



RĪGA STRADIŅŠ UNIVERSITY INTERNATIONAL STUDENTS CONFERENCE 2021

# Abstract Book

HEALTH SCIENCES





Rīga Stradiņš University  
INTERNATIONAL STUDENT  
CONFERENCE 2021

March 22<sup>nd</sup>-23<sup>rd</sup>, 2021

# Abstract Book

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HEALTH SCIENCES



Rīga, Latvia

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# Preface

## Dear students, dear professors, dear guests!

On behalf of Rīga Stradiņš University, it is my great honour and pleasure to welcome you all to Rīga Stradiņš University Research Week 2021 and especially to the International Student Conference "Health and Social Sciences".

We are meeting at a very stressful time for the whole world – during the COVID-19 pandemic. I am, however, satisfied that our technological capabilities ensure that we can still proceed to carry out research. RSU Research Week is one of the largest scientific events in the Baltics and it is organised every two years.

Today, we welcome 420 students from 30 countries to the conference, who will be presenting their theses in both medical and social sciences across the conference's 24 sections. In addition, 120 international jury members will participate in the conference that will also feature three special keynote speakers. This testifies to the outstanding research capabilities of RSU students.

This conference is a significant event for each participant as it brings together students and experts from different fields. Rīga Stradiņš University aims to be a modern, prestigious university that is recognised in Europe and worldwide and that has the individual at its core – our students, professors, researchers and all academic and administrative staff are all essential to our team.

Dear students! I hope that you all will experience a conference where you will acquire many creative ideas and forge new professional contacts.

I wish you a productive and successful conference! Stay healthy!

Professor **Aigars Pētersons**  
RECTOR OF RĪGA STRADIŅŠ UNIVERSITY

## Dear friends and guests of Rīga Stradiņš University,

As organizers we are glad to have you with us during this difficult time that COVID-19 has brought. International Student Conference of Rīga Stradiņš University is opening its virtual doors for the second time in online format!

Despite all challenges we have faced, it is a pleasure that we received a huge amount of applications that is even bigger than before pandemic. Our team has come a long way to provide you the best of what online conferences can provide! I hope you will enjoy our keynote speakers, plenary sessions and workshops that will explore new horizons for all of you! Let's start this two-day long journey with enthusiasm, curiosity and hope that soon we will be able to meet in person!

Take care and stay safe!

**Māris Lapšovs**  
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# ANAESTHESIOLOGY, REANIMATOLOGY, EMERGENCY MEDICINE

## AIRWAY ANATOMICAL ACCURACY OF MANNEQUINS USED IN MEDICAL STUDENT TEACHING IN LATVIA

Author: *Matīss Briuks*<sup>1</sup>

Scientific research supervisor: Dr. med. *Sigita Kazūne*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Hospital of Traumatology and Orthopedics, Latvia*

**Keywords.** Airway management, mannequins, anatomical accuracy.

**Objectives.** Mannequins are widely used in medical education to teach airway management skills. However, there is debate whether commercial airway mannequins represent human anatomy accurately, as this is important in preparation for real medical emergencies. The aim of this study was to compare, using radiological measurements, the airway anatomy of real patients and airway mannequins used in medical student teaching in Latvia.

**Materials and Methods.** Computer tomography (CT) scans of 50 adult patients with trauma taken from a pre-existing database were used to obtain eight distances in the upper airway. The departments of Anaesthesiology in Rīga Stradiņš University and University of Latvia were contacted to clarify the types of mannequins used in student teaching. The corresponding airway distances for mannequins were obtained from previous publications. The percentile distribution of each airway distance in trauma patients was obtained, and mannequin measurements were scored as percentiles in this distribution.

**Results.** Mannequins accessible in Rīga Stradiņš University and University of Latvia were Laerdal Airway Management trainer (LAMT), Human patient simulator (HPS), Laerdal SimMan 3G and Laerdal SimMan. Six out of eight measurements were outside 25th to 75th percentile in LAMT, Laerdal SimMan 3G and Laerdal SimMan. In HPS three out of seven measurements were either in 1st or 4th quartile. Especially, the distance between the epiglottis and posterior pharyngeal wall was much wider (>99th percentile) in mannequins than in patients.

**Conclusion.** LAMT, HPS, Laerdal SimMan and SimMan 3G do not accurately represent airway anatomy for majority of real-life trauma patients in Latvia. This can affect airway training.

## IDENTIFICATION OF RISK FACTORS FOR SECONDARY VASOSPASM AND DELAYED CEREBRAL ISCHEMIA IN PATIENTS WITH ANEURYSMAL SUBARACHNOID HEMORRHAGE

Authors: *Ilja Bobrovs*<sup>1</sup>, *Veronika Ribcova*<sup>1</sup>

Scientific research supervisors: Dr. *Ieva Būce-Šatoba*<sup>1</sup>, Asoc. Prof. *Agnese Ozoliņa*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Aneurysmal subarachnoid hemorrhage, cerebral vasospasm, delayed cerebral ischemia, risk factors.

**Objectives.** Retrospectively identify the risk factors of cerebral vasospasm (CV) and delayed cerebral ischemia (DCI) in patients with SAH.

**Materials and Methods.** Medical records of 201 patients admitted in Intensive Care Unit of Rīga East University Hospital with aneurysmal SAH between January 1, 2016 and December 31, 2018 were reviewed. According admission criteria 117 were enrolled for further analysis. Average patient age was  $56 \pm 15.1$  years, 48 males and 69 females. We evaluated patient-related risk factors (gender, age, body mass index, primary arterial hypertension, diabetes mellitus, smoking, chronic alcoholism, atherosclerosis, family anamnesis), as well as Glasgow coma scale (GCS), Fisher score at admission, localization of SAH and treatment. Statistical significance  $p < 0.05$ .

**Results.** For 25 (21.4%) patients CV was detected using digital subtraction angiography and computer angiography in average on  $7.2 \pm 4$  day. Totally, DCI developed in 26 (22.4%) cases. Risk for DCI is higher in males as compared to females (31% vs. 15%;  $p = 0.043$ ); CV occurs equally in both genders ( $p = 0.208$ ). Lower GCS at admission is associated with higher risk of CV ( $14 \pm 3$  vs.  $13 \pm 3$ ;  $p = 0.025$ ). Patient-related risk factors, differences in Fisher score and treatment showed no difference. Most often DCI was diagnosed in patients with anterior communicating artery ( $p = 0.009$ ) and left medial cerebral artery ( $p = 0.009$ ) rupture. Hydrocephalus also was associated with higher risk of CV and DCI development ( $p = 0.048$  and  $p = 0.048$ ).

**Conclusion.** Main risk factors are lower GCS at admission for CV, and male gender for DCI. Greater possibilities for developing CV and DCI have patients with anterior communicating artery and left medial cerebral artery rupture as well as those with hydrocephalus.

## LEVEL OF BURNOUT IN HEALTH CARE PROFESSIONALS WORKING IN INTENSIVE CARE UNITS IN LATVIA

Author: *Jessica Ferreira*<sup>1</sup>

Scientific research supervisor: Dr. *Ivars Veģeris*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Burnout; intensive care unit; Oldenburg Burnout Inventory; health care professionals.

**Objectives.** To determine the level of burnout among the healthcare professionals working in Intensive Care Units in Latvia and its association with the sociodemographic profile.

**Materials and Methods.** In this descriptive and quantitative study all physicians and nurses currently working in an Intensive Care Unit at the three largest hospitals in Rīga (Pauls Stradiņš Clinical University Hospital; Rīga East Clinical University Hospital and Children's Clinical University Hospital) were invited to participate. Data were collected between the 1st of June and the 1st of September of 2020, through a sociodemographic questionnaire and a 16-item survey - *The Oldenburg Burnout Inventory* - with positively and negatively framed items and responses being in the form of a 4-point Likert scale.

**Results.** A 62% ( $n=190$ ) response rate was obtained. Overall, the mean score for burnout was 2.43 ( $SD=0.34$ ), with the mean score for Disengagement being 2.31 ( $SD=0.38$ ) and 2.56 ( $SD=0.40$ ) for Exhaustion. Participants working in the Children's Clinical University Hospital showed the lowest mean score of burnout (Total: 2.28; Disengagement: 2.13 and Exhaustion: 2.43) and participants in the "Latvian Oncology Centre" of the Rīga East Clinical University Hospital the highest (Total: 2.61; D: 2.52 and E: 2.71). The level of burnout was associated with the type ( $p=0.011$ ) and the place of work ( $p=0.017$ ), while exhaustion correlated to type of work ( $p=0.006$ ).

**Conclusion.** These findings agree with results of similar studies on health care professionals in other countries and confirm that healthcare professionals in Latvia also experience significant levels of burnout in their job. This study can help to identify where to develop initiatives and procedures aiming at reducing the incidence of burnout, with the goal of increasing the quality of treatment received by the patients, and contributing to a better overall environment for all involved, professionals, patients and family members.

## VENTILATOR-ASSOCIATED PNEUMONIA: INCIDENCE, MORTALITY AND CAUSATIVE AGENTS

Author: *Mārtiņš Saulīte*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Oļegs Sabeļņikovs*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Ventilator-Associated Pneumonia, multi-resistant pathogens, incidence, mortality.

**Objectives.** Ventilator-Associated Pneumonia (VAP) is pneumonia that develops 48h or later after endotracheal intubation. VAP compose one third of all nosocomial pneumonias and its crude mortality rate is 30-70%. The aim of this study was to assess incidence and mortality rates of VAP, and to identify the most common causative pathogens, their antibacterial drug resistancy profile and its relevance to mortality.

**Materials and Methods.** This retrospective study included 150 patients that had been hospitalized in Pauls Stradiņš Clinical University Hospital Intensive Care Unit from January 1<sup>st</sup> to April 14<sup>th</sup>, 2019. Overall, 94 patients were excluded and 56 patients that met authors criteria were divided into VAP group (n=34) and non-VAP group (n=22). Descriptive and analytical statistics were performed by SPSS statistics, level of significance was set at  $p < 0.05$ .

**Results.** 48.6% (n=34) of all endotracheally intubated patients developed VAP. Incidence Density was 37 VAP episodes for every 1000 mechanical ventilation days. Crude-mortality rate for VAP patients was 50% and for non-VAP patients 13.6%; groups were compared using Chi-square test and difference between mortality rates was statistically significant,  $\chi^2(1, N=56)=4.8$ ,  $p < 0.05$ . The most common causative agents for VAP were *Acinetobacter baumannii* 33.3% (n=15), *Klebsiella pneumoniae* 15.5% (n=7), *Pseudomonas aeruginosa* 8.9% (n=4) and *Staphylococcus aureus* 8.9% (n=4). Comparison between mortality rate of each pathogen was not successful, because of insufficient amount of data.

**Conclusion.** This research showed high VAP incidence and crude-mortality rate among ICU patients. Even though there wasn't sufficient data to make statistically proven statement, clear tendency that multi-resistant pathogens like *Acinetobacter baumannii* and *Klebsiella Pneumoniae* are associated with higher mortality rate was observed. Research gave significant insight on most common causative agents of VAP and changes in empirical treatment protocols should be suggested.



## THE ROLE OF NIRS IN CARDIAC SURGERY WITH CARDIOPULMONARY BYPASS

Authors: *Elvijs Ošs*<sup>1</sup>, *Anastasija Kraveca*<sup>1</sup>, *Dāvis Mackevičs*<sup>2</sup>

Scientific research supervisor: Dr. med. *Roberts Leibuss*<sup>1,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *University of Latvia, Latvia*

<sup>3</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** INVOS, cerebral oximetry, cardiac surgery.

**Objectives.** Non-invasive cerebral oximetry measured by INVOS is used to measure frontal lobe regional cortical oxygen saturation. Its usefulness during cardiac surgery is still being evaluated. This study was performed to investigate the correlation among INVOS intraoperative measurements, hematocrit (Ht), jugular venous oxygen saturation (SvjO<sub>2</sub>), mean arterial pressure (MAP) and intensive care unit (ICU) spent days.

**Materials and Methods.** This prospective, observational study was conducted at the Pauls Stradiņš Clinical University Hospital between September 2018 and December 2019. Data analysis was done with the SPSS v.26. Correlations between variables were assessed with Spearman rank correlation ( $p < 0.05$ ).

**Results.** 100 cardiac surgery patients with CPB (mean age  $65.0 \pm 10.9$ ) enrolled. There was correlation between Ht before CPB and INVOS left and right side before CPB ( $r = 0.2, p < 0.05$ ;  $r = 0.3, p < 0.05$ ), INVOS right side during and after CPB ( $r = 0.2, p < 0.05$ ). SvjO<sub>2</sub> before CPB was correlated with INVOS left and right side before CPB ( $r = 0.4, p < 0.05$ ), INVOS left and right side during CPB ( $r = 0.3, p < 0.05$ ;  $r = 0.2, p < 0.05$ ) and INVOS left side after CPB ( $r = 0.2, p < 0.05$ ). SvjO<sub>2</sub> during CPB correlated with INVOS left and right side during CPB ( $r = 0.3, p < 0.05$ ). Correlation was also found between SvjO<sub>2</sub> after CPB and INVOS left and right ( $r = 0.3, p < 0.05$ ). MAP during CPB correlated with INVOS right during CPB ( $r = 0.2, p < 0.05$ ). INVOS left and right side measurements before CPB correlated with ICU spent days ( $r = -0.3, p < 0.05$ ;  $r = -0.3, p < 0.05$ ).

**Conclusion.** There are significant correlations between intraoperative INVOS measurements and Ht, SvjO<sub>2</sub>, MAP, which could be used as prognostic factors for cerebral oxygenation in case the INVOS system is not available. There is a negative correlation between INVOS left and right side before CPB and days spent in ICU after surgery. This study provides some direction for future research on factors that could prognose cerebral oxygen saturation during cardiac surgery and neurological complications, therefore prognosing post-operative ICU days.

## PERINEURAL NERVE STIMULATION FOR ACUTE PAIN MANAGEMENT AFTER SHOULDER JOINT REPLACEMENT (PILOT STUDY)

Authors: *Natālija Buraka*<sup>1</sup>, *Eva Vītola*<sup>1</sup>

Scientific research supervisors: Dr. *Inta Čerņavska*<sup>1</sup>,  
Dr. med. *Iveta Golubovska*<sup>1,2</sup>, Prof. *Aleksejs Miščuks*<sup>1,2</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Hospital of Traumatology and Orthopaedics, Latvia*

**Keywords.** Acute pain, nerve stimulation, perineural catheter, regional anesthesia, shoulder joint replacement.

**Objectives.** Adequate control of acute pain prevents the development of chronic pain. Perineural catheter used for analgesic injection, but nerve stimulation by it could become a new approach for pain control without additional medications. The aim of this study is to explore if the n.suprascapularis stimulation could relieve acute pain for patients after total shoulder joint replacement.

**Materials and Methods.** This prospective randomized pilot study includes 6 patients undergoing shoulder joint replacement under general anaesthesia and interscalene brachial plexus block. Perineural catheter was placed to the nervus suprascapularis for the 1<sup>st</sup> and the 2<sup>nd</sup> study group. Nerve stimulation was provided for the 1<sup>st</sup> group (0,4 mA, 100 Hz, 30 min), if patient feel pain. As a rescue medications both groups received Sol. Ropivacaini 0,375 % 5 ml by perineural catheter (if pain level by NRS > 4) and Morphine 10 mg s/c (if NRS > 6). The 3<sup>rd</sup> group received only Morphine 10 mg s/c (if NRS > 5).

**Results.** Pain level after surgery in the 1<sup>st</sup> group in rest and on movement accordingly was 0 and 0,5 (6 h), 0 and 2,5 (18h), 0 and 2,5 (30h). The amount of injected Sol. Ropivacaini 0,375 %: 25 ml and morphine: 10 mg. Pain level after surgery in the 2<sup>nd</sup> group in rest and on movement accordingly was: 0 and 0 (6h); 2 and 5,5 (18h), 2 and 5 (30h). The amount of injected Sol. Ropivacaini 0,375%: 20 ml, and morphine: 20 mg. Pain level after surgery in the 3<sup>rd</sup> group in rest and on movement accordingly was 4 and 4 (6h); 2 and 3,5 (18h), 2 and 4 (30h). The amount of injected morphine: 30 mg

**Conclusion.** Perineural stimulation might improve postoperative pain relief after total shoulder replacement surgery and could allow to reduce high doses of narcotic drugs. More patients should be enrolled to see the effectiveness.

## EFFECT OF DEXAMETHASONE ON ACUTE PAIN RELIEF, BLOOD GLUCOSE AND LACTATE LEVEL AFTER HIP ARTHROPLASTY

Author: *Natālija Buraka*<sup>1</sup>

Scientific research supervisors: Dr. med. *Iveta Golubovska*<sup>1,2</sup>,  
Prof. *Aleksejs Miščuks*<sup>1,2</sup>, Dr. med. *Sergejs Zadorožnijs*<sup>1,2</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Hospital of Traumatology and Orthopaedics, Latvia*

**Keywords.** Inadvertent hypothermia, active warming, passive warming, pediatric anesthesia.

**Objectives.** The core temperature of the body is tightly controlled within strict parameters for the effective function of many enzyme and transport mechanisms. Intraoperative hypothermia (IH), defined as core temperature  $<36^{\circ}\text{C}$ , has been associated with numerous complications, disturbed drug metabolism, postoperative infection, hemorrhage. Many factors are contributing to intraoperative hypothermia. The study aimed was to investigate potential risk factors for IH.

**Materials and Methods.** This is a prospective study conducted through observation and measurement of pediatric patient temperature. 200 patients undergoing general anesthesia, elective surgery were divided into randomized groups: a control group and an experimental group. The core temperature was assumed to be that of esophagus temperature and surface temperature. The parameters that were considered as risk factors for hypothermia include patient baseline temperature, operation type, length of surgery, duration of anesthesia, patient's age, forced air warmer using. Correlation between these parameters and inadvertent hypothermia was sought. Data were analyzed in the SPSS. P-value less than 0,05 considered reliable.

**Results.** Patients who received only cotton blanket warming ( $n=100$ ) were 0.47 times as likely to develop hypothermia during the operation as patients who received a cotton blanket and forced-air warmer ( $n=100$ ) (95% CI 0.31–0.71). Active warming (OR = 0.47, 95% CI 0.31–0.71), baseline core temperature ( $36.0\text{--}37.0^{\circ}\text{C}$ ) before anesthesia (OR = 0.07, 95% CI 0.04–0.14) were significant protective factors for IH. The correlation between duration of anesthesia ( $\geq 50\text{min}$ ) and length of surgery ( $\geq 45\text{min}$ ) was statistically significant ( $p<0.05$ ) – associated with increased the risk of hypothermia. Patients age 3–5 ( $p<0.01$ ) and 9–11 ( $p<0.05$ ) were potential risk factors of hypothermia developing. Type of operation had not statistically significant between groups ( $p>0.05$ ).

**Conclusion.** Duration of anesthesia ( $\geq 50\text{min}$ ), length of surgery ( $\geq 45\text{min}$ ), patients 3–5 and 9–11 year old are associated with a higher risk of IH in pediatric surgery. Higher baseline core temperature before anesthesia and forced air warmer using reducing the risk of IH.

## PREDISPOSING FACTORS FOR INADVERTENT HYPOTHERMIA IN PEDIATRIC SURGERY

Author: *Dana Vasiļenko*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Arta Bārzdīņa*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Inadvertent hypothermia, active warming, passive warming, pediatric anesthesia.

**Objectives.** The core temperature of the body is tightly controlled within strict parameters for the effective function of many enzyme and transport mechanisms. Intraoperative hypothermia (IH), defined as core temperature  $<36^{\circ}\text{C}$ , has been associated with numerous complications, disturbed drug metabolism, postoperative infection, hemorrhage. Many factors are contributing to intraoperative hypothermia. The study aimed was to investigate potential risk factors for IH.

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**Conclusion.** Duration of anesthesia ( $\geq 50\text{min}$ ), length of surgery ( $\geq 45\text{min}$ ), patients 3-5 and 9-11 year old are associated with a higher risk of IH in pediatric surgery. Higher baseline core temperature before anesthesia and forced air warmer using reducing the risk of IH.

