summary.** As children are expected to live several decades dealing with this abnormality and all associated complications and this case highlights the need of research to improve early diagnostics and optimal treatment.

## PATIENT WITH SUSPICIOUS VAGINAL APLASIA: A CASE REPORT

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**Keywords.** Partial vaginal aplasia, congenital disorder, colporrhaphy.

**Introduction.** Vaginal aplasia is a congenital affection characterized by the absence of the vagina. Isolated vaginal aplasia is an extremely rare developmental disorder, with a reported frequency of 1 in 4000 – 1 in 10500 female births. In 10% of cases, vaginal aplasia is associated with a normal development of the uterus and the endometrium. Usually, vaginal aplasia is partial and the distal, medial or cranial third is affected. Patients with a simple vaginal aplasia complain usually from cyclic pelvic pain and menstrual retention. The management of this rare anomaly is based on surgery to allow a normal sexual life for patient and to restore the fertility prognosis.

**Case report description.** A 19-year-old girl admitted for a gynaecologist consultation with complaints of inability to live sexual life and slight pain beneath belly. Menarche occurred at 14 years of age, and her menstrual cycles had been regular and painless. The gynaecological examination under intravenous anesthesia revealed suspicious vaginal aplasia and menstrual blood. Further the patient was examined during menstruation. Menstrual blood flowed out of the paraurethral openings, explained the patient's history of menstrual bleeding without pain. The patient did not have any other health problems. The patient's secondary sexual characters were well developed.

Transabdominal, transrectal and gynaecologic ultrasonography were performed. Cystoscopy and ureteroscopy revealed no urethral or urine bladder changes, possible urethral diverticules or urethral and vaginal fistulas. MRI scan of the small pelvis was done by expert radiologist with an expertise in gynaecology to check the presence of gynaecological pathology and to know more details enabling choice of the appropriate surgical technique: the vagina ended blindly 2.5 cm above the perineum and about 1.0 cm away from the rectum. These measurements helped surgeons choose the right steps for the tactics of surgery. After confirmation of diagnosis, vaginal opening, anterior and posterior colporrhaphy were performed under direct rectoscopy control and presence of proctologist.

**Conclusion.** Three weeks after surgery patient was allowed to start a sexual life. The last gynaecological check-up including bimanual-vaginal and rectal examination, transvaginal ultrasound and Pap smear test were without any abnormalities.

**Summary.** It is a very rare condition when the patient have normal menstrual bleeding through paraurethral openings without clinical findings of hematometra and hematocolpos.

## GIANT GASTRIC GIST – STILL A SOPHISTICATED TARGET IN DIAGNOSTICS

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**Keywords.** GIST, biopsy, leiomyoma, differential diagnosis, diagnostic controversies.

**Introduction.** Gastrointestinal stromal tumour (GIST) is the most frequent mesenchymal neoplasm of the digestive tract. Because of peculiarities in prognosis and treatment, it must be promptly distinguished from other tumours. The aim of our report is to highlight the difficulties in the diagnostics of GIST in order to improve patient care.

**Case report description.** A 79-year-old lady was urgently admitted to hospital because of acute abdominal pain; diverticulitis or ileus was suspected. Eight months earlier, the patient already underwent upper digestive endoscopy (UDE) because of epigastric pain. Although large ulcerated submucosal mural mass was seen in gastric wall, benign leiomyoma was reported in the biopsy. The patient was scheduled for a planned operation. During the current admission, abdominal computed tomography showed a gastric mass measuring 10 cm, and intraperitoneal fluid in the upper part of abdominal cavity. Repeated UDE showed ulcerated, irregular submucosal mural tumour in the proximal part of posterior gastric wall. Lung fibrosis was noted by chest X-ray. Considering endoscopic findings, sectoral gastric resection via median superior laparotomy approach was performed. In the removed gastric fragment, a mass measuring 16x10 cm was found. Histology disclosed high-grade GIST. The immediate postoperative period was uneventful. The patient was discharged on 9th postoperative day.

**Conclusion.** Although biopsy is the gold standard of tumour diagnostics, occasionally it can yield wrong diagnosis suggesting more beneficial prognosis. Such mistake can arise if normal tissue components in a superficial biopsy are misinterpreted as being representative of the pathology. This can lead to suboptimal treatment schedule, especially in conditions of long waiting list for planned surgery. Wider awareness about GISTs, as well as the limits and errors of biopsy interpretation is necessary. Education and collaboration in medicine is of utmost importance to see disease and patient in the entirety.