## DIFFERENCE OF THERAPY DEPENDING ON OUTCOME IN PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA INDUCED SEPTIC SHOCK

Author: *Edvīns Bergmanis*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Oļegs Sabeļņikovs*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Sepsis, pneumonia, intensive care, vasopressors, fluid.

**Objectives.** The aim of this study was to estimate effect of infusion and vasopressor therapy depending on outcome in Intensive Care Unit (ICU) patients with community acquired pneumonia (CAP) induced septic shock.

**Materials and Methods.** Retrospective study was developed, which summarizes and analyses data of 25 patients with a CAP induced septic shock admitted to the ICU of Pauls Stradiņš Clinical University hospital in 2019. The data obtained were compared between survivors and non-survivors. For statistical analysis IBM SPSS Statistics 26.0 was used.

**Results.** Surviving group included 10, non-surviving group included 11 patients. Data of 4 patients who passed away in the first 24 hours from admission were excluded from analysis. Administered fluid volumes were similar in the both groups. However, in the first three hour surviving patient group average received fluid volume were 200ml more than in the non-surviving group. Surviving patients received lower vasopressor median doses and vasopressor support was declined within study period. Initial lactate levels were lower in the surviving group and in dynamic decreased more than in the non-surviving group. There were more commonly comorbidities in the non-surviving patient group.

**Conclusion.** Required vasopressor doses and magnitude of the dose dynamic are associated with ICU mortality. There was a tendency for lactate level to decrease more in the survival group than in the non-survival group, while lower doses of vasopressors were used. Administered fluid volume does not contribute significantly to ICU mortality. Comorbidities, age, initial lactate level and lactate dynamic is important predictors for the outcome in the ICU patients with CAP induced septic shock.

## DOES EXPERIENCE OF THE INTUBATOR AFFECT AEROSOL AND DROPLET GENERATION DURING INTUBATION: A SIMULATION STUDY

Author: *Edvards Kalniņš*<sup>1</sup>

Scientific research supervisor: Dr. *Sigita Kazūne*<sup>2</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19; simulation study; droplet spread; experience of intubator; contact contamination.

**Objectives.** The objective of this study was to examine the extent of contact contamination, droplet spread and aerosolization that occur during intubation in a mannequin study and to compare the results between an experienced intubator and a young doctor using 4-point Likert scale.

**Materials and Methods.** In the experiment an atomiser device containing luminescent fluid was placed into Laerdal Airway mannequin's pharynx. An experienced intubator and a young doctor intubated the mannequin 5 times each using a videolaryngoscope while 0.5 mls of luminescent fluid was sprayed through atomiser. The droplet spread and contact contamination after intubation were visualised using ultraviolet light and standardized photographs taken. The extent of spread was evaluated using a 4-point Likert scale (0 to 3) by two independent observers. To assure the reliability of the results, the Cohen  $\kappa$  coefficient of interrater reliability between the 2 examiners was calculated.

**Results.** For experienced intubator contact contamination and droplet spread was 1(0-1) and 2(1-2). For young doctor the results were 2,5(2-3) and 1(0-1) for contact contamination and droplet spread, accordingly. The Cohen  $\kappa$  coefficient was 0.6, which demonstrated substantial agreement between examiners.

**Conclusion.** Less contact contamination was observed with experienced practitioner. Intubation done by young doctor resulted in less droplet spread.

## FIRST AID KNOWLEDGE AND SKILLS FOR RSU STUDENTS 1-5 YEARS AFTER OBTAINING A DRIVER'S LICENSE

Authors: *Laura Gelderiņa*<sup>1</sup>, *Evelīna Stepiņa*<sup>1</sup>, *Jūlija Vorobjova*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Oļegs Sabeļņikovs*<sup>1,2</sup>,  
Mg. Iur. *Andreta Slavinska*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** First aid skills. Simulations. Life-threatening condition. Vehicle driver's licence. Non-medical students.

**Objectives.** The data show that the number of potentially preventable pre-hospital deaths in 2017 has remained high and unchanged. Aim of the study is to determine the readiness and ability of non-medical students to provide first aid in a life-threatening situation within five years of obtaining a driver's licence.

**Materials and Methods.** This study consists of two parts. Analytical and descriptive, inductive, and deductive research methods were used in the theoretical part of the research. In the 1st stage of the research self-assessment survey was used. In the 2nd stage, which is a practical part of the study, it is planned to use simulation equipment, which will assess respondent's knowledge simulated environment. Data will be analyzed using Microsoft Excel 2018, SPSS Statistics.

**Results.** A total of 76 persons were included in the study, who met study criteria and had driver's licence for one to five years, of which 69 filled in the self-assessment survey. The results showed that 49.3% (n = 34) of the respondents rated their first aid knowledge as average. 58% (n = 40) of students rated their practical first aid skills as average, while 18.8% (n = 13) rated as poor. 76.8% (n = 53) of the respondents admit that they would feel safer if first aid skills were acquired using simulation equipment, moreover 44.9% (n = 31) admit that first aid knowledge and skills need to be updated periodically after 5 years, but 36.2% (n = 25) believe that this should be done every year.

**Conclusion.** Most students consider that it is necessary to use simulation equipment while obtaining first aid certificate to get driver's licence, which allows to practically improve the acquired knowledge. Students believe that first aid knowledge and skills need to be renewed periodically.

## OUTPATIENT BEHAVIOUR CHARACTERISTICS IN REGIONAL HOSPITAL ENDOSCOPY DEPARTMENT

Author: **Veronika Ribcova**<sup>1</sup>

Scientific research supervisor: Dr. **Egita Vītola-Rabāce**<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Vidzemes Hospital, Department of Anesthesiology and Reanimatology, Latvia*

**Keywords.** Sedation; endoscopic procedure; knowledge; reliable person; informed consent.

**Objectives.** Endoscopic procedure is performed under sedation. *Propofol* is administered for a sedation which can induce cardiorespiratory depression. Patients sign an informed consent that they accept the sedation and will not drive a car for the next 24 hours. The goal is to examine patient knowledge about sedation, restrictions and their behavior. Another purpose is to assess patient condition 2 hours after procedure to make sure it is safe for discharge.

**Materials and Methods.** Prospective research, interviewing and observing patients before and after endoscopic procedure, who have had sedation during my practical trainings in Vidzemes Hospital in the period from December 07, 2020 to December 18, 2020.

**Results.** Forty-two patients were interviewed and observed. 26 (62%) women and 16 (38%) men. 10 (24%) patients had esophagogastroduodenoscopy, 26 (62%) – fibrocolonoscopy, 6 (14%) – both. Age ranged from 19 to 84 years. The most common age group was from 50 to 59 years, total 12 (29%). 28 (67%) had driving license and 12 (43%) of them got to the hospital by car, others had a reliable person who provided support. From those who drove by themselves 4 (33%) had knowledge about restrictions. Only 2 (5%) knew the meaning of sedation because they were medical employees, others were informed by me. All patients signed an informed consent and agreed for anesthesia. After 2 hours when procedure was made all of them were conscious. Patients had no serious side effects except 3 (7%) cases when blood pressure difference between before and after sedation was  $\geq 50$  mmHg. After discharging 32 (76%) patients were taken by relatives, 7 (17%) were driving a car themselves and 3 (7%) used public transport.

**Conclusion.** Patients should be given information by medical workers about sedation and restrictions more profoundly.



# INCIDENCE OF INADVERTENT INTRAOPERATIVE HYPOTHERMIA UNDERGOING GENERAL ANESTHESIA IN RĪGA CHILDREN'S CLINICAL UNIVERSITY HOSPITAL

Author: *Dana Vasīlenko*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Arta Bārzdīna*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Intraoperative hypothermia, forced air warmer, pediatric surgery.

**Objectives.** Inadvertent intraoperative hypothermia (IIH) is an ascertained risk factor in pediatric surgery which affects postoperative outcomes. Hypothermia exposes the patient to delayed anesthesia recovery, postoperative shivering, coagulopathy, bleeding, wound infection, prolonged hospital stay. Our study aimed to determine the incidence of inadvertent intraoperative hypothermia.

**Materials and Methods.** 1–12 year old pediatric patients were enrolled in this prospective study. Patients were randomized in 2 groups- active and passive warming. After admission to the operation theater, the children received a cotton blanket with or without a forced-air warming blanket. Body temperature was measured continuously until the end of anesthesia. Statistical analyses were performed by using Microsoft office excel, SPSS software.

**Results.** Patients (n=200) were divided into two groups (active warming group 100; passive warming group 100). The mean age of the study population was  $7,5 \pm 3,1$  year. Mean operation time was  $41,9 \pm 12,2$  min and mean anesthesia time  $47,1 \pm 12,4$  min. 93,5 % of the patients (n=187) were normothermic in the preoperative phase. 30,5% of the patients (n=61) were hypothermic in intraoperative phase - 80% (n=49) in passive warming group and 20% (n=12) in active warming group.  $T_{\text{mean}}$  core temperature was higher in the active warming group than the passive warming group (36,4 vs 36,1,  $p < 0,001$ ). IIH incidence was higher among passive warming than active warming group (24,5% vs 6%,  $p < 0,001$ ).

**Conclusion.** As a result of the study, the incidence of IIH was significant high in the passive warming group during surgery. The use of an active warming device like the forced-air warming blanket system was found to be effective of reducing the incidence of intraoperative hypothermia and effectively maintaining body temperature in surgeries.

## ANESTHESIA METHOD INFLUENCE ON NEUROCOGNITIVE FUNCTION IN PATIENTS UNDERGOING TRANSCATHETER TRANSFEMORAL AORTIC VALVE IMPLANT SURGERY

Author: *Julija Keruze*<sup>1</sup>

Scientific research supervisor: Dr. med. *Roberts Leibuss*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** TAVI, neurocognitive impairment.

**Objectives.** In past decade TAVI(transcatheter aortic valve implantation) approach has increased in patients with severe aortic stenosis and high surgical risk. However TAVI has been associated with an increased risk of neurological events.

**Materials and Methods.** This study investigated n=50 patients (33 female and 17 male) with severe aortic stenosis undergoing TAVI procedure. Mean age was 81,96. We gathered information about their diseases, vital parameters and medication use and past stroke event. We divided patients in two groups, n= 29 receiving local anesthesia with conscious sedation, n= 21 undergoing general anesthesia. We used several neurocognitive validates scales for cognition assessment before and after TAVI. Those scales included- Montreal Cognitive Assessment (MoCA), Mini- Mental State Examination(MMSE). Both tests were conducted by specially trained medical personnel before operation, 24 hours and 48 hours after operation. Concomitantly 1 month after TAVI Quality of Life Scale (QOLS) were done.

**Results.** In MoCA total score  $\geq 26$  points was considered normal,  $\geq 26$  points was considered impaired. In MMSE test  $\geq 23$  points marked normal cognition,  $\geq 23$  points- mental deterioration. Cognitive impairment before operation using MoCA was detected in 19 patients receiving local sedation, for general anesthesia in 2 patients. 24 h after operation cognitive deterioration was seen in 24 patients receiving local anesthesia, after 48 h- in 26 patients, making 89,7%. After 24 h the same 2 patients receiving general anesthesia showed cognitive impairment, after 48- 3 patients, 14,3%. We used non- parametrical tests. For MoCA - Mann-Whitney Test, showing significantly statistical changes between before and 24 hours after operation,  $p < 0,000$  and between 24 and 48 hours,  $p < 0,000$ . For MoCA we also used Wilcoxon Signed Ranks Test  $p < 0,001$ .

**Conclusion.** Study shows that before TAVI n=2 patients, 42%, had a cognitive impairment; after 48 h of TAVI n= 29 patients, 58%, in MoCA received  $< 26$  point, showing cognitive impairment. 89,7% patients who received opioid anesthetic agent had cognitive decline. In opioid group neurocognitive decline  $< 26$  points had 19 of 29 patients.

# BASIC & PRECLINICAL SCIENCE (MORPHOLOGY, PATHOLOGY, GENETICS)

## MORPHOLOGICAL DIFFERENCES OF DILATED ASCENDING AORTA IN TUNICA MEDIA ELASTIC LAMELLAE IN PATIENTS WITH BICUSPID AND TRICUSPID AORTIC VALVES

Author: *Arnīs Birze*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Sandra Skuja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Dilated aorta, elastic lamellae, bicuspid aortic valve, tricuspid aortic valve.

**Objectives.** Aorta is the largest artery in the human body and its wall is composed of three layers. The thickest – tunica media (TM) contains a significant number of elastic lamellae which provide the elasticity according to changes of intraluminal blood pressure. The structure and the position of elastic lamellae can be alternated if certain congenital and acquired heart diseases are present. One congenital heart diseases that potentially could affect elastic lamellae morphological properties is bicuspid aortic valve (BAV) disease. This study aimed a comparative analysis of elastic lamellae in the dilated aortic wall in BAV and tricuspid aortic valve (TAV) patients.

**Materials and Methods.** Aortic wall tissue samples from 13 BAV and 12 TAV patients (mean age 64) were analyzed using a light microscope. Sections were stained with a routine and van Gieson stain – for visualization of connective tissue with elastin. Relative density, thickness, organization and fragmentation of elastic lamellae evaluations were included using a semi-quantitative method of counting with grades 1 to 3. Calculations were performed using SPSS v27.

**Results.** Both the relative density and disorganization of elastic lamellae of the aorta in BAV patients was statistically significantly higher ( $p < 0.001$  and  $p = 0.003$ ) compared to TAV patients. The thickness ( $p = 0.503$ ) and fragmentation ( $p = 0.085$ ) of lamellae was not different between BAV and TAV patients. Strong correlations were determined between the fragmentation and disorganization in both BAV ( $r = 0.646$ ,  $p < 0.001$ ) and TAV ( $r = 0.675$ ,  $p < 0.001$ ) groups.

**Conclusions.** Morphological properties of elastic lamellae in the TM layer of dilated aorta were different between BAV and TAV patients. Changes in the relative density in combination with a higher pattern of disorganization of elastic lamellae indicate alternations of elastic properties of the dilated aorta.

## INVESTIGATION OF AGE- AND SEX-ASSOCIATED CHANGES IN BRAIN STRUCTURES USING MRI VOLUMETRY POST-MORTEM

Author: *Darja Romančuka*<sup>1</sup>

Scientific research supervisor: Dr. *Allison Fulford*<sup>2</sup>

<sup>1</sup> *University of Bristol, United Kingdom*

<sup>2</sup> *University of Bristol, Senior Teaching Fellow in Anatomy, United Kingdom*

**Keywords.** Brain morphology, sex and age differences, structural MRI.

**Objectives.** Structural Magnetic Resonance Imaging is one of the most reliable methods of non-invasive investigation of soft tissues, which has already been exploited in previous studies. The aim is to develop a methodology and perform a systematic analysis of the cerebral structures, obtain a quantitative data set ready for statistical analysis and evaluate it against already existing research.

The objective of this cross-sectional study was to investigate sex- and age-associated changes of cerebral structures using MRI volumetry, with a potential determination of a particular sex and/or age group that is more susceptible to a specific neurodegenerative diseases, such as Alzheimer's disease, multiple sclerosis or vascular dementia.

**Materials and Methods.** In this research, post-mortem MRI brain scans of 8 donors (4 male, 4 female) were quantitatively analysed using ImageJ software. Previously identified regions of interest (ROI) (cerebral hemispheres, cerebral ventricles, cerebellum and total intracranial volume (TIV)) were outlined and measured in ROI manager tool installed in ImageJ software.

**Results.** The results showed larger TIV for male group of  $298.551 \text{ cm}^3 \pm 16.065$  – male group and  $282.683 \text{ cm}^3 \pm 5.12$  – female group. In male subjects both hemispheres were almost equal size, but in female subjects the interhemispheric difference was larger. Although, in male subjects the interhemispheric difference was minimal, the bilateral hemispheric analysis showed larger left hemisphere than the right in both sexes. The results showed no significant difference for all specified ROI when compared for sex- and age-associated changes.

**Conclusions.** It is recommended to consider a longitudinal, age- and sex-matched study to investigate the sexually dimorphic trajectories of cerebral development. Further studies may provide additional results for identification of the potential alteration in cerebral morphology due to natural ageing and sexual dimorphism of cerebral structures, that will aid in development of targeted therapeutic treatments for particular neurodegenerative diseases.

## ASSESSMENT OF MENSTRUAL BLOOD DERIVED STEM CELLS DECIDUALIZATION IN PATIENTS WITH UNEXPLAINED INFERTILITY

Author: *Giedrė Skliutė*<sup>1</sup>

Scientific research supervisor: Prof. Dr. *Rūta Navakauskienė*<sup>1</sup>

<sup>1</sup> *Vilnius University, Department of Molecular Cell Biology, Institute of Biochemistry, Life Sciences Center, Lithuania*

**Keywords.** Menstrual blood derived stem cells, reproduction system, unexplained infertility.

**Objectives.** For many couples, the inability to have children causes serious physical, social, psychological, and sexual disorders. 10% of infertile couples are diagnosed with unexplained infertility. Studies show that dysfunctional stem cells of reproductive system could be the ones to blame. One of the vital steps of successful pregnancy is decidualization – stem cells differentiation to epithelium like cells. In the present study, we aimed to estimate the possible decidualization markers in patients with unexplained infertility menstrual blood derived stem cells.

**Materials and Methods.** We examined menstrual blood stem cell samples from 2 healthy donors and 4 patients diagnosed with unexplained infertility. The expression of some genes related to decidualization, stemness, and angiogenesis, was examined by using RT-qPCR. Changes of selected 11 protein levels was determined by Western Blot analysis and fluorescent microscopy. Cell secretion profile was evaluated using mass spectrometer.

**Results.** We demonstrated that after decidualization induction with 8-brom-cAMP and medroxyprogesterone acetate in menstrual stem cells, stemness genes (NOTCH1, NANOG, WNT4, KLF4, OCT4, SOX2, LIN28A), decidualization genes (PRL, ESR, IGFBP, FOXO1) and angiogenesis regulation related genes (HIF1, VEGFR2, VEGFR3) are upregulated. Levels of proteins P53, P21, H3K27me3 and HyperAcH4 were found to increase during menstrual stem cell decidualization, and the levels of epigenetic regulation related proteins Ezh2, Suz12 and HDAC1, moreover, levels of vimentin and cadherin, decreased during decidualization. We observed that menstrual stem cells at decidua state secrete proteins involved in the regulation of the actin, estrogen and relaxin signaling pathways, the provision of cell-cell connections, and the management of inflammatory processes.

**Conclusions.** We suggest that changes in decidualization and stemness related gene expression and protein levels during menstrual stem cell induced decidualization could be an important message in unexplained infertility case studies.

## EVALUATION OF COLLAGEN TYPE IV EXPRESSION IN THE BASEMENT MEMBRANE OF SUBSTANTIA NIGRA IN CHRONIC AND YOUNG ALCOHOLICS

Author: *Marks Smirnovs*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Sandra Skuja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Collagen type 4, Basement membrane, Substantia Nigra, immunohistochemistry.

**Objectives.** Collagen type IV (collagen IV) plays an essential role in the vascular basement membrane (BM) composition by integrating proteins into this structure with a highly organized micro-architecture. An integrity and stability of BM are indispensable in the successful maintaining of blood-brain barrier (BBB). Studies of alcohol consumption have reported changes in the BM structure in both animal models and humans. The aim of this study was to analyze an expression of collagen IV in the BM of Substantia Nigra (SN) in the cases of alcohol abuse.

**Materials and Methods.** SN gray and white matter from 13 young adult alcoholics (YAA), 14 chronic alcoholics (CA) and 14 age-matched controls (AMC) were included in this study. Immunohistochemistry using anti-collagen IV antibody was performed, an immunoexpression was evaluated by light microscopy (400×). Semi-quantitative scoring was classified in five levels: from “no” to “very high” expression. Statistical analysis was performed using IBM SPSS v22.0.

**Results.** In the each study group, the BM revealed a significantly higher expression ( $p < 0.001$ ) of collagen IV in the gray compared to white matter. In both gray and white matter, BM revealed a significantly higher expression of collagen IV in the CA group compared to AMC ( $p = 0.003$  and  $p = 0.005$ , respectively). YAA gray matter demonstrated a significantly higher expression ( $p < 0.001$ ) of collagen IV compared to AMC. A similar observation was made in the white matter when the expression of collagen IV was compared between YAA and AMC groups ( $p = 0.015$ ).

**Conclusions.** Our results demonstrate a higher expression of collagen IV in the SN gray and white matter of both YA and CA compared to the AMC. An increased accumulation of collagen IV in the vascular BM can modulate the BBB structure.

## CHARACTERIZATION OF CERVICAL MORPHOLOGICAL CHANGES PATTERNS IN REPRODUCTIVE AND POSTMENOPAUSAL WOMEN

Authors: *Kajus Merkevičius*<sup>1</sup>, *Milda Adomaitytė*<sup>1</sup>

Scientific research supervisors: Dr. *Milda Kuprytė*<sup>2</sup>, Assoc. Prof. *Arvydas Čižauskas*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Faculty of Medicine, Medical Academy, Lithuania*

<sup>2</sup> *Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Menopause, reproductive age, cervical changes, cell atypia.

**Objectives.** In postmenopausal women the level of oestrogen decreases as progesterone increases, causing development of structural changes of genitalia. Thus, the aim of this research is to evaluate the morphology of cervical changes in reproductive and postmenopausal women.

**Materials and Methods.** Research was approved by the Lithuanian University of Health Sciences (LUHS) Bioethics centre. Patients who underwent hysterectomy in Obstetrics and Gynaecology clinic at LUHS Hospital Kaunas Clinics and pathology testing of excised specimens in 2018 were included. Prepared haematoxylin–eosin stained histological slides were examined by light microscopy for cervical structural changes. Statistical significance was considered as  $p < 0.05$ .

**Results.** Overall, 520 total hysterectomies were performed in 2018 at LUHS Hospital Kaunas Clinics, the average age of subjects –  $59.75 \pm 12.477$  years old, and 29.5% ( $n=154$ ) of them were of reproductive age. Cervicitis was detected in 59.6% ( $n=310$ ) of subjects. Rates of cervicitis, cervical metaplasia, hyperplasia and atrophy were similar in reproductive and postmenopausal age groups ( $p > 0.05$ ). Cervical metaplasia was identified in 6.5% ( $n=10$ ) of reproductive age subjects, 3.9% ( $n=6$ ) had hyperplasia, while atrophy was detected twice (1.3%). In postmenopausal group metaplasia, hyperplasia and atrophy, were identified in 3.6% ( $n=13$ ), 5.7% ( $n=21$ ) and 3.6% ( $n=13$ ) patients respectfully. Nabothian cysts were more likely to be identified in postmenopausal age (79.7%,  $n=188$ ;  $p < 0.001$ ). Structural neoplastic changes were detected in 11.5% ( $n=60$ ) of patients. Notably, atypical changes of cells in cervical epithelium were more common among patients of reproductive age ( $p=0.009$ ). It was 3.008 times more likely to find cell atypia in reproductive age subjects (95% CI 1.271-7.120).

**Conclusions.** Cervicitis, metaplasia and hyperplasia are detected in similar rates at reproductive and postmenopausal age, whereas cystic changes are more common in the postmenopausal age and cervical epithelial cytological atypia is 3.008 times more likely to be detected in reproductive age.

## EVALUATION OF COLLAGEN FIBRE MORPHOLOGICAL CHANGES IN THE TUNICA MEDIA OF DILATED WALLS OF THE ASCENDING AORTA

Author: *Pēteris Grīnbergs*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Sandra Skuja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Dilated aorta, collagen fibres, aging.

**Objectives.** The aorta is a flexible type of artery that provides systemic circulation. Structural changes in the wall of the ascending aorta may be due to a number of factors: congenital bicuspid aortic valve (BAV), altered tricuspid aortic valve (TAV), or age-related changes. Tunica media contains collagen fibres that affect aortic mechanical strength. The morphological alternations in collagen fibres can cause aortic stenosis, aneurysms, or dissection. The aim of study was to evaluate collagen bundle changes occurring in the aortic wall in TAV and BAV patients.

**Materials and Methods.** The study used surgical material from 12 TAV (mean age 67) and 13 BAV (mean age 60) patients, and 6 controls (mean age 80) obtained at autopsy. Histological samples were stained with SiriusRed and Masson's trichrome. A semi-quantitative analysis of the thickness, fragmentation, and organization of collagen bundles under a light microscope was done. The statistical analysis was performed using SPSS v27.

**Results.** More pronounced collagen fibre fragmentation ( $p = 0.001$ ), disorganization ( $p = 0.005$ ) and an increase in collagen bundle thickness ( $p = 0.007$ ) was observed in the controls compared to the BAV patients. The controls showed more pronounced fragmentation ( $p < 0.001$ ), disorganization ( $p = 0.003$ ) than the TAV patients. Comparing the TAV and BAV patients, a more pronounced fragmentation ( $p = 0.02$ ) was observed in BAV group. A significant negative correlation was found between collagen bundle thickness and fragmentation observed in the BAV patients ( $r = -0.246$ ,  $p < 0.005$ ).

**Conclusions.** In the tunica media, the BAV and TAV patients have less pronounced changes in fragmentation, organization, or an increase in the thickness of collagen fibre bundles compared to the control group. More pronounced alterations in collagen fibres in the controls suggests that age is a more significant factor compared to patients with altered TAV or BAV.



## BASIC ASPECTS OF BLADDER CANCER EPIDEMIOLOGY AND MORPHOLOGY

Authors: *Daniil Yefimchuk*<sup>1</sup>, *Vladyslav Kyslyi*<sup>1</sup>, *Olexander Piatybratov*<sup>1</sup>,  
*Yana Yushchenko*<sup>1</sup>

Scientific research supervisors: Assoc. Prof. *Vynnyk N.I.*<sup>1</sup>, Assist. *Babenko V.I.*<sup>1</sup>

<sup>1</sup>*Ukrainian Medical Stomatological Academy, Ukraine*

**Keywords.** Bladder cancer, oncurology, morphology, urology.

**Objectives.** Analyzing the specialized literature and data on morbidity and mortality from bladder cancer in Poltava region (Ukraine) to establish the characteristic aspects of epidemiology and clinical and morphological features of bladder cancer.

**Materials and Methods.** During the study, the incidence and mortality from bladder cancer in Poltava region for 2017-2020 were studied, based on the data of the cancer register of Poltava Regional Clinical Oncology Center and the bank of archival biopsy material of Poltava Regional Pathological Bureau.

**Results.** For the period from 2017 to 2020, an average of 154 patients were diagnosed annually in the Poltava region. The indicators for the study period did not fluctuate significantly, but tended to increase somewhat, averaging 5% per year. Bladder cancer was diagnosed 4.5 times more often among men than women. The mortality rate in the Poltava region averaged 5.23 per 100,000 population. Mortality among men from the pathology we studied was 5 times higher than among women. During the histological examination of the samples, mostly invasive forms were observed (about 70%). Determining the degree of differentiation, it was found that the percentage of tumors with the third degree of anaplasia (G 3) was 18%, with the first degree of anaplasia (G 1) - 28%, the most common were moderately differentiated variants - (G2) - 54%,

**Conclusions.** Bladder cancer is the most common malignant neoplasm of the urinary tract, and, statistically, the most common disease, diagnosed in elderly men. The incidence and mortality from bladder cancer in Poltava region is slightly different from the national indicators, there is a tendency to increase. When determining the degree of differentiation, in both invasive and non-invasive forms, moderately differentiated variants significantly prevailed.

## EVALUATION OF TGF- $\beta$ 1 AND EGFR IN CLEFT AFFECTED LIP MUCOSA

Author: *Olga Rimdenoka*<sup>1</sup>

Scientific research supervisor: Prof. *Māra Pilmane*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Orofacial cleft, TGF- $\beta$ 1, EGFR.

**Objectives.** The morphopathogenesis of orofacial cleft development is only partly understood; therefore it is important to identify factors, which possibly could be involved in it. The aim of the study was to evaluate the distribution of TGF- $\beta$ 1 and EGFR-containing cells in cleft affected lip mucosa.

**Materials and Methods.** The study group included lip mucosa tissue samples from 14 patients with orofacial cleft. The control group contained 11 healthy oral mucosa tissue samples. The tissue sections were stained by immunohistochemistry for TGF- $\beta$ 1 and EGFR. The expression of positive structures was graded semiquantitatively. IBM SPSS 26.0 was used for statistical analysis, Spearman's rank correlation and Mann-Whitney U tests were performed.

**Results.** Mostly few to moderate number (+/++) of TGF- $\beta$ 1-containing cells were found in epithelium, also the same number of fibroblasts and macrophages was seen in the lamina propria of cleft affected lip mucosa. Meanwhile, healthy oral mucosa on average demonstrated a moderate number (++) of TGF- $\beta$ 1-containing epithelial cells, fibroblasts and macrophages. A variable, mostly indistinct number of EGFR-containing cells was seen in the epithelium of cleft affected lip mucosa, meanwhile, mostly no (o) EGFR positive cells were found in the epithelium of healthy mucosa. Statistically significantly less TGF- $\beta$ 1-containing cells were found in the epithelium of cleft affected lip mucosa than in the healthy mucosa (U=33.000; p=0.015). Also the lamina propria of cleft affected lip mucosa showed statistically significantly less TGF- $\beta$ 1 immunoreactive fibroblasts and macrophages than the healthy mucosa (U=28.500; p=0.006).

**Conclusions.** The lesser number of TGF- $\beta$ 1-containing epithelial cells, fibroblasts and macrophages in cleft affected lip mucosa than in healthy oral mucosa proves the role of problematic tissue remodeling in the cleft pathogenesis. The distribution of EGFR in cleft affected and healthy mucosa is similar and possibly does not play a role in the cleft development.

## ASSESSMENT OF EXPRESSION OF MYELOPEROXIDASE AND HISTONE H3 IN AORTIC VALVES AND VALVE VEGETATIONS IN PATIENTS WITH INFECTIVE ENDOCARDITIS

Author: *Nīks Ričards Goldiņš*<sup>1</sup>

Scientific research supervisors: Prof. *Valērija Groma*<sup>2</sup>, Dr. *Kristiāns Meidrops*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia*

<sup>3</sup> *Pauls Stradiņš Clinical University Hospital, Center of Cardiac surgery, Latvia*

**Keywords.** Infective endocarditis; aortic valves; vegetations; myeloperoxidase; histones.

**Objectives.** Infective endocarditis (IE) as an inflammatory disease often manifests with vegetations' embolism and sepsis. Netosis as a process of the immune system response can be a cause for vegetation formation in the case of IE. This study aimed to evidence netosis in aortic valves and vegetations using immunohistochemistry.

**Materials and Methods.** Aortic valves were obtained from nineteen patients diagnosed with IE during valve replacement surgery. Tissues were fixed in 10 % neutral formalin and paraffin-embedded, sectioned, and stained with haematoxylin and eosin (H&E) and immunohistochemically with anti-myeloperoxidase (MPO) and anti-histone H<sub>3</sub> antibodies. For both markers, the immunohistochemical expression was estimated semiquantitatively in aortic valve tissue and vegetation at 400× magnification. Expression was graded in four levels from "none" to "very high". Vegetation was stratified into 3 different parts: basal, middle, and distal. Neutrophils were scaled from 0 to 3: "0" – no neutrophils, "1" – 1-9 neutrophils, "2" – 0-49 neutrophils, and "3" – more than 50 neutrophils. Statistical analysis was done by SPSS 26.0.

**Results.** As many as 71 vegetation were observed in 19 valve samples; 23 (32%) of them were acellular, and 48 (68%) contained nuclear cells. Neutrophils were observed in 45 (63%); 5% of counted neutrophils were hypersegmented. Expression of myeloperoxidase was higher in all 3 parts of vegetation when compared to valve tissue – mean 1.09 and 0.63, respectively ( $p=0.018$ ). Expression of histone H<sub>3</sub> presented with the mean 0.96 ( $p<0.001$ ), and it was especially high in the distal part (mean 1.82,  $p<0.001$ ) when compared to the middle (mean 0.70) and basal (mean 0.34) part. There was a statistically significant positive correlation found between neutrophil count in vegetation and histone expression ( $+0.493$ ,  $p=0.032$ ).

**Conclusions.** A major portion of the vegetation studied contained neutrophils confirmed histopathologically. Myeloperoxidase and histone H<sub>3</sub> were highly expressed in vegetation structures.

## IMPLEMENTATION OF GENETIC TESTING OF HEREDITARY ANGIOEDEMA IN LATVIA – NOVEL VARIANT IDENTIFIED

Authors: *Karoline Schnitzler*<sup>1</sup>, *Jekatarina Isakova*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. Dr. med. *Natalja Kurjāne*<sup>2</sup>,  
Dr. med. *Inga Nartiša*<sup>2</sup>, Dr. med. *Adine Kanepa*<sup>2</sup>, Dr. med. *Linda Gailite*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia*

**Keywords.** Hereditary Angioedema, SERPING1.

**Objectives.** Hereditary Angioedema (HAE) is an inborn error of immunity and a rare autosomal dominant disorder that leads to recurrent episodes of severe edema. Type I and II are the most common forms and are caused by pathogenic variations in the SERPING1 gene, leading to a deficiency or dysfunction, respectively, of C1 inhibitor (C1-INH). Type III HAE can be caused by variations of the F12, PLG, ANGTP1 genes, but the complete etiology is not yet fully understood. Type III HAE has a regular C1-INH and protein complement levels, so a diagnosis can be confirmed only by gene sequencing. Aim: To implement genetic diagnostics of Hereditary Angioedema in Latvia.

**Materials and Methods.** In the study, 11 HAE patients from eight families were enrolled. DNA was isolated from peripheral blood. Sanger sequencing was performed for whole coding part of the SERPING1 (NG\_009625.1), ANGPT1 exon 9 (NG\_02905.1), PLG exon 2 (NG\_016200.1) and F12 gene exons 9-10 (NG\_007568.1). Sequence analysis were based on alignment to reference sequences using BLAST and pathogenicity were determined using American College of Medical Genetics (ACMG) criteria.

**Results.** From five index patients, HAE molecular diagnoses were confirmed in two families. In one case previously described pathogenic variant – NM\_000062.2(SERPING1):c.1396C>T,p.(Arg466Cys) was identified. In two individuals from one family a novel frameshift variant was detected: NM\_000062.3:c.1312del, p.(Val438PhefsTer12) – according to ACMG criteria it was classified as pathogenic based on criteria: PVS1\_Strong, PM1, PM2, PP1 un PP4. No pathogenic variants causing HAE type III were found.

**Conclusions.** Genetic testing for the HAE types was established in Latvia. This study identified one previously described and one novel SERPING1 pathogenic variants causing HAE. Currently, after we have established and validated the genetic testing for HAE, the genetic testing is ongoing for all HAE patients in Latvia.

# BIOCHEMISTRY, PHYSIOLOGY, PHARMACY, PHARMACOLOGY

## THE EFFECT OF CARAWAY, CHAMOMILE, AND ARTICHOKE BIOEXTRACTS ON THE LEVELS OF INTERMETABOLITES IN AN IN-VITRO MODEL

Author: *Theodore Liapman*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Jelena Krasilnikova*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Plants extracts, cholesterol, pyruvate.

**Objectives.** In recent years, the discovery of new economical active compounds for the correction of carbohydrate and lipid dysmetabolism has become a matter of high importance. Thus, there is a major interest in the identification and selection of plant bioextracts for the purpose of normalization of human metabolism and reduction of known side-effect. The objective of this research is to study the influence of the aforementioned bioextracts on the levels of intermetabolites, pyruvate (PV) and cholesterol (CHOL), in an in-vitro model of human blood. The research has been conducted as part of the LAAD project framework.

**Materials and Methods.** In our study, water-based extracts of caraway, chamomile, and artichoke (10%) were used in various volumes (50-2000 µL) on PV and CHOL containing blood models. The tests were conducted using standard biochemical methods: PV measurements were done with 2,4-dinitrophenylhydrazine colour spectroscopy, in normal and elevated PV models; CHOL - with the Liebermann-Burchard test. In hypo-, normo-, and hyper-CHOL-emia. Vitamin c concentrations were calculated in all extracts as well.

**Results.** All samples were induced with 100-2000µL of extract and showed increased PV levels in normal and elevated base PV levels. However, the most effective extract was the water-based caraway; by 298.8% and 127.4% respectively. Though all extracts demonstrated a tendency to elevate CHOL levels, less activity was shown by the caraway extract; 6% in normal CHOL levels and 10% in hyper-CHOL-emia. Vitamin C concentrations in all extracts were roughly the same at  $1.4 \pm 0.8 \text{mg\%}$ .

**Conclusions.** Of the tested extracts, the water-based caraway extract demonstrated the highest PV elevation. Hypothetically, improved cellular energy levels via utilization of PV may be achieved with these extracts. As vitamin c levels do not affect PV and CHOL levels, more detailed research should be conducted on the activity of polyphenols and other bioactive substances.

## ANTIOXIDANT AND ANTIRADICAL PROPERTIES OF BEER AND BEER DRINKS PRODUCED IN LATVIA

Author: *Inese Krumina*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Andrejs Šķesters*<sup>1</sup>,  
M. Chem. *Dmitrijs Kustovs*<sup>1</sup>, *Andrejs Šitovs*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Beer, antioxidants, polyphenols, DPPH, FRAP.

**Objectives.** Beer is one of the most commonly consumed alcoholic beverages. The negative effects of ethanol on human health have been demonstrated, but there are still few studies on other plant-based compounds in the final product and their effects on human health. Beer could be one of the antioxidant supplements for the body's internal antioxidant potency. Moderate beer consumption (10-15g / alcohol / day) reduces mortality.

**Materials and Methods.** Three non-alcoholic beer drinks, three light lagers, three dark lagers, three light ales, three dark ales, three India Pale ales as well as two Double India Pale ales were analyzed. To characterize the antioxidant and antiradical capacity in juices and relevant wines, we determined the polyphenol content using the Folin-Ciocalteu method, while the antiradical capacity was determined using the DPPH method, and the antioxidant activity - using the FRAP method. The data obtained in the study were processed and analyzed using Ms Excel program.

**Results.** Total phenolic content, antioxidative, and antiradical properties of the beer types differ. Dark beer shows the capability to reduce iron (III) ions, while light beer shows greater DPPH radical scavenging capability. Non-alcoholic beer drinks generally show much lower phenolic levels and antiradical activity.

**Conclusions.** Moderate consumption of beer as well as non-alcoholic beer high in antioxidants, could be a good addition to the body's internal antioxidant potency.

## THE STRESS SYNDROME EFFECT ON THE ANIMAL'S OBESITY DEVELOPMENT

Authors: *Daria Maryniak*<sup>1</sup>, *Vladyslav Yevtushok*<sup>1</sup>,  
*Oleksandr Svyryda*<sup>1</sup>, *Anastasiia Shkodina*<sup>1</sup>

Scientific research supervisors: *Marina Tsebenko*<sup>1</sup>, *Yuliia Chyzhanska*<sup>1</sup>

<sup>1</sup> *Ukrainian Medical Stomatological Academy, Ukraine*

**Keywords.** Body mass index, obesity, stress.

**Objectives.** WHO has recognized obesity as a new non-infectious epidemic of the 21<sup>st</sup> century. Global changes in mankind life and the influence of stress factors contribute to the development of the general adaptation syndrome.

**Materials and Methods.** The experiment was performed on 51 rats both sexes. They were divided into 4 groups: 1. intact (n = 10), 2. sodium-glutamate-induced obesity (n = 14), 3. stress syndrome (n=10) according to Selye by animal`s backs fixation 1 hour straight for 5 days, 4. stress syndrome on the background of obesity (n = 17). Subcutaneously groups 1 and 2 were injected at 2, 4, 6, 8, 10 days after birth with sodium-glutamate by 4 mg/g dose diluted in saline. For 4 months, animals had a normal diet in the vivarium. Slaughter of animals was performed by thiopental anaesthesia, bloodletting and visceral fat mass were measured. The body mass index (BMI) and obesity index (Lee index) was calculated. ANOVA and Bonferroni test was used to compare quantitative data.

**Results.** We found that animals with stress syndrome had an increasing amount of visceral fat, on the background of glutamate-induced obesity, compared with animals receiving neonatal administration of sodium-glutamate.