**Summary.** This report is about an old lady who was urgently admitted to the hospital because of the acute abdominal pain. Eight months prior to that benign leiomyoma was reported. Gastric leiomyomas are rare benign mesenchymal tumors, usually asymptomatic. During the current admission, using laboratory, morphological and immunohistochemical findings, gastrointestinal stromal tumor was diagnosed. Gastrointestinal stromal tumour (GIST) is the most frequent mesenchymal neoplasm of the digestive tract. Because of the peculiarities in prognosis and treatment, it must be promptly distinguished from other tumours.

## FIRST TIME THORACOSCOPY APPROACH IN NEWBORN WITH ESOPHAGEAL ATRESIA WITHOUT TRACHEOESOPHAGEAL FISTULA

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**Keywords.** Esophageal atresia, thoracoscopy

**Introduction.** Esophageal atresia (EA) is related to abnormal differentiation of gastrointestinal and respiratory tracts in embryonal development with incidence 1 to 3500 births. In most cases esophageal atresia presents with distal tracheoesophageal fistula, only in around 8% isolated EA is seen.

**Case report description.** A newborn patient, 41+6 gestational week, weight 2680 g, shortly after birth presented with excessive drooling and inability to pass feeding tube into the stomach. EA was diagnosed. X-ray and fibrobronchoscopy approved EA without fistula.

Further tactics included NICU settings, oesophageal tube for suction, and gastrostomy tube for early enteral feeding thus promoting weight gain and awaiting spontaneous growth of proximal and distal esophageal segments for better anastomosis to be made afterwards.

Delayed primary repair with anastomosis was made at age of 1 month 11 days. First time in Children's Clinical University Hospital (CCUH) surgical approach included thoracoscopy in case of EA with the aim for better visualization and mobilization of esophageal pouches followed by open thoracotomy to make anastomosis.

In the 5th postoperative day anastomotic leakage was observed. 17 days after surgery contrast medium approved esophageal anastomosis to be healed up and peroral feeding was started.

**Conclusion.** Tactics in rare case of isolated EA includes delayed primary repair. Open procedure is standard, however thoracoscopic approach is gaining popularity. For the first time thoracoscopic surgery as a method was chosen in baby only one month old for better visualization of proximal and distal esophageal pouches. After successful mobilization of esophageal pouches anastomosis was made during open procedure.

**Summary.** A newborn with rare type of esophageal atresia was transferred to CCUH for further surgical interventions. Surgery consisted of thoracoscopy and thoracotomy. Esophageal anastomosis was made and peroral feeding made feasible.

## PATIENT WITH COLORECTAL CANCER AND MULTIPLE PERITONEAL METASTASES AFTER THE FIRST SUCCESSFUL HIPEC PROCEDURE IN LATVIA

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**Keywords.** Colorectal cancer, HIPEC.

**Introduction.** Colorectal cancer (CRC) is the third most commonly diagnosed cancer worldwide with the incidence growing due to several factors. Despite the increasing incidence of CRC, the death rate has been decreasing for several decades. Patients treated with cytoreductive surgery (CRS) + hyperthermic intraperitoneal chemotherapy (HIPEC) are able to achieve a median survival of more than 60 months, whereas the median survival in the palliative setting does not exceed 1 year.

**Case report description.** A 56-year old male, with long term complaints, was diagnosed with right sided CRC stage IV with 3 metastases in lesser pelvis in July, 2012. During laparotomy (07.2012) right hemicolectomy with ileotransverse anastomosis and excision of metastases was done. After surgery patient received chemotherapy (FOLFOX x 11). After a year (05.2013) CT scan revealed 2,5cm/Æ node near the ileotransverse anastomosis what was an indication for laparotomy. During laparotomy (06.2013) 3 abnormal nodes were excised. As one node was in region of anastomosis, surgeons resected ileotransverse anastomosis with the node and made a new side-to-side ileotransverse anastomosis. Patient received chemotherapy (FOLFIRI x4). In May, 2014 CT scan revealed new metastases. During laparotomy surgeons excised metastases. Patient received chemotherapy (FOLFIRI). 11.2015 and 01.2017 laparotomy was done to remove metastases. Patient continued to receive chemotherapy. In July, 2018 cytoreductive surgery (total peritonectomy, rectosigmoidal, ileotransverse anastomosis, right ureter resections) with HIPEC was done.

**Conclusion.** This was the first successful HIPEC procedure in Latvia on a patient with CRC and multiple peritoneal metastases.