**Conclusions.** Stress syndrome leads to increase of the visceral part fat depot, on the background of glutamate-induced obesity, compared with a group of rats which simulated only obesity.

## CONTROLLED CRYSTALLINITY AND PROPERTIES OF CALCIUM PHOSPHATE BIOMATERIALS BASED ON DRYING CONDITIONS

Author: *Elīna Grandāne*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Agnese Brangule*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Hydroxyapatite, amorphous calcium phosphate, drying agents and conditions, biomaterials, Fourier transform infrared spectroscopy (FTIR).

**Objectives.** To design amorphous and crystalline calcium phosphate. To examine the effect of drying conditions on calcium phosphate structure and properties.

**Materials and Methods.** Synthesis. Wet precipitation synthesis at room temperature. The agents that were used: calcium nitrate tetrahydrate  $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ , concentrate ammonium solution  $\text{NH}_3 \cdot \text{H}_2\text{O}$ , diammonium hydrogen phosphate  $(\text{NH}_4)_2\text{HPO}_4$ , phosphate carbonate  $(\text{NH}_4)_2\text{CO}_3$  and distilled water  $\text{H}_2\text{O}$ . With these agents we get a suspension, then mixed for 10 minutes, used a precipitation filtration and washed with water, ethanol  $\text{C}_2\text{H}_5\text{OH}$  and acetone  $\text{C}_3\text{H}_6\text{O}$ . Drying. The samples were dried at room temperature, heated at 80, 120, 200, 900°C and lyophilised (freeze-drying at -50°C). Other samples were washed with ethanol and acetone and dried at room temperature. Analysis. Fourier transform infrared (FTIR) spectroscopy was used to get spectra and graphs. FTIR spectra were analysed in the region between 500 – 650  $\text{cm}^{-1}$ . There were analysed and compared  $\text{PO}_4^{3-}$  and  $\text{OH}^-$  groups.

**Results.** Analysis of the spectra in the  $\text{PO}_4^{3-}$  and  $\text{OH}^-$  group region showed: samples at room temperature, lyophilised and washed with organic solvents have an amorphous structure; at 120 and 200°C dried samples have a semi-crystalline structure; at 900°C have a completely crystalline structure.

**Conclusions.** According to application needs, changing the drying conditions makes it possible to control the degree of crystallinity of calcium phosphates. Using FTIR, it is possible to assess the degree of crystallinity of calcium phosphates. The most time-consuming drying method was lyophilisation. Samples dried under other conditions were ready to analyze after 24 hours.



## BONE STUDIES FOR BETTER BIOMATERIALS

Author: **Sanda Namiķe**<sup>1</sup>

Scientific research supervisor: Assist. Prof. **Agnese Brangule**<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Bones, calcium hydroxyapatite, calcium phosphate, biomaterials, Fourier-transform infrared spectroscopy (FTIR).

**Objectives.** Hydroxyapatite is widely used biomaterial for manufacturing various implants and prostheses due to its biocompatibility with human organism. By exploring materials available in nature, it is possible to develop and synthesize bone or tissue-like materials, that can be furthermore used to develop third-generation biomaterials.

**Objective.** Study the structure of animal bones and human bones using Attenuated Total Reflection Fourier-transform spectroscopy (ATR-FTIR) method and compare spectra with the synthesized calcium phosphate and collagen structure.

**Materials and Methods.** Materials: Bones of Latvia's ancient inhabitants (vertebrae and heel bone), beaver skull and front teeth, buffalo horn, deer bone and horn, mammoth bone, wild boar nail.

**Methods:** Attenuated Total Reflection Fourier FTIR. ATR-FTIR spectra were used to assess the chemical composition, structure of bones of biological origin and to compare them to the structure of synthesized calcium phosphate.

**Results.** A comparison between spectra recorded by ATF-FTIR sampling methods showed spectral diversity mainly due to the inorganic portion (i.e., phosphates and carbonates), which can remain relatively more stable than organic portion part under longer periods of time

**Conclusions.** The FTIR spectroscopy method may be used to identify and analyze bone materials. The FTIR spectra of archaeological bones are similar to the spectra of synthesized microcrystalline phosphate. The used material was sufficient to distinguish between: animal bone material and human bone material; the bone of the animal from the horns and tusks; to assess the age of human bones. Real bone material studies help to better understand to develop biomaterials with different uses.

## ANTIBACTERIAL PROPERTIES OF ZINC-DOPED HYDROXYAPATITES

Author: *Nikita Blohins*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Agnese Brangule*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Calcium phosphate (CaP), amorphous calcium phosphate (ACP), zinc-doped calcium phosphate, antibacterial properties, Fourier-transform infrared spectroscopy (FTIR), nanomaterials.

**Objectives.** The development of medicine sees an increased usage and need for biomaterials. One of the most promising areas of development in modern science is biomaterial research. Biomaterials are used in medicine to help with restoring organ functions or to facilitate their healing after diseases or injuries. One such material is hydroxyapatite. It is an important biomaterial used in human solid tissue regeneration, and its structure can be modified with several metal ions such as zinc. The data available in literature shows that at sufficient concentrations zinc ions exhibit antibacterial activity against several disease-causing agents such as *S. aureus*, which is a causative agent of many nosocomial diseases. The objective of this scientific study is to synthesise and analyse the antibacterial properties of zinc-doped hydroxyapatites depending on their zinc ion concentration.

**Materials and Methods.** In this work, three zinc ion-containing hydroxyapatite samples with zinc ion concentrations of 0.5% 1.0% and 5.0% were synthesised. Afterwards, the samples were pressed into tablets and their structures were analysed using attenuated total reflection Fourier-transform infrared spectroscopy, and X-ray fluorescence. The antibacterial properties of the samples against *S. aureus* were investigated.

**Results.** The samples were tested against *S. aureus*. A pure bacteria suspension with no samples was used as a control sample. After incubating for 24h, the control sample showed  $10^8$  colony forming units (CFU). Accordingly, all samples that presented a measurement below this level are considered to have antibacterial properties. The only sample that showed a measurable antibacterial activity was the sample with zinc ion concentration of 5.0% returning at  $10^6$  CFU.

**Conclusions.** The compound structure of the synthesised samples corresponds with the hydroxyapatite structure. The zinc-doped compounds exhibit antibacterial properties at zinc concentrations above 1.0%.

## THE EXPRESSION OF GABA AND GLUTAMATE TRANSPORTERS IN SIGMA-1 RECEPTOR KNOCK-OUT MOUSE BRAIN STRUCTURES

Author: *Rinalds Seržants*<sup>1</sup>

Scientific research supervisor: Dr. pharm. *Edijs Vāvers*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Latvian Institute of Organic Synthesis, Latvia*

**Keywords.** GABA, glutamate, transporters, sigma-1 receptor, knock-out.

**Objectives.** It has been demonstrated that sigma-1 receptor (Sig1R) is involved in the balance maintenance between excitatory and inhibitory mechanisms in the brain. Recently, it was shown that Sig1R antagonist NE-100 can inhibit transporter-mediated GABA and glutamate uptake in brain synaptosomes. Therefore, this study aimed to compare the GABA and glutamate transporter expression between wild-type (WT) and Sig1R knockout mice in different brain structures. In addition, we tested the activity of Sig1R antagonist BD-1047 on transporter-mediated GABA uptake.

**Materials and Methods.** Sig1R antagonist BD-1047 was used to validate the Sig1R inhibition-related transporter-mediated decrease of [<sup>3</sup>H]GABA uptake in rat brain synaptosomes. Quantitative PCR was used to evaluate the gene expressions of GABA transporters GAT1, GAT3 and VGAT, and glutamate transporters EAAT3, VGlut1 and VGlut2 in brain of CD-1 background WT and Sig1R knockout male mice. Western blotting and immunohistochemistry of free-floating sections were used to assess the protein expression of the astrocyte-related GABA transporter GAT3 and glutamate transporter EAAT2. Unpaired t-test or Mann-Whitney U test was used to compare differences between two independent groups by using the GraphPad Prism software package.

**Results.** BD-1047 at concentrations of 50 and 100 μM significantly inhibited transporter-mediated [<sup>3</sup>H]GABA uptake by 12% and 40%, respectively. The expression of GAT3, VGAT, EAAT3 and VGlut1 genes was similar in the cortex, hippocampus and the midbrain of Sig1R knockout and wild-type mice. Slight tendency of increased GAT1 and VGlut2 gene expression was observed only in the cortex of Sig1R knockout mice. The astrocyte-related GAT3 and EAAT2 protein levels did not differ in brains of wild-type and knockout animals.

**Conclusions.** Sig1R is not directly involved in the regulation of GABA or glutamate transport through modulation of plasma membrane and vesicular transporter expression. Sig1R antagonists may inhibit transporter activity through different intracellular signalling cascades.

## PRO-ATHEROGENIC METABOLITE TRIMETHYLAMINE N-OXIDE DOES NOT AFFECT BONE MARROW-DERIVED MACROPHAGE POLARIZATION

Author: *Reina Ambarova*<sup>1</sup>

Scientific research supervisor: Mg. pharm. *Melita Vidēja*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Latvian Institute of Organic Synthesis, Latvia*

**Keywords.** Trimethylamine N-oxide, BMDMs, inflammation, flow cytometry.

**Objectives.** Intestinal microbiota-dependent metabolite trimethylamine N-oxide (TMAO) is known to impact endothelial inflammatory injury and induce the release of inflammatory cytokines in vitro and in vivo, contributing to the development of atherosclerosis. Thus, this study aimed to investigate whether TMAO affects macrophage polarization towards pro-inflammatory (M1) and anti-inflammatory (M2) phenotypes.

**Materials and Methods.** Primary bone marrow-derived macrophages (BMDMs) were isolated from C57BL6/J mice femurs. The effect of TMAO on cell viability was determined spectrophotometrically using MTT assay. To test whether TMAO affects macrophage polarization, BMDMs were either incubated for 48h with TMAO only or preincubated with TMAO for 24h and further stimulated overnight with LPS (10 ng/ml)/IFN $\gamma$  (100 U/ml) towards differentiation to M1 phenotype or with IL-4 (10 ng/ml) towards the M2 phenotype. The expression of surface markers (CD80 and CD86 for M1; CD206 and CD301 for M2) was assessed using flow cytometry. Statistical analysis was performed using GraphPad Prism software.

**Results.** TMAO (up to 1 mM) did not affect macrophage viability. Therefore, 100  $\mu$ M and 1 mM concentrations were chosen for the following experiments. Flow cytometry analysis revealed that incubation of cells with TMAO does not affect the expression of M1 and M2 surface markers in non-stimulated BMDMs. In response to LPS/IFN $\gamma$ -stimulation, the number of CD80+CD86+ cells increased 4.5-fold (29%) compared to non-stimulated cells (6.5%). TMAO dose-dependently increased the population of CD80+CD86+ cells up to 36% ( $p < 0.05$ ). In IL-4-stimulated BMDMs, incubation with TMAO did not affect the percentage of CD206+CD301+ cells.

**Conclusions.** In concentrations up to 1 mM, TMAO is not toxic to BMDMs. TMAO itself does not induce inflammatory processes in macrophages, however, if inflammation-mediating signalling pathways are activated by other stimuli, TMAO can promote macrophage polarization towards pro-inflammatory phenotype. Acknowledgement: Latvian Council of Science project "Trimethylamine-N-oxide as a link between unhealthy diet and cardiometabolic risks" No. Izp-2018/1-0081.

## PATTERNS OF PRESCRIPTION DRUG MISUSE: A FORENSIC PERSPECTIVE

Authors: *Algirdas Konradas Liekis*<sup>1</sup>, *Ignas Planutis*<sup>1</sup>  
Scientific research supervisor: PhD *Jurgita Stasiūnienė*<sup>1</sup>

<sup>1</sup> *University of Vilnius, Lithuania*

**Keywords.** Drug abuse, prescription drugs, poisoning, overdose, fatal.

**Objectives.** Prescription drug abuse is an alarming public health danger and a constant concern of prescribing physicians. The aim of the study was to identify the most commonly misused groups of prescription medications and the most common medications within those groups, as well as the characteristics of the deceased themselves, such as the average age and sex.

v. We identified and retrieved from the State Forensic Medicine Agency depersonalised autopsy records of cases of death in which prescription drug intoxication was involved. 89 records fitting our criteria of prescription drug presence were selected, from a dataset of 241 cases of intoxication deaths. The data was analysed with R commander.

**Results.** From the 89 deceased persons identified in the analysis the average age was 39.5. 75,28% (67) were men and 24.72% (22) were women. It was determined, that the direct cause of death involved prescription drug toxicity in 33 (37.07%) cases, in 28 (31.46%) cases alcohol played a part, while illicit narcotics were involved in the cause of death in 30 cases. Other mechanisms of death were determined in 36 cases. 53 of the persons died due to substance toxicity. The most frequently encountered prescription drugs were the benzodiazepine class (62 cases), diazepam being the most common (28 cases). The second most numerous group was antipsychotics (20 cases), the most common being quetiapine (8 cases), followed by antidepressants (18) the most common being amitriptyline (5 cases) Anti-epileptic drugs - 11 cases, 10 of which involved carbamazepine.

**Conclusions.** The majority of the deceased were men, with an average age of 39.5 years. The most frequently encountered group of drugs were the benzodiazepines, the most common of which was diazepam, followed by antipsychotics, the most common being quetiapine.

## KNOWLEDGE AND PRACTICE OF COMMUNITY PHARMACISTS TOWARDS RATIONAL USE OF ANTIBIOTICS AND DISPENSING PRACTICE OF ANTIBIOTICS IN LATVIA

Author: *Laura Repele*<sup>1</sup>

Scientific research supervisor: Mg. pharm. *Ieva Rutkovska*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Antibiotics, antimicrobial resistance, prescription.

**Objectives.** Combating antimicrobial resistance (AMR) is one of the main global health priorities. Inappropriate use of antibiotics exacerbates AMR. According to Eurobarometer 478, which was conducted in 2017 in the EU, Latvia had one of the highest proportion of antibiotics that are dispensed without a prescription (13%). Pharmacists play an important role in the prudent use of antimicrobials, but pharmacies may be one of the places where patients may get antibiotics without a prescription.

The aim of this descriptive cross-sectional study was to assess pharmacist's general knowledge about antibiotics and their dispensing practice of antibiotics.

**Materials and Methods.** An online survey with 27 questions was conducted in November 2020. Data were collected from 154 survey participants and analyzed using the frequency analysis method within IBM SPSS Statistics.

**Results.** Surveyed pharmacists' knowledge on antibiotics were generally high according to the Eurobarometer questionnaire on knowledge about antibiotics, where 80,4% had fully correct answers. Pharmacists stressed concerns regarding pressure and demand for antibiotics from their patients. 43,8% of respondents indicated that they know patients that have used antibiotics without a prescription within the last month, which is a higher rate than in the Eurobarometer survey. They also noted that within the last month 1-5 patients have asked them to dispense antibiotics without a prescription, very few (<2%) indicated that they have dispensed antibiotics in such situations and overall pharmacists do not support such practice and admit that they are concerned about the rational use of antibiotics.

**Conclusions.** The knowledge of surveyed pharmacists is considered to be high. Furthermore, there is a large proportion of patients demanding antibiotics without a prescription, putting pressure on pharmacist daily work. Surveyed pharmacists noted that patients get antibiotics somewhere else, not from them.

# INFECTIOUS DISEASES, DERMATOVENEROLOGY, MICROBIOLOGY, IMMUNOLOGY, ALLERGOLOGY

## INFLUENCE OF A VITAMIN C CONTAINING COSMETIC PRODUCT ON THE BIOPHYSICAL PARAMETERS OF THE SKIN

Author: *Anete Erta*<sup>1</sup>

Scientific research supervisor: Dr. *Aleksejs Zavorins*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Vitamin C, cosmeceuticals, skin hydration, skin radiance, skin tone, skin elasticity.

**Objectives.** Vitamin C is potent and abundant antioxidant in human skin. Due to its antioxidative, photoprotective and skin lightening properties it is widely used in cosmeceuticals. The objective of this study was to evaluate impact of a vitamin C containing cosmetic product on the biophysical parameters of the skin: hydration level, radiance, skin tone and viscoelasticity.

**Materials and Methods.** Approval of Rīga Stradiņš University Ethics Committee was acquired (27.02.2020. No.6-1/02/40). A randomised, double blind, placebo controlled trial was performed over 4-week period. Each night vitamin C group (N=51) applied cosmetic formula containing vitamin C (ascorbyl palmitate, ascorbyl glucoside) on the facial skin, meanwhile control group (N=29) applied inactive formula. Additionally both groups applied sunscreen in the mornings. Instrumental assessment to evaluate skin hydration level, radiance, color and viscoelastic parameters was performed using Corneometer®, Glossymeter®, Colorimeter® and Cutometer® respectively on the cheek area before and after 4-week period of daily applications. Between-group differences were assessed by independent T-test, whereas within-group differences by paired T-test. P value < 0,05 was considered statistically significant.

**Results.** Statistically significant differences between groups were seen regarding viscoelasticity parameters R2 (p<0,001), R5 (p=0,009), R7 (p<0,001) showing decline in the control group. After a 4-week period in the control group R2, R5, R7 parameters as well as the skin radiance (from 3,66 to 3,24, p=0,029) were statistically significantly lower compared to the baseline values. In vitamin C group hydration level improved (from 53,31 to 58,73, p=0,039) and skin was lighter due to the increase in skin color parameter ITA (from 33,78 to 35,41, p=0,027) compared to the baseline values.

**Conclusions.** 4-week daily regimen of topical Vitamin C application improves viscoelastic parameters of the skin by preventing loss of the elasticity.

## COMMON VARIABLE IMMUNODEFICIENCY (CVID) IN LATVIA

Author: *Violeta Zubkova*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Natalja Kurjane*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Common variable immunodeficiency, immunoglobulins, autoimmunity, chronic inflammatory diseases, granulomatous diseases.

**Objectives.** Common variable immunodeficiency (CVID) is a common primary immunodeficiency in adults characterized by a failure in B-cell differentiation with defective immunoglobulin production. CVID patients are susceptible to recurrent infections and have an increased risk for the development of chronic inflammatory and autoimmune manifestations, as well as lymphoproliferation and granulomatous inflammation.

The aim of this study was to investigate patients with diagnosed CVID in Latvia: the clinical and immunological signs.

**Materials and Methods.** 24 patients were diagnosed with CVID in Latvia according to the criteria of European Society of Immunodeficiency during the period from 1994 until 2020. Retrospective study was performed where were analysed immunological blood tests and clinical histories of these patients.

**Results.** Mean age of CVID diagnosis was 47 years  $\pm$  14. Diagnostic delay was from several months till 38 years (mean, 12 years). Clinically, CVID patients have had recurrent infections such as pneumonia, pleuritis, bronchiectasis, bronchitis, asthma, purulent sinusitis, otitis, furunculosis, recurrent lymphadenitis. Also some of them had autoimmune diseases such as diabetes mellitus and celiac disease. 2 patients had lymphoproliferative disorders such as Hodgkin and Non-Hodgkin lymphoma. The laboratory tests showed hypogammaglobulinemia with the variable changes in cell immunity. IgA was performed in all cases and the mean IgA was 0.07 (normal ranges 0.3-0.5 g/l), mean level of IgG was 1.97 (normal range is 8.0-16.0 g/l) and IgM – 0.16 (normal range 0.3-3.0 g/l).

**Conclusions.** The diagnosis of CVID is commonly delayed and usually diagnosed in advanced stage. Timely diagnosis and replacement antibody therapy reduces the risk of the development of the complications of this disease. However, underlying reasons for the uncommon manifestations associated with CVID, such as granulomatous inflammation or lymphoproliferative diseases, are unknown and need further genetic research.