**Summary.** CRC is the third most commonly diagnosed cancer worldwide. The patient was diagnosed with right sided CRC in July, 2012. From 2012–2018 the patient has had 5 laparotomies and received chemotherapy. In July, 2018 patient received CRC + HIPEC and it was the first successful procedure in Latvia.

## CAT-SCRATCH DISEASE WITH OSTEOLYTIC LESION

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**Keywords.** Cat-scratch disease.

**Introduction.** Cat-scratch disease is a rare zoonotic disease caused by *B. henselae*, whose mammal reservoir species is *Ctenocephalides felis*. Transmission to humans occurs via scratches and bites.

**Case report description.** 13-year-old female was admitted to surgical department in Children's Clinical University Hospital with enlarged lymph nodes for 3 weeks, back pain for 3 days. No complaints about fever, precipitation, weight-loss.

Lymph node ultrasonography examination found enlarged lymph nodes in right axillar, right inguinal and femoral regions where all of them are hypoechoic hypervascularized without destruction signs. CT scan of thorax showed multiple enlarged lymph nodes in axillar region 1.5-2cm, multiple tiny subpleural solitary nodules(3-4mm). Whole-body MRI showed increased intensity in 10th thoracic vertebrae, which requires further examination with thoracic MRI of the spine. Thoracic MRI of the spine showed isolated hypointense lytic mass(~8mm) in the body of 10th thoracic vertebrae. Contrast gathering peripheral part of the mass with unclear margin, what might suggest metastasis or primary bone tumor. Patient continued to complain of intolerable, persistent back pain. Haemato-Oncologist suspected lymphoproliferative disease; performed bone marrow biopsy revealed non-specific reactive changes with the one epithelioid cell granuloma. Finally, conclusion of lymph node biopsy was obtained with the finding of specific absceding granulomatous lymphadenitis. In combination with additional anamnesis data on history of a new cat in the household and scratch marks patient had before, diagnosis of Cat-scratch disease was done. Doxycycline plus trimethorprim-sulfamethoxazole course was administered.

**Conclusion.** Lytic bone involvement represents a very rare and atypical manifestation of Cat-scratch disease; it has been described previously in small number of patients. The case illustrates the importance of medical history and necessity to consider unusual spreading of infection even when there are no other signs of systemic dissemination.

**Summary.** Report of a pediatric patient with Cat-scratch disease with osteolytic lesion, diagnostic reasoning, positive outcome.

## DA VINCI ROBOTIC PROSTATECTOMY AS A SUPERIOR METHOD OF TREATMENT FOR PROSTATE CANCER

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**Keywords.** Prostate cancer, Da Vinci robotic surgery, robotic prostatectomy.

**Introduction.** Robotic assisted radical prostatectomy (RARP) is believed to be similarly beneficial or even better for the prostate cancer treatment than other surgical methods (Yuefeng Du et al.,2018). According to various studies decreased blood loss and operating time, earlier recovery of urinary continence and erectile function are proven (Chopra et al.,2012). The purpose of this case report is to emphasize increasing value of robotics in urological surgery.

**Case report description.** A 61-year-old man was referred to Urology department of University Hospital in Hradec Kralove, Czech Republic in December 2017 because of elevation of prostatic specific antigen (PSA = 8.273 ng/ml). The histology findings of biopsy performed in January 2018 showed well differentiated adenocarcinoma, initial Gleason score was 6 (3+3). Patient was indicated for RARP. The procedure lasted 120 min, estimated blood loss was 50 ml, the only painkiller used was paracetamol.

Mobilization started 6h after the procedure, the drainage was removed on postoperative day 1, the next day patient was discharged. Urinary catheter was removed on the day 7. Patient was fully continent. The definitive histology finding showed adenocarcinoma of prostate pT2aN0M0R0 - GS6 (3+3). 3 months after procedure, the patient was completely continent, with mild erectile dysfunction and PSA < 0,008 ng/ml.

**Conclusion.** We present a patient with adenocarcinoma of prostate, treated by RARP. Operating time was similar to other methods, but blood loss, hospital stay, painkillers usage, incidence and severity of side effects were significantly lower. By this example we emphasise the increasing meaning of RARP in urological surgery, suggesting this method as beneficial and superior to others.

**Summary.** RARP should be considered as an exclusive alternative to laparoscopic or open procedure for prostate cancer treatment. Considering fast recovery and low incidence of complications, the costs of instruments and Da Vinci system are worth to spare.

## SURGICAL TREATMENT OF MULTIPLE BILATERAL LIVER ALVEOLAR HYDATIDOSIS INVOLVED IN THE COMMON HEPATIC ARTERY

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**Keywords.** Echinococcosis, operative treatment, aorto-hepatic bypass.

**Introduction.** There were 775 echinococcosis cases established in Europe in 2016. Human echinococcosis is a disease caused by tapeworms classified as cestoda and genus echinococcus. Humans are infected occurs by ingestion of the parasite eggs and the parasite then develops into larval stages in the viscera with asymptomatic period of more than 10 years. Cysts were largely found in liver and lungs. They can also grow over 10 cm, what creates serious health problems for the infested.

**Case report description.** A 58 year old man was stationary in the Latvian Oncology Center on January 7th, 2019, what has been caused by multiple cystic masses in the liver, identified on abdominal CT in October of 2018. Patient had a conservative treatment with Albendazol which did not allow the regression of cysts. Abdominal CT has shown that the liver had lesions in the entirety of the left lobe, the 8th segment of the right lobe, as well as common hepatic artery. The Radiology and Oncology Council has made a decision to perform the surgery, that consisted of the extended hemihepatectomie, the resection of the 8th segment and common hepatic artery, which has been replace with aorto-hepatic bypass from the patients great saphenous vein.

**Conclusion.** Echinococcosis is a serious health issue despite the high quality of life in Europe nowadays. The conservative treatment does not provide the necessary outcome, and thus for, the only solution is a radical surgery. The contemporary operative treatment ensures the total removal of the cysts, including the invaded surrounding tissues, as well as the complete structure replacement.

**Summary.** The clinical case introduces that the contemporary operative treatment is the only positive procedure to cure the alveolar echinococcosis despite cysts targeting big vessels and other structures, that are followed by the surgical reconstructions.

## CHRONIC CENTRAL NERVOUS SYSTEM INFECTION IN AN IMMUNOCOMPETENT PATIENT

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**Keywords.** Chronic neuroinfection, chronic meningitis, tuberculosis.

**Introduction.** Central nervous system (CNS) infections are considered chronic when lasting  $\geq 4$  weeks. Although adequate testing is usually done, in more than 30% of cases etiological factor remains unknown.

**Case report description.** A 33-year-old woman presented to the ER with an intense headache and vomiting, after subjective improvement she was discharged. In two days, she returned having similar symptoms and was hospitalised. Her neurological examination on admission revealed a positive Kernig's sign with no other abnormalities. Lumbar puncture (LP) revealed lymphocytic pleocytosis. She displayed no focal neurological symptoms, however, her husband reported that the patient was "not herself" and was reluctant regarding discharge. Head MRI, detailed viral and bacterial screen revealed no pathology. After 13 days in the hospital she had an episode of severe headache and confusion. LP was done and showed pleocytosis. Repeated head MRI showed a granulomatous process. She was tested for rarer causes, including autoimmune antibodies and tuberculosis (TBC) – all negative. She was treated *ex juvantibus*, there was no somatic worsening, although mild cognitive impairment was noted, and her husband repeatedly reported her behavior being bizarre. After the third LP had shown persisting pleocytosis, the patient started to receive antituberculous therapy. The patient showed dramatic improvement. After spending 62 days in the hospital the patient was discharged without neurological disability and no cognitive impairment.

**Conclusion.** This case demonstrates the problematic evaluation, diagnosis and treatment of a chronic CNS infection as well as the importance of high suspicion, which in this case lead to effective therapy. Chronic CNS infections remain a great challenge for experienced specialists worldwide.

**Summary.** A woman with headache, cognitive impairment, but no other neurologic abnormalities proves to have a chronic CNS infection. After profound diagnostic testing and discussion, antituberculous treatment is started and clinical improvement is seen.

## PEDIATRIC PATIENT WITH COMPLICATED ACUTE PETROSITIS: A CASE REPORT

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**Keywords.** Acute petrositis, bacteremia, subdural empyema.

**Introduction.** Acute petrositis is a rare infection with complex diagnostics and treatment. It presents with nonspecific and atypical symptoms that burdens process of diagnostics.