## PREVALENCE OF MUPIROCIN RESISTANCE AMONG COMMUNITY AND NOSOCOMIAL STAPHYLOCOCCUS AUREUS STRAINS IN VILNIUS

Authors: **Jakob Lindemann**<sup>1</sup>, **Paul Kleier**<sup>1</sup>

Scientific research supervisors: Dr. **Purakevič Olga**<sup>2</sup>, Assoc. Prof. **Agnė Kirkliauskienė**<sup>2</sup>

<sup>1</sup> Vilnius University, Lithuania

<sup>2</sup> Vilnius University, Institute of Biomedical science, Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Lithuania

**Keywords.** Mupirocin resistance, Vilnius Lithuania, EUCAST 2020, Staphylococcus aureus, Disk diffusion test.

**Objectives.** *Staphylococcus aureus* infections are one of the most common and serious community and hospital-acquired infections. Increased prevalence of staphylococcus infections are attributed to its carriage in anterior nares, hands of health care workers and patients. Eradicating nasal carriage of *S. aureus* in adult patients and health care personnel reduces the risk of infection among patients. Topical mupirocin is used widely to treat skin and soft tissue infections and to eradicate nasal carriage of methicillin-sensitive *Staphylococcus aureus* (MSSA) and methicillin-resistant *Staphylococcus aureus* (MRSA).

**Materials and Methods.** Nosocomial *S. aureus* strains were collected from clinical specimens from September 2018 to February 2019. Community strains – from October 2019 to February 2020. All *S. aureus* strains were stored at Vilnius University Faculty of Medicine. Disc diffusion tests were carried out according to the guidelines of the European Committee on Antimicrobial Susceptibility Testing (EUCAST, 2020).

**Results.** A total of 220 *S. aureus* strains were investigated. Among 112 nosocomial *S. aureus* strains, 11.6% (n=13) were MRSA. *S. aureus* isolates were obtained in highest number from wounds swab (51.7%) followed by pus (17.9%), blood (14.3%), tracheal aspirate (12.5%) and urine (3.6%). Among 108 community MSSA strains, 70.4% were isolated from healthy respondents' nose and 29.6% from throat. All 220 *S. aureus* strains tested for mupirocin resistance with 5 and 200 µg discs had a zone >14 mm.

**Conclusions.** No low and high-level resistant strains were determined among community and nosocomial *Staphylococcus aureus* strains. Topical mupirocin can be successfully used to treat skin and soft tissue infections and to eradicate nasal carriage of MSSA and MRSA in especially high-risk populations like Lithuania.

## MICROBIAL COLONIZATION OF SPORTSMEN'S MOUTH GUARDS

Author: *Aleksandra Kamenska*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Ingus Skadiņš*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Mouth guard, *S.aureus*, *R.dentocariosa*.

**Objectives.** The use of removal mouth guards may affect the oral cavity microbiota. Teeth-contacting surface on mouth guard represents both environmental and local oral microorganisms, which can be sampled and identified. The aim of the study was to identify microorganisms colonising teeth-contacting surface of sportsmen' mouth guards.

**Materials and Methods.** The study included samples from the teeth-contacting surface of 33 mouth guards belonging to healthy sportsmen. 26 men and 7 women participated in the study with the median age of 31 years (range 11 to 48). The samples were inoculated and cultivated on *Blood*, *Mannitol* and *Sabouraud* agar following standard protocol. After macroscopic examination, colonies were stained using Gram or methylene blue stain. VITEK2 identification system was used for bacteria identification.

**Results.** Colonies formed on 33 out of 33(100%) *Blood* agars, 25/33 (76%) *Mannitol* and 26/33 (79%) *Sabouraud* agars. Yeasts were found on 25/33 (76%) and filamentous fungi were present on 6/33 (18%) *Sabouraud* agars. It was possible to identify 17 species of bacteria, 12 Gram-positive and 5 Gram-negative. 27/33 (82%) samples were proved to contain Gram-positive bacteria, and species of Gram-negative bacteria were identified on 8/33 (24%) mouth guards. *S.aureus* and *R.dentocariosa* were the most frequent species of Gram-positive bacteria, each found on 9/33 (18%) mouth guards. *A.salmonicida* and *S.maltophilia* were present in 6/33 (6%) samples, making them the most frequent species of Gram-negative bacteria.

**Conclusions.** Teeth-contacting surface of mouth guards was colonised by bacteria, yeasts and filamentous fungi. Gram-positive bacteria were found more frequently than Gram-negative bacteria. Among identified microorganisms, the most common bacteria were *S.aureus*, *R.dentocariosa*, *A.salmonicida*, *S.maltophilia*.

## THE SHIFT OF ANTIMICROBIAL SUSCEPTIBILITY IN ENTEROCOCCUS SPP. CLINICAL ISOLATES IN THE PERIOD OF 2017 TO 2019

Authors: *Kirils Jeršovs*<sup>1</sup>, *Aleksandra Kamenska*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Aigars Reinis*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Antimicrobial resistance, *Enterococcus* spp.

**Objectives.** Misuse of antibiotics in clinical practice significantly contributes to the rising antimicrobial resistance which ultimately cuts down the efficiency and options for antimicrobial therapy. The aim of the study was to analyze the change of antimicrobial susceptibility of *Enterococcus* spp. clinical isolates from Pauls Stradiņš Clinical University Hospital (PSKUS) in the period of 2017 to 2019.

**Materials and Methods.** The retrospective study included information about 2353 *Enterococcus* spp. clinical isolates sorted by DiaLab database. Antibacterial resistance was identified and assessed using the current version of the EUCAST recommendations. Statistical analysis was performed with IBM SPSS Statistics 22. Pearson's chi-squared coefficient and Fisher transformation were used.

**Results.** A group containing all of researched *Enterococcus* spp. clinical isolates showed a statistically significant difference in susceptibility to Ciprofloxacin ( $p=0.035$ ) and Vancomycin ( $p<0.001$ ). *Enterococcus faecalis* clinical isolates showed a statistically significant difference in susceptibility to Ampicillin ( $p<0.001$ ), Ciprofloxacin ( $p<0.003$ ), Norfloxacin ( $p=0.003$ ), Vancomycin ( $p<0.001$ ). *Enterococcus faecium* clinical isolates showed a statistically significant difference in susceptibility to Gentamicin ( $p=0.001$ ), Nitrofurantoin ( $p=0.034$ ), Vancomycin ( $p=0.01$ ).

**Conclusions.** In the period of 2017- 2019 a group that contained all of the researched *Enterococcus* spp. clinical isolates showed increased susceptibility to Vancomycin as well as decreased susceptibility to Ciprofloxacin. *Enterococcus faecalis* clinical isolates showed increased susceptibility to Ampicillin, Ciprofloxacin, Norfloxacin and Vancomycin. *Enterococcus faecium* showed a decreased susceptibility to both Gentamicin and Nitrofurantoin as well as increased susceptibility to Vancomycin.

## ANTIMICROBIAL SUSCEPTIBILITY PATTERN ANALYSIS AMONG KLEBSIELLA SPP. CLINICAL ISOLATES IN THE PERIOD OF 2017 TO 2020

Authors: *Kirils Jeršovs*<sup>1</sup>, *Aleksandra Kamenska*<sup>1</sup>  
Scientific research supervisor: Assist. Prof. *Aigars Reinis*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Klebsiella, ESBL, antimicrobial susceptibility.

**Objectives.** The rising of antimicrobial resistance among clinical isolates has caused considerable challenge to physicians due to lack of therapeutic options. The aim of study was to analyze antimicrobial susceptibility patterns among *Klebsiella spp.* clinical isolates in Paul Stradiņš Hospital (PSKUS) in two periods (2017/2018 and 2019/2020).

**Materials and Methods.** The retrospective research included information about 1868 *Klebsiella spp.* clinical isolates sorted by *DiaLab* database. Antibacterial resistance was identified and assessed using the current version of the EUCAST recommendations. Statistical analysis was done with IBM SPSS Statistics 22. Pearson's chi-squared coefficient and Fisher transformation were used.

**Results.** Among all *Klebsiella spp.* statistically significant differences in susceptibility to Amikacin ( $p < 0,001$ ), Meropenem ( $p = 0,029$ ), Piperacillin-Tazobactam ( $p = 0,001$ ), Chloramphenicol ( $p < 0,001$ ) were observed: the isolates were more susceptible in the first period. A statistically significant difference in incidence of ESBL positive isolates was not found between two periods ( $p = 0,086$ ). The comparison of ESBL positive and negative *Klebsiella spp.* isolates of both periods showed a significant difference in susceptibility to beta-lactam antibiotics such as Amoxicillin-Clavulanic acid ( $p < 0,001$ ), Ceftazidime ( $p < 0,001$ ), Cefotaxime ( $p < 0,001$ ), Meropenem ( $p < 0,001$ ), Piperacillin-Tazobactam ( $p < 0,001$ ) and non-beta-lactam such as Amikacin ( $p < 0,001$ ), Ciprofloxacin ( $p < 0,001$ ), Gentamicin ( $p < 0,001$ ), Nitrofurantoin ( $p < 0,001$ ), Trimethoprim-Sulfamethoxazole ( $p < 0,001$ ).

**Conclusions.** During the period from 2017 to 2020 *Klebsiella spp.* clinical isolates showed increased susceptibility to amikacin, meropenem, piperacillin-tazobactam and chloramphenicol. Statistically significant increase in ESBL producing isolates was not observed. ESBL positive *Klebsiella spp.* isolates showed higher resistance to both beta-lactam and non-beta-lactam comparing to ESBL negative isolates.

## ANTIBACTERIAL EFFECT OF ESSENTIAL OILS AGAINST CAUSATIVE AGENTS OF PERIODONTITIS AND GINGIVITIS

Author: *Darja Gvergžde*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Ingus Skadiņš*<sup>1</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Gingivitis, periodontitis, essential oils, pathogenic microorganisms.

**Objectives.** Periodontal diseases have both local and systemic impact on the human health. According to global statistics, gingivitis and periodontitis can be found in 50-100% and 20-50% of adult population, respectively. To control and eradicate the bacteria, which cause these diseases, intervention with bactericidal substances have been proved to be necessary. Nowadays chlorhexidine is regarded as preferable agent, however, it can cause many side effects. Essential oils are considered to be safer for the human health with a smaller amount of side effects and considerable bactericidal effect. The objective of this study was to isolate and identify causative agents of periodontitis and gingivitis and to examine the bactericidal effect of essential oils against the identified microorganisms.

**Materials and Methods.** Samples were collected from gingival pockets using paper points. Collected samples were cultivated on blood agar under anaerobic conditions at 37°C. Identification was performed using morphological analysis and identification with VITEK2. Sensitivity of microorganisms against 0,5% emulsion of essential oils from *Syzygium arimaticum*, *Melaleuca alternifolia* and *Eucalyptus obliqua* was tested using disc diffusion method and compared against chlorhexidine 0,2% and 2% as control group.

**Results.** After the cultivation 8 different bacterial colonies were identified but the data regarding sensitivity to the used agents could be collected only from the 6 of them: *St. Angino*, *St. Oralis*, *St. Sanguis*, *K. sedentarius*, *A. Naslundii*, *A. Odontolyticus*. After applying a bactericidal agents average sterile zone diameter on all bacterial colonies of chlorhexidine 0,2% was 13,50±3,99 millimeters and chlorhexidine 2% was 21,11±3,80 millimeters. Meanwhile all the samples that were exposed to any of the essential oil emulsions resulted in a sterile zone diameter being 0 millimeters.

**Conclusions.** Out of 6 responsive bacterial colonies essential oils proved to have no bactericidal effect.

## MICROBIAL CONTAMINATION IN MUSEUM STOREROOM AIR

Authors: *Elizabete Veignere*<sup>1</sup>, *Renāta Rimdjonoka*<sup>1</sup>

Scientific research supervisors: Assist. Prof. Dr. med. *Žanna Martinsone*<sup>1</sup>,  
Assist. Prof. *Ingus Skadiņš*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Fungus, indoor, air quality, museum storerooms.

**Objectives.** The commonly found fungi in indoor air are *Penicillium spp.*, *Aspergillus spp.*, *Cladosporium spp.*, *Alternaria spp.* All of these fungi are part of normal air microbiota. They are more widespread in outdoor air, but are also present in indoor air. The main aim of this study was to determine if the indoor air in museum storerooms had fungal contamination that exceeded the guidelines.

**Materials and Methods.** For this study, we took 24 samples from 8 different newly built museum storerooms using "SAS SUPER ISO 100". The samples were cultivated on *Sabouraud* agars. All the colonies were counted and then identified using native smears (wet mount slides) and staining using safranin. This study was supported by Rīga Stradiņš University Vertical integrated projects (VIP).

**Results.** After inoculation of the samples that we took from the indoor air in museum storerooms, colonies formed on 23 out of the 24 *Sabouraud* agars. The colony forming units per cubic meter (CFU/m<sup>3</sup>) fluctuated between 0-42 CFU/m<sup>3</sup>. All the identified fungi belonged to *Mucor spp.*, *Aspergillus spp.*, *Penicillium spp.* and *Candida spp.* More than half of the identified fungi belonged to *Mucor spp.*

**Conclusions.** All of the fungi found in the indoor air samples are part of normal air microbiota. The fungi colony forming units per cubic meter in the samples did not exceed 50 CFU/m<sup>3</sup>, which means that the tested indoor air has very low microbial pollution. Almost all the fungi found were molds (*Mucor spp.*, *Penicillium spp.*, *Aspergillus spp.*), except for two colonies, which were yeasts (*Candida spp.*). During the information collection we found that Latvia has no specific guidelines for the allowed amount of microbial contamination in both indoor and outdoor air. In the future these guidelines could and should be developed more.

## THE EFFECTIVENESS OF SYSTEMIC THERAPY AND THE IMPACT ON LIFE QUALITY IN PATIENTS WITH MODERATE-TO-SEVERE PSORIASIS

Author: *Anna Kobenko*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Ingmārs Mikāžāns*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Outpatient Clinic, Pauls Stradiņš Clinical University Hospital, Clinic for Dermatology and STD, Latvia*

**Keywords.** Moderate-to-severe psoriasis, systemic therapy, PASI index, DLQI scale, EQ-5D-5L scale.

**Objectives.** Psoriasis is one of the most common chronic dermatosis. It has significantly negative impact on patient's health related quality of life, causing social and psychological problems. The aim of the research was to analyse changes of PASI index and find correlation between PASI and quality of life using DLQI and EQ-5D-5L in patients with moderate-to-severe psoriasis that have been under continuous systemic treatment for at least 24 weeks.

**Materials and Methods.** 35 patients with moderate-to-severe psoriasis were measured with PASI, DLQI and EQ-5D-5L scales. Statistic analysis was performed using Word Excel 2013 and IMB SPSS 1.0.0.1447, with help of Spearman's rho and Wilcoxon tests.

**Results.** 24 men and 11 women were analysed. Average patient's age was 46.23 years. Mean PASI score before systemic therapy was 18,326, mean PASI after 24 weeks of treatment was 4,0743. Difference between PASI before and after treatment is statistically significant ( $p=0,000$ ). There was found statistically significant weak negative correlation between PASI after systemic therapy and quality of life (EQ-5D-5L) ( $r(35)=-0,338$ ;  $p=0,047$ ). Statistically significant strong positive correlation was found between PASI after systemic therapy and quality of life (DLQI) ( $r(35)=0,676$ ;  $p=0,000$ ).

**Conclusions.** Systemic therapy significantly reduces PASI score. Treatment with systemic therapy improves quality of life in patients with moderate-to-severe psoriasis. PASI, DLQI and EQ-5D-5L scales can be used as severity and life quality analysis tool for patients with moderate-to-severe psoriasis.

## TOXOCARIOSIS SEROPREVALENCE IN THE POPULATION OF LATVIA

Author: **Simona Rubine**<sup>1</sup>

Scientific research supervisors: Prof. **Angelika Krūmiņa**<sup>1,2</sup>, Dr.biol. **Gunita Deksnē**<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Institute of Food Safety, Animal Health and Environment "BIOR", Latvia*

**Keywords.** Toxocariosis, seroprevalence, general population.

**Objectives.** *Toxocara* spp. are parasitic nematodes, that cause toxocariosis in humans. Infection is distributed worldwide. Toxocariosis in humans can be seen as ocular toxocariosis, visceral larva migrans, neurotoxocariosis and covert toxocariosis. Data about seroprevalence in population of Latvia is limited. The aim of this study is to assess the seroprevalence of specific anti-*Toxocara* IgG antibodies in general population in Latvia during 7-year period (2014-2020) and to identify the contribution of changes in patient's general health potentially associated with *Toxocara* seropositivity.

**Materials and Methods.** The data for present study was collected from 4144 patients routinely tested for the presence of specific anti-*Toxocara* IgG antibodies. All patients were evaluated for the presence of specific anti-*Toxocara* IgG antibodies at first diagnosis, age, gender, geographical region, biochemical and haematological parameters which help to assess possible organism pathologies.

**Results.** The overall specific anti-*Toxocara* IgG seroprevalence was observed 70.5% (CI 69.1-71.9%) - reaching 80.2% (CI 74.6-85.0) in the age group 8-14 years. Significantly higher ( $p < 0.01$ ) anti-*Toxocara* IgG seroprevalence was observed in males (73.5%, CI 71.4-75.6) compared to that observed in females (68.3 %, CI 66.4-70.1 %). Significantly higher ( $p < 0.05$ ) seroprevalence was observed in Latgale region (94.1%, CI 92.9 - 95.2). High total immunoglobulin E titer was more often observed in seronegative patients ( $p = 0.002$ ). 30.6% of patients had positive anti-*Toxocara* IgG and elevated total serum IgE.

**Conclusions.** The results of this study shows that specific anti-*Toxocara* IgG antibodies are prevalent in general population of Latvia, especially in Latgale region, and more prevalent in children. Patients who have elevated serum total IgE and positive anti-*Toxocara* IgG could have *Toxocara* invasion, as one of the causes of elevated total IgE is parasitic infections. Further investigations are needed to determine the actual prevalence of toxocariosis and caused health issues from it in the population of Latvia.



## MICROBIAL COLONIZATION OF USED FACE MASKS

Author: *Katrīna Tomiņa*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Ingus Skadiņš*<sup>1</sup>,  
Mg.biol. *Anastasija Dovbenko*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

**Keywords.** Face masks, microbial colonization.

**Objectives.** Face masks are used as a prophylactic method against transmission of different airborne infections and have become a habitual part of everyday life during the COVID-19 pandemic. Lack of effort and inappropriate face mask use increases the risk of potentially pathogenic microorganism transmission. Therefore, the aim of this study was to investigate the microbial colonization of used face masks.

**Materials and Methods.** In this study, 51 used face masks were analysed. Bacterial and fungal colonization was tested by using imprinting method on blood agars and *Sabouraud* agars, both sides of the masks were tested separately. After incubation, the number of colony-forming units (CFUs) was determined. Morphological growth evaluation followed by staining with Gram stain for bacteria and methylene blue for yeasts was performed. For bacterial identification, VITEK2 was used.

**Results.** Bacterial colonization was detected on all 51 of the used face masks, both on the inside and outside. Fungal colonization was detected on 32 (62.7%) of the facial masks, for 29 (56.8%) masks on the outside and for 25 (49.0%) - on the inside. The majority of bacteria found were Gram positive. On *Sabouraud* agars molds were more commonly detected. Overall most commonly found bacteria were *Staphylococcus* spp. (100%, n=51), followed by *Micrococcus* spp. (96%, n=49). Most frequently found Gram negative bacteria were *Sphingomonas* spp., *Moraxella* spp. and *Pseudomonas* spp. The median bacterial CFUs scored were  $2 \times 10^2$  for the outsides and  $6 \times 10^2$  for the insides of the facial masks. A greater variety of bacterial species was found on the outsides of the facial masks.

**Conclusions.** The majority of microorganisms found on the used face masks were those of normal human skin and respiratory tract microbiota although extraneous microorganisms were also found. More CFUs were detected on the insides of the face masks, but the outsides contained a wider variety of species.

## E.COLI ABILITY TO FORM BIOFILMS

Authors: **Elizabete Rapa**<sup>1</sup>, **Laura Agnese Pauliņa**<sup>1</sup>

Scientific research supervisor: Assist. Prof. **Ingus Skadiņš**<sup>2</sup>,  
Mg.biol. **Anastasija Dovbenko**<sup>2</sup>

<sup>1</sup>Rīga Stradiņš University, Latvia

<sup>2</sup>Rīga Stradiņš University, Department of Biology and Microbiology, Latvia

**Keywords.** *Escherichia coli*, biofilms.

**Objectives.** *Escherichia coli* (*E. coli*) is a Gram-negative bacteria that is commonly found in the lower intestine of warm-blooded organisms. Most *E. coli* strains are harmless, but some can be pathogenic and cause infections. Bacteria that are able to form biofilms are known to be more antibiotic resistant. That is one of the reasons why there is an antibiotic resistance problem with *E. coli* related infections. The goal of this study was to determine the ability of *E.coli* to form a biofilm.