**Case report description.** Patient female 7 years and 10 months admitted to Children's Clinical University Hospital with increasing headache, sleepiness, general fatigue for one month, pain and edema on the left side of her face, fever, photosensitivity. Previously symptoms were associated with high amount of work in school. Acute otitis media with perforation two months ago. Blood analysis showed increased leukocytes, CRO, II-6, D-dimer. CT scan showed chronic left side mastoiditis. MRI investigation indicated left side basal meningeal infiltration and temporal bone petrous part damage. Repeated evaluation of CT scan was performed, petrous part's miniature destruction was found. Treatment with intravenous vancomycin, meropenem and enoxaparin. General state and fever episodes without improvement. Blood culture identified *Streptococcus intermedius* bacteremia. Second MRI scan was performed, right side subdural empyema of temporal and parietal lobes, immediate right side parietal osteoplastic trepanation surgery, drainage of empyema was performed, antibacterial treatment modified from meropenem to cefepime. Patient's general state improved, received continuous treatment with enoxaparin and cefepime. After 2.5 months of hospitalization discharged for further outpatient care.

**Conclusion.** Diagnostics and treatment of patients with acute petrositis might be problematic due to rare incidence and atypical manifestation. Awareness of infectious processes in skull should be followed in order to prevent serious complications in patients with initial nonspecific symptoms.

**Summary.** The presented case highlights the challenges encountered with diagnostics and treatment of 7 years 10 months old female patient with complicated acute petrositis.

## TOXIC SHOCK SYNDROME: A CASE REPORT

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**Keywords.** Streptococcal toxic shock syndrome (STSS), group A streptococcus (GAS), sepsis.

**Introduction.** Toxic shock syndrome (TSS) is a life-threatening complication of an infection with *Staphylococcus aureus*, or less commonly, with *Streptococcus pyogenes*, also referred to as group A streptococcus (GAS). The majority of infections with GAS are associated with low mortality, but in STSS mortality exceeds 50%. GAS produce exotoxins with superantigen activity. Typical for TSS is a rapid progression of severe hypotonia with symptoms of toxemia. Although TSS is most often caused by skin infection, it may spread from an infection anywhere in the body.

**Case report description.** A 6-year-old girl was presented with symptoms of vomiting, diarrhea, dry cough and fever lasting for 24 hours. On admission, the child was drowsy and lethargic. On physical examination tachycardia, tachypnoea, hypotension, poor peripheral perfusion, and slight erythema on her face and armpits were observed. Right after admission, blood samples for culture were collected and the girl was administered broad-spectrum antibiotics, intravenous fluids, corticosteroids, and antipyretics. Laboratory tests showed significantly raised procalcitonin level (522 ng/mL), leukopenia, coagulopathy and renal dysfunction. Hydration and diuretic administration did not reverse oliguria, blood pressure and saturation still dropped. The girl reported dyspnea and due to circulatory failure, she was transferred to the ICU. The child deteriorated despite ventilation therapy, extensive pharmacotherapy, and physical cooling. Arrhythmia with a tendency towards bradycardia developed, followed by cardiac arrest. She died 24 hours after admission. The autopsy study showed brain herniation and extensive lung edema. *Streptococcus pyogenes* was found in blood culture.

**Conclusion.** Despite prompt hospital admission and proper treatment, the progression of TSS may be rapid and life-threatening.

**Summary.** TSS is a rapidly progressing syndrome with poor prognosis. Undoubtedly, more research in this field is required to reduce number of fatal cases.

## CONGENITAL CMV WITH CONGENITAL HIV CO-INFECTION

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**Keywords.** Cytomegalovirus (CMV), human immunodeficiency virus (HIV).

**Introduction.** About 1 % of live newborns have congenital CMV infection. But only 10% of them have symptoms. However, 25 % of newborns with congenital HIV infection have also congenital CMV co-infection. The risk of CMV infection increases without ART as well.

**Case report description.** A girl was born on September 18 of 2018 in Vidzeme hospital. From 5th pregnancy and 5th labour, at 36+5 weeks of gestation. Acute cesarean section was performed due to mother's abdominal trauma and consequent low fetal heartbeats. The baby weighed 2,336 kg with an Apgar score of 5/7/7. After birth bradycardia and irregular breathing were present thus the respiratory support was performed.

It is known that mother is 32 years old, HIV positive, ART started from September 2017. Consumption of alcohol and smoking during pregnancy also was observed.

On 23rd September the baby was admitted to Neonatal intensive care unit at Children's Clinical University Hospital with suspected VCC. Echocardiography did not confirm the VCC. A lumbar puncture was performed due to tremor, agitation and respiratory distress. On 28th September cerebrospinal fluid analysis showed positive CMV DNS. Therefore, a therapy with ganciclovir was initiated. On 1st October an ophthalmologist diagnosed CMV retinitis in the right eye. On 4th October MR investigation confirmed the brain damage. On 16th October a councilium of LIC infectologists prescribed the baby HAART because of high HIV load. On 22nd October the girl was transferred to the common neonatal unit for further therapy.

**Conclusion.** Congenital HIV infection increases the risk of congenital CMV infection. Neurologic symptoms etiology could be both exposure of alcohol during pregnancy and CMV meningitis. Anemia could be a complication of CMV as well as ganciclovir and HAART.

**Summary.** This case report presents several teratogen factors reciprocal interaction, causing similar manifestation.

## SEVERE OUTCOMES OF CONGENITAL TOXOPLASMOSIS: A CASE REPORT

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**Keywords.** Congenital toxoplasmosis, *Toxoplasma gondii*, parasite infection.

**Introduction.** Toxoplasmosis is a globally spread parasitic disease caused by a protozoan *Toxoplasma gondii*. The infestation in immunocompetent individuals is usually mild and self-limiting. However, primary infection during pregnancy may result in a transplacental transmission of the pathogen to developing fetus. Congenital toxoplasmosis (CT) may lead to serious complications, typically involving central nervous system and eyes.

**Case report description.** A 6-week-old infant was admitted to the Neurosurgery Department with symptoms of enlarged head circumference (44 cm; >97 pc) and bulging fontanelle. Computer tomography revealed increased ventriculo-hemispheric ratio and hydrocephalus. As a treatment, the ventricoperitoneal shunt was implanted and symptoms diminished. However, 2 months later the child developed strabismus and signs of chorioretinitis. Serological tests revealed significantly elevated titers of anti-*T. gondii* specific IgG antibodies (2840 IU/ml). The child was diagnosed with CT and received a therapy with a pyrimethamine and sulphadiazine together with methylprednisolone. Despite treatment, the child developed drug-resistant epilepsy, required polytherapy of valproic acid and pyridone to control the attacks. He has signs of a pyramidal syndrome, quadriplegia and a decreased pupil light response.

Further investigation revealed that the mother was tested for toxoplasmosis once in the first trimester. The test was negative and was not repeated again. However, serological evaluation of the mother indicated that she was infected in the last months, most probably during pregnancy.

**Conclusion.** An unrecognized CT poses a high risk of severe neurological sequelae. Delayed diagnosis significantly hampers treatment results.

**Summary.** This case establishes the importance of proper serological screening for toxoplasmosis during pregnancy. Early recognition of primary infection during pregnancy and prompt treatment may decrease the risk of complications caused by congenital toxoplasmosis.

## RARE MYELOID NEOPLASM PRESENT AS TUMOR OF TESTIS: CASE REPORT

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**Keywords.** Myeloid, neoplasm, testis.

**Introduction.** Blastic plasmacytoid dendritic cell neoplasm (BPDCN) is a rare aggressive disease of the bone marrow and blood that affects multiple organs, including the lymph nodes and the skin. Typically occurs in older adults, mainly in male. To date more than 200 cases of this tumor were reported. Because of the diagnostic difficulties the tumor tends to be misdiagnosed and underreported. Testicular manifestation was reported to be present in less than 5 % of cases. Due to lack of data no optimal treatment has been established. Report of a case of BPDCN with unusual presentation dominated by disseminated skin rash and large testicular mass extending to paratesticular tissues.

**Case report description.** 74-year old male was admitted to hospital in order to surgical excision of tumor of right testis. Patient reported acute testicular pain that started ten days before admission. Examination revealed abnormal mass (8x6x4,5cm) in right testis and an erythematous rash on the entire skin surface. LDH level was elevated up to 568 U/L, AFP and beta-HCG levels were within normal range. Surgical excision of the right testis and biopsy of the skin lesions were performed.

**Conclusion.** There were no complications during the procedure and postoperative period. Histopathological examination revealed CD56+/CD4+/MPO- blastic cells infiltrating testis and skin. The patient was immediately send to hematological out-patient clinic where he was treated with modified CHOP regimen. Patient survived ten months since the tumor excision.

**Summary.** BPDCN of testis with reference to its rarity should intensify medical watchfulness. The neoplasm poses diagnostic difficulties and especially in advanced stage may present as organ-infiltrating mass. The median survival is approximately 12-14 months. Therefore, with intensive therapy for acute leukemia the rate of sustained complete remission increases. Only myeloablative treatment with allogenic bone marrow during the first remission resulted in chance of long-term survival.