**Materials and Methods.** This study analysed 166 *E. coli* cultures that were isolated from patient materials. Biofilm formation activity was determined by crystal violet binding assay. For this method we used 96-well microliter plates that were filled with 200µl *E.coli* sample suspension with dilution 1:100. Each microliter plate also contained reference *E.coli* strain (ATCC-25922) as positive control. Results of biofilm production activity was obtained by measuring optical density with ELISA Reader at 540 nm wavelength. All experiments were done in triplicate. Each *E. coli* strains' biofilm production activity was assessed by calculating each samples' mean density ratio to negative controls' mean density result.

**Results.** According to the obtained data, the bacteria strains were divided into four groups – “strong”, “moderate”, “weak” and “none” biofilm producers. Results showed that 12,7% (12 out of 166) *E.coli* strains were with strong biofilm production activity, 40,4% strains (67 out of 166) were moderate biofilm producers and 43,4% (72 out of 166) strains had weak biofilm production activity. Out of 166 *E.coli* strains, 6 cultures did not show any biofilm production activity (3,6%).

**Conclusions.** From all 166 cultures more than half of *E.coli* strains were with strong or moderate biofilm production activity. That could be the possible cause for ineffective antibiotic therapy in hard to treat *E.coli* infection cases, therefore treatment therapy correlations should be made in such cases.

## FACE MASKS INDUCED CONTACT DERMATITIS AMONGST MEDICAL PERSONAL AT THE CLINIC OF EMERGENCY MEDICINE AND PATIENT ADMISSION "GAILEZERS" DURING COVID-19 PANDEMIC

Author: *Demija Pleša*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Elga Sidhoma*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Dermatology and Venereology, Latvia*

**Keywords.** Contact dermatitis, face masks, COVID-19 pandemic.

**Objectives.** At the beginning of the COVID-19 pandemic and with the declaration of state quarantine, the medical staff of the Clinic of Emergency Medicine and Patient Admission "Gailezers" was required to use personal protective equipment, including the use of a respirator. The aim of the study is to find out whether the use of respirators affects the condition of the facial skin and causes contact dermatitis to medical staff.

**Materials and Methods.** An anonymous questionnaire was used, which included 20 questions, and 53 medical professionals of the Clinic of Emergency Medicine and Patient Admission "Gailezers" (women (n=37), men (n=16) ) were surveyed. In the prospective part of the research - during the month of January 2021 (5.01.-31.01.2021.) one research participant filled in the questionnaire with four questions after each 24-hour shift in the hospital.

**Results.** In the study of 53 participants, in 71.2% of the cases respirators caused changes in facial skin condition. The most common region that was affected was the perioral area. The most common changes caused by respirator use were redness of the skin - 67.3% and itch of the face and neck skin - 57.1%. 76.9% of the surveyed medical staff observed itch and 33.3% of the participants assessed the itch as moderately intense. 50% of the respondents reported that changes were observed using an FFP3 respirator.

**Conclusion.** The use of a respirator can cause contact dermatitis to medical professionals after long-term use, which manifests as itchy skin of face and neck, redness of the skin and xerosis in most cases.

## ITCH IN PSORIASIS AND ITS CONTRIBUTING FACTORS

Authors: *Demija Pleša*<sup>1</sup>, *Vita Trone*<sup>1</sup>

Scientific research supervisor: Prof. *Jānis Ķīsis*<sup>1</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Itch, pruritus, psoriasis.

**Objectives.** Psoriasis is a chronic inflammatory dermatosis, frequently presenting with chronic itch. Pruritus may be severe and seriously affect the quality of life of patients. Most psoriatic patients have a defective protective barrier that is easily permeable to allergens in the environment, including those that can cause itching. The study evaluated objective, molecular factors and laboratory parameters associated with the disease..

**Materials and Methods.** Retrospective study - review and analysis of laboratory examinations from the patient histories of Prof. Jānis Ķīsis patients who were diagnosed with psoriasis in the period from January 2015 to November 2020. In the prospective part in 2021, we will conduct a survey for psoriasis patients to find out their quality of life in relation to itching before starting treatment.

**Results.** The study included 435 patients- men (n= 245) and women (n= 190). The groups of men and women were further divided into age groups. The first group included patients aged 18 to 50, while the second group included patients aged 51 and older. 18 laboratory parameters were analyzed from patient medical histories. According to the obtained data, a correlation was observed that for both women (35.7%) and men (38.3%) the ASO values in the age group 18 to 50 are above the norm (p= 0.002), compared to the age group 51 and older (p= 0.026). Low levels of HDL contribute to weakening of protective gear, for both women and men aged 18 to 51, HDL was below normal (women= 86.1%; men= 83%) and for age group 51 and older (women= 76.5%; men= 86.2%).

**Conclusion.** Following a summary of the data performed, it may be encouraged that itching may be increased by abnormalities in laboratory parameters, which indicates a reduction in the functions of protective barriers, a systemic inflammation that allows personalized medicine in psoriasis patients to reduce the severity of psoriasis and pruritus.

## A RETROSPECTIVE STUDY OF ANTIMICROBIAL RESISTANCE OF VIBRIO CHOLERAЕ O1 SEROTYPE OGAWA IN THE 2018 CHOLERA OUTBREAK IN HARARE

Author: *Albert Kamuriwo*<sup>1</sup>

Scientific research supervisor: Prof. *Mazuru Gundidza*<sup>1</sup>

<sup>1</sup> *Harare Institute of Technology, Zimbabwe*

**Keywords.** Susceptibility profile, Vibrio Cholerae, antimicrobial resistance, outbreak.

**Objectives.** To describe the antimicrobial Susceptibility profiles of various antibiotics against Vibrio Cholerae o1 serotype Ogawa in 2018 using SPSS statistical data analysis tools. To describe percentage prevalence of laboratory confirmed V. Cholerae according to age, sex and address using statistical tools.

**Materials and Methods.** A retrospective study was carried out using secondary data from BRIDH laboratories, recorded in their record books during the 2018 Harare Cholera outbreak. The outcome of interest was the antibiotic susceptibility of Vibrio Cholerae o1 serotype Ogawa. Also of interest was the percentage prevalence of Vibrio Cholerae o1 serotype Ogawa according to sex, age and residence in laboratory confirmed cases. International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) version 22.0 was used for statistical data capturing and analysis and Microsoft Excel 2016 was used to plot trends.

**Results.** V. cholerae isolated from males resulted in a percentage of 40 % and females 60%. According to age prevalence was high in (21-40) years age group with 45%, low isolation frequency was recorded at (<60) years with 5%. According to residence prevalence was Budiriro 59%, followed by Glenview with 34% and Mbare 2%. The antimicrobial resistance profile of V. Cholerae o1 Serotype Ogawa in 2018 cholera outbreak was as follows; Amik (0%), Mero (0%), Im (10.2%), Azt(15.4%), Tet(33.8%), Chlo(39.3%), Cip(41.3%), Ery(81%), Amp(88.2%), Cro(91.3%), Caz(93.2%), Cef(93.7%),Ctx (93.2%) and Oxacil(100%) in order of increasing resistance.

**Conclusion.** The multidrug resistant strain of Vibrio Choraе o1 serotype Ogawa experienced during the 2018 Harare Cholera had resistance than ever recorded in Zimbabwe. This entails the need to strengthen the antimicrobial resistance surveillance to continuously monitor the situation and coming up with policies to fight against AMR.

## PREVALENCE OF BACTERIAL VAGINOSIS IN PREGNANT WOMEN AND COMPARISON BETWEEN AMSELS CRITERIA AND NUGENT SCORE FOR ITS DIAGNOSIS

Author: *Nisarga B Kunte*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Rajhans Nagarkar*<sup>1</sup>

<sup>1</sup> *ESIC Medical College Gulbarga, Karnataka, India*

**Keywords.** BV, Nugent score, Amsel's criteria, Clue cells.

**Objectives.** Bacterial Vaginosis (BV) is a shift/disturbance in balance of vaginal microflora, the normal vaginal microflora consisting of Lactobacillus is replaced by over growth of other commensal bacteria. Other characteristic of BV is increase in vaginal pH, increased thin homogenous vaginal discharge with or without burning micturation and itching. It is an extremely common health problem with outcomes like low birth weight infants, PROM, preterm birth, choriomionitis. There are different methods to diagnose BV but microscopy is cost effective and easy. The study focused on prevalence of BV in the study population and compare the diagnostic efficacy of two different microscopic methods - Amsel's criteria and Nugent score. Aims and objectives: A. Prevalence of BV in pregnant women; B. Comparison between sensitivity and specificity of Amsels criteria and Nugent score.

**Materials and Methods.** cross-sectional analysis, Conducted among 100 ANC(antenatal clinic) cases, in the Dept of OBG, Study duration -2 months. Two swabs of vaginal discharge were collected from posterior fornix of vagina. AMSELS CRITERIA : 3 out of 4 criteria suggest BV: i .Thin, homogenous grey/white discharge; ii . Vaginal pH >4.5; iii . Whiff s test: intense, putrid, fishy odour on adding a drop of 10% KOH (Potassium hydroxide) ; iv .Presence of Clue cells ( sloughed off vaginal epithelial cells, coated with cocobacilli at the edges,making the margins look stippled). 2. NUGENT SCORE :10 to 20 oil immersion fields were counted after gram staining the swab and scored based on bacterial morphotyoes.,score, 0 to 3: is normal, 4 to 6: intermediate, 7 to 10: considered BV.

**Results.** 13 cases were reported positive by Amsels criteria and 16 cases were positive according to Nugent score method. According to Nugent score out of 100 cases, 16 were positive, 21 were reported intermediate and 63 were normal. The prevalence of BV in this study is 16%, highest among age group 18-23. The sensitivity of Amsels criteria v/s Nugent score is 15.38% and 23.08% respectively and specificity 88.52% (both methods), of which the Nugent score method is considered to be GOLD STANDARD. The positive predictive values of Amsels v/s Nugent score are 46.15%, 56.25% and negative predictive values are 62.07%, 64.29% respectively. The statistical significance was verified under chi square test with p-value <0.00001.

**Conclusion.** Many times vaginal discharge is unnoticed and under-reported. Many women don't consider it to be a major health issue nor seek treatment in rural India due to lack of facilities. Investigations should be done in both symptomatic as well as asymptomatic women at regular intervals to control vaginal infections.

## STAPHYLOCOCCUS AUREUS AND ESCHERICHIA COLI ANTIMICROBIAL RESISTANCE TENDENCIES AND ANALYSIS

Author: *Anna Marija Prince*<sup>1</sup>

Scientific research supervisors: Prof. *Angelika Krūmiņa*<sup>2,3</sup>, *Laima Ķimse*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Infectiology, Latvia*

<sup>3</sup> *Institute of Food safety, Animal health and Environment "BIOR", Latvia*

**Keywords.** Staphylococcus aureus, Escherichia coli, antimicrobial resistance.

**Objectives.** Antibacterial resistance is an important subject because of its growing tendencies in the recent years. In this study the objective was to analyse two common bacteria samples and determine resistance tendencies.

**Materials and Methods.** Research included 178 bacteria samples taken from random hospitals in Latvia, from those 93 samples were Escherichia coli (E. coli) and 85 were Staphylococcus aureus (S. aureus). Sample resistance was measured and analysed from 2015 to 2018. Antimicrobial susceptibility was performed according to CLSI 2010 (Clinical and Laboratory Standards Institute) guidelines, data collection was performed in Microsoft Excel 2012 and data statistical analysis in IBM SPSS.

**Results.** S. aureus samples demonstrated statistically significantly lower intermediate and total resistance percentage median 7.69% in 2018 comparing to 2015 (18.18%), 2016 (18.18%) and 2017 (8.33%)( $p < 0.005$ ). E. coli samples did not show any significant tendencies through the years, the median year sample intermediate and total resistance was 27.27% in 2015; 27.78% in 2016; 21.43% in 2017 and 17.86% in 2018. In total antimicrobial resistance was determined 1509 times for E. coli and 733 times for S. aureus samples. Significant changes were seen in following antimicrobials: erythromycin, cefoxitin, gentamicin, linezolid in S. aureus group and cephalothin, meropenem, imipenem, nitrofurantoin, norfloxacin, cefazolin, amoxicillin, and amoxicillin/clavulanic acid in E. coli group ( $p < 0.05$ ). There were no significant differences for both bacteria species when comparing the multiple antibiotic resistance (MAR) index numbers ( $p > 0.05$ ).

**Conclusion.** There was a significant decrease in the antibiotic resistance of S. aureus in 2018. There were changes in both bacteria species susceptibility to different antimicrobials. This discovery could be a sign that previous antimicrobial agent usage guidelines have had a positive effect in the year 2018.

## PREVALENCE AND CORRELATIONS OF NAIL BITING IN CLINICAL SAMPLES WITH NAIL DAMAGE IN DERMATOLOGIC PRACTICE

Author: *Monta Beltiņa*<sup>1</sup>

Scientific research supervisor: Dr. *Ilze Upeniece*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Dermatology and Venereology, Latvia*

**Keywords.** Onychophagia, onychotillomania.

**Objectives.** Onychophagia and onychotillomania is rarely seen in clinical practice and is considered undervalued. It is important because these habits can cause severe nail damage and can be associated with psychiatric diseases or could present the patients emotional side.

**Materials and Methods.** Participants were interviewed about onychophagia and onychotillomania habits. Nails and nail folds were evaluated according to the characteristics reported in the literature. The patient's demographic data was also collected. Excel and SPSS 23 were used for data analysis.

**Results.** Both gender participants were included in the study from age of 12 years. Overall, 70 participants were analyzed - 35 were in control group and 35 in nail damage group. In group with nail damage 28,6% participants had shown self-destructive habit (onychophagia 8,6%, onychotillomania 25,7% and both - 5,7%). In control group 22,9% participants had shown self-destructive habit (onychophagia 5,7%, onychotillomania 22,9% and both - 5,7%). There are no statistically significant differences between these groups ( $p=0,785$ ). For 74,3% of patients nail damage was caused by underlying skin disease, more often psoriasis - 61,5% respectively and onychomycosis - 19,23%. The most common nail changes were related to structural damage to the nail plate.

**Conclusion.** The prevalence of onychophagia and onychotillomania does not differ between patients suffering from nail damage and healthy controls. Onychotillomania was more common than onychophagia in the study groups. The most common nail damage cause was underlying skin diseases, mostly - psoriasis. Patients with psoriasis and any of self-destructive habits, presented clinically more severe nail damage. The prevalence of self-destructive nail damage could be population problem and it is not only associated with clinically seen nail damage.



## EFFECT OF DIFFERENT ANTISEPTIC SOLUTIONS ON SKIN MICROBIAL RECOLONIZATION SPEED AND QUALITATIVE CONTENT

Author: *Katrīna Freimane*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Ingus Skadiņš*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Department of Biology and Microbiology, Latvia*

**Keywords.** Chlorhexidine gluconate, povidone-iodine, alcohol, skin antiseptis.

**Objectives.** About 38% of nosocomial infections are of the surgical site (SS) and it develops in 2-5 % of patients undergoing surgery each year. Predominant organisms causing surgical site infections are mainly those of normal skin flora – Streptococci, Staphylococci. This research aimed to analyze the dynamics of the amount of colony-forming units over time after exposure to one of the solutions and study types of microorganisms appearing first after exposure based on their morphological features.

**Materials and Methods.** 72 people aged 18-30 years, divided into four subgroups (G1, G2, G3, G4), participated. Participants received a randomly chosen experiment kit with instructions and one of the solutions – chlorhexidine gluconate (1), ethanol (2), a mix of different alcohols (3), povidone-iodine (4). Solutions 1, 3, 4 were chosen based on indication for preoperative SS skin preparation. Participants were instructed to apply solution and press fingers into the blood agar medium after certain time intervals. Mediums were incubated for 48 hours at 36°C. For evaluation, a colony-forming unit count was performed and Gram staining, and evaluation under a microscope.

**Results.** Data from 63 participants were included (G1=18, G2=16, G3=15, G4=14). Data attained were not statistically significant. Several tendencies could be observed. G2 had a reduction in relative colony count until 90' (0,04) afterward an increase was observed up to 180' (0,10). G1 on average had less than 0,01 relative colony count throughout 15'-180'. Most often white (W, n=244, 38%, AVG 61/G) or yellow (Y, n=216, 34% AVG=54/G) round non-hemolytic colonies could be observed, that microscopically most often were Gr+ Staphylococcus (28%, W=42, Y=27, n=69) or Streptococcus (24%, W=25, Y=27, n=52).

**Conclusion.** Used solutions most often are ineffective against Gr+ Staphylococcus and Streptococcus. The highest efficiency was observed in G1. Small sample size could influence results reliability and statistical significance.

## TRANSEPIDERMAL WATER LOSS ON FOREHEAD DEPENDING ON THE DAILY COSMETIC USE

Author: *Diāna Ramane*<sup>1</sup>

Scientific research supervisor: Assist. Prof. Dr. med. *Žanna Martinsone*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Transepidermal water loss, cosmetic use.

**Objectives.** The aim of this study was to find out whether the daily use of cosmetics affects the transepidermal water loss of skin on forehead.

**Materials and Methods.** Data collection for the study took place from September 21 to September 30, 2020, within the scope of Vertically Integrated Project with the support of KoTuElpo Ltd. Measurements of air temperature, humidity, transepidermal water loss g/cm<sup>2</sup>/sec (TWEL) were obtained during the study. The study involved 84 participants. Each participant was asked to fill in a questionnaire. TEWL was measured using the "Tewameter". The obtained data was analyzed using SPSS 26.0 software. After literature overview on TEWL indicators, following skin type scales were define: 0-10 g/cm<sup>2</sup>/sec indicates oily skin, 10-15 g/cm<sup>2</sup>/sec - moist skin, 15-25 g/cm<sup>2</sup>/sec - mixed skin, above 25 g/cm<sup>2</sup>/sec. dry skin.

**Results.** The study included 59 women and 25 men. Out of these participants, 36 had mixed skin type, 26 normal, 11 dry, 6 sensitive, 3 oily. 69 participants admitted that they use facial skin care cosmetics on a daily basis. 56 women and 13 men used cosmetics. Women used significantly more make-up, skincare, skin cleansing, but men more frequently tilted towards using skin cleansing, skincare products (statistical significance  $p < 0.001$ ). Forehead humidity was moderately moist/normal in 35 women and 16 men ( $p = 0.014$ ). 48 participants using cosmetics had medium / normal skin, 10 wet skin, 8 participants that didn't use cosmetics had medium / normal ( $p = 0.034$ ).

**Conclusion.** Women use cosmetics more often than men, but also half of men, included in this research, did use some type of cosmetics. This research indicates that all participants have moderate / normal skin type regardless of their gender and use of cosmetics. Forehead skin is more moist when using skincare, skin cleansing and decorative cosmetic on daily basis.

# GYNAECOLOGY, GYNAECOLOGICAL SURGERY, OBSTETRICS, PERINATOLOGY

## ANAL HUMAN PAPILLOMAVIRUS INFECTION IN WOMEN WITH HIGH-RISK CERVICAL DYSPLASIA

Authors: *Arta Alksnīte*<sup>1</sup>, *Žanis Bordo*<sup>1</sup>

Scientific research supervisors: Dr. med. *Jana Žodžika*<sup>3</sup>, Dr. *Jana Osīte*<sup>4</sup>,  
Dr. *Nellijs Lietuviets*<sup>3</sup>, *Anastasija Caica-Rinča*<sup>2</sup>, *Marta Priedīte*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Central Laboratory, Department of Molecular and Cell Biology, Latvia*

<sup>3</sup> *Rīga East Clinical University Hospital, Department of Obstetrics and Gynaecology, Latvia*

<sup>4</sup> *Central Laboratory, Latvia*

**Keywords.** Anal HPV, high-risk cervical dysplasia, diagnostics, screening.

**Objectives.** Cervical and anal cancers are the most common human papilloma virus associated malignant diseases in women, however, the association between cervical and anal HPV is not well-established. The aim of the study is to determine the incidence of anal HPV infection and the possible risk factors in women with high-risk cervical dysplasia (HRCd).