## PEDIATRIC PATIENT WITH RECURRENCE OF CUSHING'S DISEASE. A CASE REPORT

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**Keywords.** Cushing's disease, children.

**Introduction.** Pediatric Cushing's syndrome is rare in childhood and adolescence. The condition is caused by prolonged exposure to excessive glucocorticoids which can be secreted endogenously or administered exogenously. The most common cause of endogenous Cushing's syndrome is Cushing's disease, defined as hypercorticism caused by an ACTH-secreting pituitary adenoma. Most pediatric patients with this condition have typical cushingoid appearance, but young children are more likely to present with poor growth and obesity. The retrospective study was done by using medical records of pediatric patient with Cushing's disease in Children's Clinical University hospital of Riga

**Case report description.** 7 years old female patient was referred to Children's Clinical University hospital for further investigation due to slow growth velocity and overweight (12.07.2015.). Objective examination: weight 31,3kg (+1,3SD), height 116cm (-1,5SD), BMI 23,3kg/m<sup>2</sup> (>95.pc), increased subcutaneous fat throughout the body, especially in the torso and face area, stretch marks on the thighs. Laboratory studies revealed elevated cortisol level and MRI - microadenoma in adenohypophysis in right side, thus confirming the diagnosis of Cushing's disease. After 2 months endoscopic transsphenoidal pituitary adenoma resection was performed in Gunzburg (Germany). After surgery, patient was regularly seen by endocrinologist. She received substitution with hydrocortisone 20 mg/m<sup>2</sup>. The dose was gradually decreased until discontinued. The patient growth velocity improved, weight gain was appropriate. Hormonal screenings were stable. In 19.02.2018. patient was hospitalized because of suspicious of recurrence of Cushing's disease. The results of the hormonal tests suggested hypophyseal hypercorticism. Imaging diagnostic tests did not point to ACTH secretion tumor's precise localization. For further investigation and therapy, patient was sent to Gunzburg. In September, 2018, she had surgery and 2 small adenomas were resected.

**Conclusion.** The case demonstrates how challenging are diagnostic and treatment of Cushing's disease, which requires multidisciplinary approach and close collaboration with colleagues.

## FACES OF HYPOGLYCAEMIA: A CASE OF NON-INSULINOMA PANCREATOGENOUS HYPOGLYCAEMIA SYNDROME

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**Keywords.** Hypoglycaemia, non-insulinoma pancreatogenous hypoglycaemia syndrome, nesidioblastosis.

**Introduction.** Non-insulinoma pancreatogenous hypoglycaemia syndrome is a rare condition characterized by endogenous hyperinsulinemic hypoglycaemia that is not caused by an insulinoma. Patients present with neuroglycopenic episodes and nesidioblastosis- a term used to identify focal or diffuse hypertrophy and hyperfunction of pancreatic beta cells islets.

**Case report description.** A 68-year-old woman with a history of neuroendocrine gastric tumor and total gastrectomy presented with complaints of frequent postprandial hypoglycaemia. In the meantime, patient is regularly followed up by oncologist and is aware of low glycaemic index diet, yet hypoglycaemic episodes tend to occur more often and severe. SPECT CT findings showed no dissemination of neuroendocrine tumor. The imaging technique compatible with an insulinoma as somatostatin receptor scintigraphy indicated no pathological findings. Subsequent laboratory results 1 hour after 75 glucose OGTT displayed hyperinsulinaemia (C-peptide 9,65 ng/ml, glycaemia 11,4 mmol/L), 2 hours later C-peptide stayed elevated (C-peptide 4,88 ng/ml, glycaemia 5,0 mmol/L), 3 hours later patient presented with the symptoms of hypoglycaemia (glycaemia 3,8 ng/ml). These results indicated the confirmation of nesidioblastosis and non-insulinoma pancreatogenous hypoglycaemia syndrome. In order to avoid life-threatening hypoglycaemia, it was decided to prescribe T.Proglycem 100 mg.

**Conclusions.** Non-insulinoma pancreatogenous syndrome is an extremely rare condition in adult population and is the cause of endogenous hyperinsulinemia in < 5% of the cases. Clinically, it is difficult to distinguish NIPHS from insulinoma. While confirmative diagnosis remains challenging and the cause of adult-onset nesidioblastosis is unknown, there is a potential association with the gastric bypass surgery.