**Materials and Methods.** This cross-sectional study is on-going in the Gynaecological department of Rīga East Clinical University Hospital. Currently 14 of 25 planned patients with HRCd and planned cervical excision are involved in the study. Following certain algorithms two separate tissue samples from the rectum and cervix are obtained and the patients are asked to fill out the questionnaire about different risk factors. Encrypted samples are sent to the Central laboratory and analysed using HPV RT-PCR testing method. The high-risk HPV analysis of 14 genotypes is performed. The study is approved by the Ethics Committee of Rīga Stradiņš University. The data is processed using IBM SPSS Statistics 26.

**Results.** Of all patients in this study 100% have positive high-risk HPV in the cervix and 42.8% (6 patients) have high-risk anal HPV. No statistically significant difference was observed between anal HPV-positive and anal HPV-negative groups regarding different risk factors – the mean age was  $42 \pm 4$  and  $36.6 \pm 6.5$  years, the mean age of coitarche –  $16.5 \pm 0.6$  and  $17.1 \pm 1.7$ , the mean count of sexual partners –  $8.8 \pm 6.4$  and  $6.1 \pm 2.5$ , the mean count of cervical HPV types –  $1.7 \pm 1.2$  and  $1.4 \pm 0.5$ , 50% and 37.5% have had anal sex, respectively ( $p > 0.05$ ).

**Conclusions.** In this study almost half of women with HRCd have a high-risk anal HPV infection. However, more extensive studies should be carried out to estimate the risk of anal HPV infection, subsequent premalignant changes of the anal region and the benefit from anal HPV screening in HRCd patients.

## SEXUAL BEHAVIOR OF KAUNAS COUNTY VOCATIONAL STUDENTS

Authors: *Ugnė Kaunietytė*<sup>1</sup>, *Agnė Skvarnavičiūtė*<sup>1</sup>

Scientific research supervisors: Dr. *Joana Celiešiuūtė*<sup>2</sup>, Assoc. Prof. Dr. *Kristina Jarienė*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup>*Lithuanian University of Health Sciences, Department of Obstetrics and Gynecology, Lithuania*

**Keywords.** Vocational school, sex education, sexual behavior, contraception, knowledge.

**Objectives.** The experience of sex life is gained at an increasingly younger age, while the growing number of sexually active adolescents demonstrates the relevance of this problem. Although sex education is introduced in schools, too little attention is paid to vocational school students with lower general education. The aim of our study was to evaluate the sexual behavior of Kaunas County vocational school students.

**Materials and Methods.** The study was based on validated original questionnaires and comprised students of 10 vocational schools. The analysis of 650 questionnaires was performed.

**Results.** The mean age of the respondents was  $20,3 \pm 4,5$  years. Sexual intercourse was reported by 60.9% of students (66.2% females and 49.5% males). The average age of first sexual intercourse was  $17,0 \pm 1,6$ . Of those who had sexual intercourse, the median of sexual partners in females was 2 partners [1 - 4] and in males 3 [2 - 4],  $p=0,004$ . Females more frequently had one sexual partner (40.0% vs 21.6%  $p=0,001$ ). Those who had their first sexual intercourse before the age of 17 were more often unaware of HPV (42.5%  $p=0,018$ ) and didn't know what HPV was (43.6%  $p<0,001$ ). Unplanned first intercourse was more common among males (58.0%) than females (36.7%),  $p<0,001$ . 59.7% of respondents used contraception during their first intercourse and 61.2% during their next ones. The most popular contraception method in both groups were condoms (66.4% and 61.9%). The internet as the main source of information was pointed out by 70,8% of students. Males more often than females reported neither receiving nor searching for any information (7,9% vs 12.0%,  $p<0,001$ ).

**Conclusions.** More than half of the respondents were sexually active, 6 out of 10 used contraception, mostly condoms. The main information source about sexual behaviour was the internet.

## AWARENESS OF VACCINATION AGAINST HUMAN PAPILLOMAVIRUS AMONG ADOLESCENTS

Authors: *Anna Linda Upmale*<sup>1</sup>, *Anete Vanaga*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Jana Žodžika*<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynecology, Latvia*

<sup>3</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Human papillomavirus, knowledge, adolescents, vaccination.

**Objectives.** Human papillomavirus (HPV) immunization in Latvia started in 2010. Since then, the average coverage is still under 60%. Lack of knowledge can seriously threaten the vaccination coverage, which affects the spread of HPV-related diseases. This is the reason why it is important to understand how informed adolescents feel about HPV. The aim of this study was to evaluate awareness of vaccination against HPV among adolescents.

**Materials and Methods.** A cross-sectional survey was carried out. Structured questionnaires were used to collect data. A total of 1266 questionnaires were analyzed. Vaccinated and non-vaccinated 8th grade students in Rīga were compared. The research was approved by the RSU Ethics Committee. The data was analyzed using IBM SPSS 26.

**Results.** The study included 1266 adolescents 58.1% (n=735) girls, 41.9% (n=531) boys. Mean age was 14 (SD=1). 16.1% (n=204) were vaccinated against HPV – 98.5% (n=201) girls, 1.5% (n=3) boys, 28% (n=354) were not, 55.9% (n=708) did not know their status. Mean age when vaccination started - 12.9 (SD=1). 59.5% (n=632) of those non-vaccinated would like to be vaccinated. The most common reason not to vaccinate was not knowing about the HPV vaccine 47.7% (n=630). Using a scale from 1 to 5 correspondingly to how informed they felt about HPV vaccine benefits and possible risks, the analysis indicated the mean 2 for non-vaccinated adolescents and 2.7 for vaccinated adolescents. Most common reasons for vaccinating: 48.8% (n=630) believed that vaccines reduce risk of disease in society, 46.7% (n=591) assumed that it reduces the chance of getting disease. Only 6.6% (n=83) knew that HPV may cause cervical cancer.

**Conclusions.** To conclude, the study implies that the main reason for not vaccination is lack of knowledge about HPV and the vaccine's benefits for health. It is necessary to educate adolescents about HPV to increase immunization coverage.

## PARENTAL REASONS FOR ACCEPTANCE OR REFUSAL OF HUMAN PAPILLOMAVIRUS VACCINE

Authors: *Anete Vanaga*<sup>1</sup>, *Anna Linda Upmale*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Jana Žodžika*<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynecology, Latvia*

<sup>3</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Human papillomavirus, vaccination, parents.

**Objectives.** Immunization against human papillomavirus (HPV) in Latvia started in 2010. In 2019, HPV vaccination coverage was 56,5 %. Parents are typically involved in the clinical decision-making process of vaccine administration to their children. Therefore, understanding the acceptability of the HPV vaccination as a method to prevent certain HPV related diseases is critical. The aim of this study was to assess parents' attitudes towards receiving the vaccine for their children.

**Materials and Methods.** A cross-sectional survey including 310 parents was carried out, non-vaccinated and vaccinated 12-17 year old child's parents were compared. A structured questionnaire was used to collect data. The research was approved by the RSU Ethics Committee. The data was analyzed using IBM SPSS 26.

**Results.** 310 parents were included in this study (96.8% mothers, 3.2% fathers). 36.8% (n=114) children were vaccinated against HPV, 63.2% (n=196) were not. Mean age starting vaccination was 13 (SD=1). 18% (n=68) parents did not vaccinate their children because they thought the vaccine has many side effects, 16% (n=60) believed that the vaccine needs more research, and it is not effective. 34.2% (n=50) parents vaccinated their children because they were informed about vaccine importance, 31.5% (n=46) followed up their immunization schedules, in 27.4% (n=40), general practitioners had recommended vaccination. The main information source of HPV in 26.3% (n=170) was the internet, in 25.1% (n=162) – the child's general practitioner. The parents of vaccinated children were statistically significantly more likely to have the child's general practitioner as a source of information ( $p < 0.001$ ).

**Conclusions.** The most common reasons not to vaccinate are parents' misconceptions about the vaccine. It is necessary to promote parental education to achieve a better vaccination coverage. The results show the necessity of the GPs recommendation for receiving HPV vaccination.

## AWARENESS AND ATTITUDE REGARDING PREVENTION AND CONTROL OF COVID-19 INFECTION AMONG PREGNANT WOMEN

Authors: *Darja Mihailova*<sup>1</sup>, *Ieva Pitkēviča*<sup>1</sup>, *Marta Laura Graviņa*<sup>1</sup>

Scientific research supervisors: Prof. *Dace Rezeberga*<sup>2</sup>, Prof. *Gunta Lazdāne*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

<sup>3</sup> *Rīga Stradiņš University, Institute of Public Health, Latvia*

**Keywords.** Pregnancy, information, attitude, COVID-19.

**Objectives.** Recent evidence suggests that pregnant women are not at increased risk of becoming COVID-19 infected or having a more severe course of the disease than the general population. From March to June 2020, COVID-19 restrictions were implemented in Latvia. The aim of the study is to understand attitudes and awareness of pregnant women regarding COVID-19 infection in Latvia.

**Materials and Methods.** Online survey and qualitative research were conducted from July to October 2020 as a part of a multi-country study I-SHARE (International Sexual Health And Reproductive Health survey in the time of COVID-19) and the state research project "Impact of COVID-19 on health care system and public health in Latvia; ways in preparing health sector for future epidemics" (VPP-COVID-2020/1-0011). Data were summarized and analyzed using MS Excel and IBM SPSS 26.0.

**Results.** 899 Latvian reproductive age women participated in the online survey, 70 of responders were pregnant during the COVID-19 pandemics. 34.3% of the pregnant women stated they did not receive sufficient information about COVID-19. 22.9% received information from a doctor-midwife and 28.6% from the media. More than one fourth (27.6%) canceled or postponed their antenatal visits, 60% due to the fear of acquiring COVID-19 in the health care facility. Only 1.4% (1 of 70) planned to give birth at home because of the fear of being infected with COVID-19 in the hospital. From responders who gave birth (63 women) 3.2% gave birth at home, one of them preferred delivery at home because of concerns regarding the risks of COVID-19 in the health facility.

**Conclusions.** Pregnant women are afraid of COVID-19 infection because of their low level of information directly related to pregnancy. This may influence the quality of antenatal care and decisions regarding the place of delivery. It is important to use telemedicine for appropriate counselling of COVID-19 risks.

## A VALUE OF NEUTROPHIL-LYMPHOCYTE RATIO TO PREDICT CHORIOAMNIONITIS

Author: **Greta Kvederaite-Budre**<sup>1</sup>

Scientific research supervisor: Dr. **Greta Balciuniene**<sup>2,3</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Institute of Clinical Medicine of the Faculty of Medicine of Vilnius University, Clinic of Obstetrics and Gynaecology, Lithuania*

<sup>3</sup> *Vilnius University Hospital Santaros Klinikos, Center of Obstetrics and Gynaecology, Lithuania*

**Keywords.** Chorioamnionitis, leukocytosis, neutrophil-lymphocyte ratio, prepartum diagnosis.

**Objectives.** Chorioamnionitis may be a life-threatening condition to both the new-born and the mother. The labour should be initiated once the diagnosis of chorioamnionitis is established. As the prepartum diagnosis of chorioamnionitis remains challenging, the efforts are made in search of more specific diagnostic criteria. The neutrophil-lymphocyte ratio (NLR) is an inflammatory marker that can be used as an indicator of many inflammatory disorders. The aim of the study was to evaluate the NLR as a predictor of chorioamnionitis in mothers with preterm delivery and to compare prognostic values of NLR with C-reactive protein and the leukocyte count in chorioamnionitis.

**Materials and Methods.** A retrospective study was conducted at Vilnius University Hospital Santaros Klinikos. 137 women with signs of preterm delivery before 34 weeks of gestation were included. All women were managed with single course of antenatal corticosteroids. Blood samples were taken no earlier than 72 hours after the steroid administration and 24-48 hours before delivery. Following the delivery, the diagnosis of chorioamnionitis was confirmed by histological examination of the placenta, and mothers were divided into two groups: with (Group I) and without chorioamnionitis (Group II). Data analysis was performed using R version 4.0.3 (R Core Team, 2020).

**Results.** Mean NLR was significantly higher in Group I than in Group II ( $p$ -value < 0.001). The area under the curve (AUC) of NLR was higher than AUC of leukocyte count (0.89 and 0.81, respectively). No difference was found in the receiver operating characteristic (ROC) curves of NLR and CRP. The NLR predicted chorioamnionitis at the optimal cut-off value of 5.97, with 77% sensitivity, 95% specificity, positive and negative prognostic values of 0.91 and 0.87, respectively.

**Conclusions.** NLR is a better prognostic marker for chorioamnionitis than leukocyte count in women with preterm delivery before 34 weeks of gestation.



## COMPARISON OF KNOWLEDGE ABOUT CONTRACEPTION BETWEEN WOMEN LIVING WITH HIV AND HIV-NEGATIVE WOMEN

Author: *Ieva Pitkēviča*<sup>1</sup>

Scientific research supervisors: Dr. *Violeta Bule*<sup>1,2</sup>, Prof. *Gunta Lazdāne*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

<sup>3</sup> *Rīga Stradiņš University, Institute of Public Health, Latvia*

**Keywords.** HIV, contraception, knowledge.

**Objectives.** The number of newly detected HIV cases among women in Latvia has been the highest not only between Baltics but also in the European Union. All women have the same rights concerning their reproductive health and sexuality, thereby they should receive equal knowledge about effective contraception. The study aims to compare knowledge about contraception between women living with HIV (WLHIV) and HIV-negative women.

**Materials and Methods.** The study was conducted in cooperation with the European Society of Contraception and Reproductive Health. A cross-sectional survey of WLHIV aged 18-49 took place in nongovernmental organizations (AGIHAS, DIA+LOGS) from March 2019 until October 2020. An online survey was used to reach HIV-negative women. Data were analysed using IBM SPSS.

**Results.** 225 HIV-negative women (median age 29, IQR 25-33) and 99 WLHIV (median age 32, IQR 28-38) participated in the study. 65.3% HIV-negative, 26.8% WLHIV agreed that use of contraceptive pills dispels fear of unwanted pregnancy,  $p < 0.001$ . 65.3% HIV-negative, 39.1% WLHIV agreed that use of contraception creates positive emotions during sexual intercourse,  $p < 0.001$ . 35% WLHIV, 19.1% HIV-negative women thought that emergency contraception is comparable to abortion,  $p < 0.001$ . Around 50% of all women could not evaluate contraception effects on HIV infection and if the usage of hormonal contraception is associated with increased oncological risk. 46.4% WLHIV, 15.6% HIV-negative women were not aware of the effect of pills on the menstrual cycle,  $p < 0.001$ . HIV-negative women were better informed about hormonal methods, emergency contraception ( $p < 0.001$ ), WLHIV were better informed about non-hormonal IUD ( $p < 0.009$ ). The most common source of information about contraception for both groups was a gynaecologist (HIV-negative 84.9%, WLHIV 59.6%,  $p < 0.001$ ).

**Conclusions.** HIV-negative women showed more knowledge about effective contraception comparing with WLHIV. To achieve reproductive and sexual health goals for all including WLHIV, targeted information and family planning services for WLHIV should be available and accessible.

## NON-CLASSIC CONGENITAL ADRENAL HYPERPLASIA CAUSING ALLELES AMONG ADOLESCENT GIRLS WITH PCOS – GENETICAL STUDY

Author: *Laine Bekere*<sup>1</sup>

Scientific research supervisors: Dr. *Lāsma Līdaka*<sup>2</sup>, Prof. *Gunta Lazdāne*<sup>3</sup>,  
Asoc. Prof. *Iveta Dzīvīte-Krišāne*<sup>2</sup>, Dr. med. *Linda Gailīte*<sup>4</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

<sup>3</sup> *Rīga Stradiņš University, Institute of Public Health, Latvia*

<sup>4</sup> *Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia*

**Keywords.** PCOS, NCAH, CYP21A2.

**Objectives.** Polycystic ovary syndrome (PCOS) is the most common endocrinopathy affecting women in reproductive age. Clinical signs usually appear during adolescent years. Irregular menstrual cycles with clinical and/or biochemical hyperandrogenism are the diagnostic criteria for PCOS in adolescents according to ESHRE 2018 guidelines. The differential diagnosis is broad, however non-classic congenital adrenal hyperplasia (NCAH), caused by pathogenic variants in *CYP21A2* (6p21.3) gene, ranks first. *CYP21A2* pathogenic variants in heterozygote state are thought to be involved in pathogenesis of PCOS phenotype. The aim of the study was to determine the prevalence of NCAH causing variants among adolescent patients with PCOS.

**Materials and Methods.** The study included 55 adolescents with PCOS according to ESHRE 2018 diagnostic criteria. The control group consisted of 49 age matched healthy adolescents. Molecular analysis of the *CYP21A2* gene was performed by using Multiplex Ligation-dependent Probe Amplification Test (Probemix Po50-C1, MRC-Holland), detecting number of copies for *CYP21A2*, *CYP21AP*, and seven single nucleotide variants. Research was approved by Central Medical Ethics Committee of Latvia.

**Results.** Age ranged 12-18 years (Me=16.0; IQR=2.0) and there were no statistically significant differences between groups. Median score in Ferriman-Gallway scale was 9.0(IQR=6.0) in PCOS and 2.0(IQR=2.0) in control group ( $p<0.01$ ). Pathogenic variant of *CYP21A2* intron 2 splice-site I2G(rs6467) was detected in two(3.6%) PCOS patients and three(6.1%) controls. Prevalence difference not statistically significant( $p=0.63$ ). Also one patient with I172N(rs6475) in case group and two controls with c.-113A>G were identified. In none of the cases NCAH were confirmed.

**Conclusions.** Tested *CYP21A2* pathogenic variants were equally prevalent between case and control group - no NCAH cases masked as PCOS among study sample. Variations that can be detected via aforementioned test kit did not play a role in PCOS phenotype in our study. Further studies in this area are required in order to cover larger study sample and test less prevalent mutations.

## REVEAL OF GENDER-BASED VIOLENCE RELATED CLINICAL CHARACTERISTICS AND WARNING SIGNS AMONG LATVIAN WOMEN

Author: *Anna Pentjugova*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Anna Miskova*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Maternity Hospital, Latvia*

**Keywords.** Violence, gynaecological problems.

**Objectives.** Gender-based violence is a hidden epidemic. It violates the women rights, damages their health and well-being. The aim was to evaluate the main gynaecological problems, somatic symptoms and factors, that women are prone to experience after facing any type of gender-based violence and use this data for future violence-revealing questionnaire in health care practice.

**Materials and Methods.** Descriptive cross-sectional study using questionnaires was carried out from November 2020 to January 2021. Overall, 507 women were interviewed. Data was analyzed using Microsoft Excel and SPSS26.

**Results.** 315(62,1%) of women experienced gender-based violence. The mean age - 28(SD±7,2; range 18-67). Partially or fully financially dependent women (n=109;34,6%) in 72(66,0%) cases experienced chest pain. 123(80,4%) women, abused by smokers, frequently had headache and 29(18,9%) of the similar group resorted to abortions. 110(62,5%) victims of those abusers, who consumed alcohol, noted dysmenorrhea. 33(55,0%) victims of drug-addicted abusers experienced combination of all violence types and 28(46,6%) tried drugs as well, 27(8,6%) remained in relationships with drug-addicts. Sexual abuse was mentioned by 217(68,9%). 66(41,0%) of them don't use contraception in their current sexual relations, frequently facing STI (n=40;18,4%). Moreover, 33(54,1%) victims of forced unprotected sex, who are sexually active now (n=61;28,1%), also don't use contraception, 74(97,3%) out of sexually active and inactive altogether (n=76;75,0%) mentioned back pain. Sexual abuse victims noted difficulties in further sexual relations - 46(21,2%) had arousal issues, the same indicator was revealed for decreasing libido. 15(71,4%) women, who had perineal bleeding after sexual abuse, reported dysmenorrhea, pelvic pain: constant (n=2;9,5%) or rare (n=12;57,1%) and depression (n=18;85,7%). 217(68,9%) women reported physical abuse, 133(61,3%) of whom mentioned depression, 94(58,4%) dyspareunia and 113(52,1%) difficulties in sexual life after violence.