**Summary.** The case demonstrates uncontrolled symptomatic hypoglycaemia in a patient with a previous gastrectomy. The initial differential diagnosis included insulinoma. Extensive imaging examinations as CT, SPECT scans, somatostatin receptor scintigraphy showed no evidence of neuroendocrine lesions and pancreatic masses. The primary cause of hypoglycaemia was non-insulinoma pancreatogenous syndrome due to secondary nesidioblastosis post-gastrectomy.

## THE ANALGESIC EFFECT OF TRANSCRANIAL MAGNETIC STIMULATION IN INDIVIDUALS WITH PHARMACORESISTANT NEUROPATHIC PAIN

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**Keywords.** Repetitive transcranial magnetic stimulation, neuropathic pain, Numeric Pain Rating Scale, Neuropathic Pain Symptom Inventory, Patient Global Impression Of Change.

**Objectives.** Neuropathic pain (NP) affects 7–10 % of the general population. NP is especially problematic because of its severity, chronicity and resistance to analgesics. Various studies showed that repetitive transcranial magnetic stimulation (rTMS) applied over the motor cortex could relieve NP. Our objectives are to evaluate the analgesic effect of rTMS in individuals with pharmaco-resistant NP.

**Materials and methods.** An ongoing prospective study carried out at Clinic "DiaMed" in Riga, Latvia. Three individuals with trigeminal neuralgia and one with facial pain syndrome before and after each stimulation, were evaluated using Numeric Pain Rating Scale (NPRS), Neuropathic Pain Symptom Inventory (NPSI) was used at the beginning and end of the stimulation course, and Patient Global Impression Of Change (PGIC) – at the end. The minimum number of stimulations: 10 stimulations (one per day, excluding weekends).

### **Results.**

1<sup>st</sup> case. 10 stimulations. NPRS score reduction rate is ~ 71 %. NPSI score reduction rate is ~ 90 %. PGIC score: 2.

2<sup>nd</sup> case. 15 stimulations. NPRS score reduction rate is 80 %. NPSI score reduction rate is ~ 77 %. PGIC score: 2.

3<sup>rd</sup> case. 20 stimulations. NPRS score reduction rate is 40 %. NPSI score reduction rate is ~ 23 %. PGIC score: 3.

4<sup>th</sup> case. 10 stimulations. NPRS score reduction rate is 0 %. NPSI score increased by 11 points. PGIC score: 4.

Diagnosis: maxillary nerve compression by hemangioma.

All individuals reduced their doses of medication.

**Conclusions.** 3 out of 4 patients showed improvement in their health status. It is possible to reduce the level of pain as well as reduce the dose of medication using rTMS.

**Summary.** rTMS is a relatively new and perspective method of pain treatment.

## MENSTRUAL PSYCHOSIS IN AN ADOLESCENT GIRL

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**Keywords.** Menstruation, psychotic disorder.

**Introduction.** The aim was to explore the scientific evidence base for the existence of menstruation linked psychotic disorder and describe a clinical case of this rare condition; to increase familiarity with the condition among physicians and encourage the collection of a reproductive history when dealing with acutely psychotic female patients in clinical practice.

**Case report description.** A 13 years old girl was referred to the Child Psychiatry clinic on the 9th of April 2016 due to rapid development of acute psychotic symptoms. Upon admission the patient appeared confused, with disorganized thinking and psychomotor retardation, having delusions, auditory and visual pseudo-hallucinations. Initial treatment involved risperidone 1mg twice daily and low doses of tranquilizers. Laboratory tests, an EEG and a CT were carried out and were normal, also no neurological pathologies were found. During the hospitalization her symptoms resolved completely, and she was discharged on the 26th of April. The patient continued the treatment and experienced no relapses until the risperidone dose was gradually reduced by September to 0.5mg daily and she suffered similar, but milder psychotic episode. In October similar episode happened and it became apparent that these episodes had started on the 1st day of her menstrual period and resolved spontaneously within a few days of cessation of menstruation. The patient was followed-up and a relation between changes in her mental status and menstrual cycle was observed. She discontinued the treatment with risperidone in April of 2017 when her menstrual cycle had stabilized and there were no more relapses of psychotic symptoms.

**Conclusion.** Psychotic episodes synchronizing with menstrual cycle have been described for many years in case reports. They are relatively short and resolves completely.

**Summary.** The recognition of them is of high relevance because of differential prognosis and treatment compared to schizophrenic episodes or other mental health conditions.

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