**Conclusions.** The study demonstrates that gender-based violence victims have statistically significant gynaecological problems including dysmenorrhea, STI, pelvic pain, sex life problems and somatic complaints, assessment of which can be useful for healthcare practitioners.

## SYMPTOMS OF ANXIETY IN PERINATAL PERIOD IN LATVIAN WOMEN

Authors: **Laine Laugale-Veilande**<sup>1</sup>, **Kristine Klaramunta - Antila**<sup>1</sup>, **Vinita Cauce**<sup>1</sup>

Scientific research supervisors: Asoc. Prof. **Laila Meija**<sup>3</sup>, Dr. **Liva Ušpele**<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga Maternity Hospital, Latvia*

<sup>3</sup>*Liepāja Regional Hospital, Latvia*

**Keywords.** Anxiety screening, perinatal period.

**Objectives.** Perinatal anxiety disorders are highly prevalent in pregnancy and have negative impact on maternal and child outcomes. Evaluating anxiety symptoms in Latvian women in their perinatal period with Generalized Anxiety Disorder – 2 (GAD-2) screening tool.

**Materials and Methods.** The study has been implemented within the framework of the Latvian Council of Science project No. Izp-2019/1-0335. It is a cross-sectional study of Latvian pregnant women and women until 7th day post-partum, who consented to participating in a personal interview survey. In 2020, 287 women were interviewed. Data were analysed by IBM SPSS program.

**Results.** In total, 287 women answered the PHO-2 screening test, 15% of those had scored three or more points, thus indicating for possible anxiety disorder, and would require further assessment. Only 15 % of these women said their symptoms did not affect their daily functions and interaction with other people. In women who screened positive, the mean age was 32,6 (SD 4,6); the median income per household was EUR 2500 (IQR 1500 to 3000); nationality: Latvian - 77 %, Russian - 19%, other - 5%; marital status: married - 77%, partnership - 23 %; mode of delivery: vaginal birth - 63%, instrumental vaginal delivery - 2%, and Caesarean section - 30%; gestation week (GW) at time of delivery: <37 GW - 5%, 37-40 GW - 74%, and >41 GW - 16%. No statistically significant correlation with age, income, marital status, and time and mode of delivery was found.

**Conclusions.** The prevalence of anxiety disorder symptoms in perinatal period is noteworthy, 85% of respondents claimed the symptoms interfere with their daily functioning. The limitation of study is the small sample of respondents with depressive disorder symptoms.

## METHODS AND INDICATIONS FOR LATE PREGNANCY TERMINATION AND FETICIDE IN EUROPEAN COUNTRIES

Author: *Ieva Pitkēviča*<sup>1</sup>

Scientific research supervisors: Dr. *Elizabete Pumpure*<sup>2</sup>, Prof. *Dace Rezeberga*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

**Keywords.** Late pregnancy termination, feticide.

**Objectives.** Where the fetal abnormality is not lethal and termination of pregnancy is attempted after 22 weeks of gestation, absence of feticide could result in a live birth, an outcome that contradicts the intention of the abortion. The study aims to understand action for late termination of pregnancy and methods, indications for feticide among European countries.

**Materials and Methods.** A cross-sectional survey with multiple-choice questions and open answers in English was sent to gynaecologists in Europe. The study was conducted from January 2020 until January 2021. Data were analyzed using Microsoft Excel.

**Results.** Answers were received from 16 countries: Austria, Czech Republic, Denmark, Estonia, France, Greece, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Switzerland, Turkey, United Kingdom. In all, pregnancy termination was defined by law. First-trimester screening (11-13+6 weeks), second-trimester screening (20-22+6 weeks) was performed in 14 countries. Pregnancy termination for medical indications can be performed in all countries- in 6 countries without a definite period. In 7 countries abortion due to medical indications was not allowed if fetal weight  $\geq 500$  grams and/or  $\geq 24$  weeks. In 11 countries late pregnancy termination was performed using misoprostol or surgically. Feticide was performed in 13 countries (except Norway, Lithuania, Poland) mainly by a gynaecologist. Indications for feticide: pregnancy termination after 21+6 weeks, psychosocial reasons, women's request. Reasons for feticide: to facilitate and induct termination, ethical, psychoemotional. Most used method for feticide was transabdominal intracardiac administration of potassium chloride. Reasons why the feticide was not performed: legal, ethical, religious, non-acceptance by society. Consent "not to resuscitate" can be signed in 5 countries.

**Conclusions.** Late termination of pregnancy and feticide is associated with ethical, legal and psychoemotional barriers. It is essential to establish a direct methodology for gynaecologists and ensure that every woman in Europe has equal rights and possibilities to receive generally accepted procedures and manipulations.

## THE ROLE OF BIOFILM FORMATION AND ANTIBIOTIC RESISTANCE OF GROUP B STREPTOCOCCI DURING PREGNANCY

Author: *Ulrika Ulla Andersone*<sup>1</sup>

Scientific research supervisors: Dr. *Laura Rācene*<sup>2,5</sup>, Dr. *Kārlis Rāčenis*<sup>3,4</sup>,  
Dr. *Dace Rezevska*<sup>4</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

<sup>3</sup> *Pauls Stradiņš Clinical University Hospital, Center of Nephrology, Latvia*

<sup>4</sup> *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

<sup>5</sup> *Rīga Maternity Hospital, Latvia*

**Keywords.** Group B Streptococcus, biofilm formation, antibiotic susceptibility.

**Objectives.** *Streptococcus agalactiae* is a member of group B streptococci (GBS). In 5-30% healthy women in reproductive age it is a part of normal vaginal and lower gastrointestinal tract microbiota. *S. agalactiae* is an important risk factor for neonatal sepsis in the first week of life. Biofilm formation and antibiotic resistance has a great role in *S. agalactiae* colonization and infection. Effect of antibacterial agents on biofilm structures is insufficient due to reduced bacterial metabolic activity and lowered penetration.

**Materials and Methods.** Pure cultures of *S. agalactiae* were obtained from Pauls Stradiņš Clinical University Hospital, Rīga East Clinical University Hospital and NMS laboratory. To assess antibacterial susceptibility, disk diffusion test was applied according to EUCAST version 11.0, 2021. Biofilm cultivation in sterile 96-well plates over 24 hours was performed according to *Stepanovic et al* protocol. Optical density measurements were done after biofilm staining. The cut-off value (ODc) was separately established as three standard deviations (SDs) over the mean negative control value for each plate. Experiments were conducted in triplicate. Statistical analysis was performed using MS Excel 16.44, 2020.

**Results.** In total, 21 GBS strains were analysed. Six strains were biofilm producers, four strains - weak producers, two strains - moderate, whereas 15 strains were biofilm non producers. Three strains were resistant to benzylpenicillin, three - to clindamycin and erythromycin, U006 - to benzylpenicillin and erythromycin. U012 strain was moderate biofilm producer and resistant to benzylpenicillin, U025 was moderate biofilm producer and resistant to clindamycin and erythromycin.

**Conclusions.** Biofilm formation and antibacterial resistance was detected in isolated *S. agalactiae* strains. Therefore, such factors should be accounted in selection of proper antimicrobial regimen. Data obtained indicates that antibacterial susceptibility should be considered after confirmed GBS colonization. Biofilm formation should be investigated in prolonged incubation period to detect impact of GBS colonization.

## EXPERIENCE OF LATVIAN HEALTH-CARE WORKERS IN REVEALING AND EVALUATION OF GENDER-BASED VIOLENCE AMONG WOMEN

Author: *Anna Pentjugova*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Anna Miskova*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Maternity Hospital, Latvia*

**Keywords.** Violence against women.

**Objectives.** Health professionals are to maintain an opportunity to create safe conditions for abused women by disclosing violence and offering medical support. Unfortunately, the range of these issues is still not sufficiently researched and implemented in healthcare practice. The study was aimed to assess the experience of gender-based violence examination by doctors, as well as initiate the process of developing practical guidelines for Latvian health workers.

**Materials and Methods.** Descriptive cross-sectional study using questionnaires was conducted from November 2020 to January 2021. Overall 103 of healthcare professionals were analysed. IBM SPSS software was used for data processing.

**Results.** 23(21.9%) respondents work as certified specialists >20 years. 28(26.7%) respondents admitted that they are not familiar with specific signs of violence and 18(17.1%) don't feel confident about identifying them. 20(19.0%) of doctors always purposefully look for signs of violence in patients with specific complaints and 56(53.3%) always pay attention and ask questions about signs of injury. For the rest the main reason for ignoring signs of violence is concentration on the problem addressed by the patient (n=32;30.5%). 70(66.7%) doctors worked with victims of violence, most often Obstetrician-Gynecologists (n=26) and General Practitioners (n=28), (p<0.01). 62(59.0%) patients were adults, 18(17.1%) were minors, 23(21.9%) were pregnant and 10(9.5%) in menopause. 47(56.2%) encouraged patients to turn to psychologist or psychotherapist, 59(56.2%) encouraged them to contact the police. 14(20.0%) of Obstetricians-Gynecologists and 9(12.9%) General Practitioners noted that none of these patients had repeatedly come for a visit (p=0.046). 87(82.9%) doctors don't fill any protocols devoted to violence during the patients' first visit. 73(69.5%) doctors would like to use a standardized violence-screening questionnaire in their daily work.

**Conclusions.** Most of the doctors have come across violence victims in their practice. However, some of the doctors do not feel safe enough in identifying specific signs of violence and would like to use a standardized violence screening questionnaire in their daily work.

## PLACENTAL HISTOLOGICAL DIFFERENCES IN PATIENTS WITH SEVERE OR MILD PREECLAMPSIA IN CASE OF CESAREAN SECTION

Authors: *Loreta Miluna*<sup>1</sup>, *Beatrise Elizabete Gustsone*<sup>1</sup>

Scientific research supervisor: Dr. med. *Ivanda Franckeviča*<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Pathology, Latvia*

<sup>3</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Pregnancy, Cesarean section, placenta, mild, severe preeclampsia, fetal retardation.

**Objectives.** To determine the differences of histopathology and measurements in placental samples by women who delivered babies in 3<sup>rd</sup> trimester and had mild preeclampsia (PE levis) or severe preeclampsia (PE gravis).

**Materials and Methods.** This retrospective study included placental samples from 30 women with a singleton gestation who delivered at 3<sup>rd</sup> trimester with Cesarean section and had preeclampsia during pregnancy. Placental samples were divided in two groups-patients who had severe or mild preeclampsia. Analysis was made using available data from the archives of the pathology office in Children's Clinical University Hospital in Latvia. For statistical analysis was used IBM SPSS 26 version.

**Results.** 63,3% (n=19) patients had mild preeclampsia, 36,7% (n=11) had severe preeclampsia. 89% (n=17) of mild preeclampsia (PE) patients and 36,4 % (n=4) of severe PE patients had fetal retardation. There is statistically significant association between mild PE and fetal retardation, Pearson Chi-Square test,  $X^2=8.895$ ,  $p=0.003$ . There is no statistically significant association between severe PE and fetal retardation, Pearson Chi-Square test,  $X^2=0.091$ ,  $p=0.763$ . Syncytial knot index was above average in 68,4% (n=13) patients with mild PE and 63,3% (n=7) with severe PE. 26,3% (n=5) of mild PE and 18,18% (n=2) of severe PE patients had multiple hemorrhage. Decreased placental weight had 68,4% (n=13) of mild PE patients and none of severe PE.

**Conclusions.** In both groups, there are signs of maternal vascular malperfusion such as elevated syncytial trophoblast knot index and hemorrhage, which corresponds to literature data. Patients with mild preeclampsia have a statistically significant higher incidence of fetal retardation and also reduced placental weight, which is indeed a sign of severe circulatory disorders.



## CAUSES OF ANTENATAL FETAL DEATH IN LATVIA (2014–2019)

Author: *Liliāna Ilgača*<sup>1</sup>

Scientific research supervisor: Dr. med. *Ivanda Franckeviča*<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Pathology, Latvia*

<sup>3</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Antenatal fetal death, stillbirth, perinatal care, obstetrics, intrauterine fetal death.

**Objectives.** The aim of this study was to find out the causes of antenatal fetal death in Latvia from 2014 to 2019 and compare the obtained results with the results of the research on the past period (*Antenatal death in Latvia (2003-2013), I.Franckeviča, V.Madesova, G.Ķiršakmens,2015*).

**Materials and Methods.** The retrospective study included 841 cases of perinatal fetal death in the period from 2014 to 2019 year. The data gained from autopsy protocol contains information about the results of macroscopic and histological examination of the fetus and placenta, cause of fetal death, gender of fetus, gestational age, maternal age, mother's illnesses, number of pregnancies and childbirths. Descriptive statistics was made by Microsoft Excel.

**Results.** 526 fetuses died antenatally from 2014 to 2019, or 62,54% of the total number of perinatally deaths. In 20,34%(n=107) of cases the cause of death was pathology of the placenta, 19,01%(n=100) fetal abnormalities, 9,51%(n=50) ischemic injury, 9,32%(n=49) umbilical pathology, 4,75%(n=25) maternal disease, 3,80%(n=20) combined pathology, 3,04%(n=16) nonspecific inflammation, 0,57%(n=3) specific perinatal period infection and 0,57%(n=3) fetofetal transfusion syndrome. Unidentified death cause (antenatal fetal asphyxia) was listed in the 29,09%(n=153) cases in postmortem diagnosis. Among the antenatal deaths 29,66%(n=156) were born from 22<sup>nd</sup> to 27<sup>th</sup> gestational week, 21,10%(n=111) from 28<sup>th</sup> to 33<sup>rd</sup> week, 48,67%(n=256) from 34<sup>th</sup> to 41<sup>st</sup> week and 0,57%(n=3) in 42<sup>nd</sup> week or later. 54,56%(n=287) of the antenatally dead fetuses were male.

**Conclusions.** In comparison with the time period from 2008 to 2013 (55,04% of the total number of perinatally deaths) cases of antenatal deaths over the past six years have increased by 7,46% and unidentified postmortem diagnosis (46,83% in the period from 2008 to 2013) was incidence decreased by 17,74%, possibly due to improvement in the quality of pathologists work. Most common identified cause of death was associated with the placental pathology.

## KNOWLEDGE ABOUT TORCH INFECTIONS IN PREGNANT WOMEN IN LATVIA

Author: *Linda Šapele*<sup>1</sup>

Scientific research supervisor: Dr. *Olga Plisko*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynecology, Latvia*

**Keywords.** TORCH infections, toxoplasmosis, rubella, herpes simplex.

**Objectives.** Perinatal infections make up to 2 – 3% of all congenital infections. Toxoplasmosis, syphilis, varicella zoster virus infection, parvovirus B19, rubella, cytomegalovirus and human herpes virus are among the most common inherited infectious diseases. Most TORCH infections cause mild illness for the mother, but serious complications for the fetus, and treatment of the maternal infection does not affect the outcome in the fetus, so prophylaxis is of great importance. The aim of the study was to analyze knowledge about TORCH infections in pregnant women.

**Materials and Methods.** The study was performed in November 2019 – December 2020 and included 100 pregnant women aged 16 to 46 who were asked to complete an anonymous questionnaire about the incidence, complications and prevention of TORCH infections.

**Results.** Of the 100 participants, 6 fully explained the meaning of the abbreviation TORCH, 19 partially and 75 did not know the meaning. 12 women answered correctly which TORCH infections can be avoided by vaccination. 72 study participants have been vaccinated against rubella. 16 women answered correctly that the most common congenital rubella manifestation is sensorineural hearing loss. 75 out of 100 pregnant women correctly answered that the carrier of *T. gondii* is a cat. Regarding the prevention of toxoplasmosis, the two most common responses were hand hygiene (n – 32) and not cleaning the cat's litter box (n – 24), 4 women considered that vaccination can prevent toxoplasmosis, but 23 did not know the answer. Of the 43 participants who have a cat at home, 30 answered the question about toxoplasmosis prevention correctly. 6 respondents did not know the correct answers to any of the questions.

**Conclusions.** Knowledge about TORCH infections in pregnant women in Latvia is insufficient. It is necessary to educate women about the possibilities of primary and secondary prophylaxis, and to inform about the possible consequences of TORCH infections.

## THE IMPACT OF COVID-19 OUTBREAK ON INFERTILITY SERVICES IN VUH SANTAROS CLINICS

Author: *Adele Gudleviciute*<sup>1</sup>

Scientific research supervisors: Prof. *Diana Ramasauskaitė*<sup>2</sup>, Dr. *Zivile Gudleviciene*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Vilnius University Hospital Santaros Clinics, Clinic of Obstetrics and Gynaecology, Lithuania*

**Keywords.** Assisted reproduction services, COVID-19, Survey.

**Objectives.** The COVID-19 outbreak was declared as a pandemic by the World Health Organization on March 11, 2020. It has strained healthcare systems throughout the world. Assisted reproduction was no exception, reproductive health professionals are also fighting against this pandemic. The aim of this study was to evaluate the effect of COVID-19 on healthcare services and psychological well-being of healthcare workers and to compare the results between two groups of respondents: one group that works in the Fertility Center of VUHSC (1<sup>st</sup> group) and another group that works in other healthcare facilities in Lithuania (2<sup>nd</sup> group).

**Materials and Methods.** A web-based 33-item questionnaire was delivered to 1<sup>st</sup> group participants by email and to 2<sup>nd</sup> group participants by Facebook via group "Medics of Lithuania".

**Results.** 12 participants from 1<sup>st</sup> group and 268 participants from 2<sup>nd</sup> group responded to this survey. 86.5% of the respondents from 2<sup>nd</sup> group and none of the respondents from 1<sup>st</sup> group reported that their hospital staff members had been diagnosed with COVID-19 infection, part of respondents (42.2% and 25.0% accordingly) did not go to work for some period of time by their own choice or because of mandatory self-isolation, a great number of respondents (61.6% and 33.3%) reported personnel shortage. 66.7% of participants from 1<sup>st</sup> group and 33.2% of participants from 2<sup>nd</sup> group did not receive training in infection control, part of respondents (16.7% and 19.3% accordingly) felt that they were not given adequate personal protective equipment and many participants (41.7% and 60.8%) expressed worry about their health while being at work. Many respondents (58.3% from 1<sup>st</sup> group and 82.1% from 2<sup>nd</sup> group) reported negative impact of pandemic on their mental health.

**Conclusions.** COVID-19 had a huge impact on healthcare and healthcare providers. Many respondents reported its' negative effects on health services and both physical and mental health.

## CERVICAL ASSESSMENT BY TRANSVAGINAL ULTRASOUND AT FIRST AND SECOND TRIMESTER IN PATIENTS AFTER PREVIOUS CAESAREAN DELIVERY

Author: *Agnė Plūmė*<sup>1</sup>

Scientific research supervisor: Dr. *Eglė Savukynė*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Lithuanian University of Health Sciences, Department of Obstetrics and Gynaecology, Lithuania*

**Keywords.** Cervical length, Preterm birth, Cervical incompetence.

**Objectives.** To compare first and second-trimester cervical length changes in a selected group of patients and determine a correlation between cervical length and gestational age during delivery.

**Materials and Methods.** The study involved a retrospective analysis of 91 pregnant women who underwent first and second-trimester TVUS cervical length measurements at Kaunas Klinikos Obstetrics and Gynaecology department. Selection criteria included no history of preterm births, singleton pregnancy, at least one previous caesarean delivery. We analysed: maternal age, previous obstetric history, first and second-trimester cervical length, gestational age, mother's BMI, the number of prior births.

**Results.** The average age of patients was 33 (range, 22-41), mean BMI was 25,07 (range, 18,72-36,9). Five premature births occurred, mean gestational age was  $38,95 \pm 2,04$  weeks (range, 25-42 weeks). There was no statistically significant correlation between cervical length in first ( $p=0,071$ ) or second ( $p=0,804$ ) trimesters and the fetuses' gestational age. Correlation between cervical length in the second trimester, and maternal age ( $p=0,832$ ), number of births ( $p=0,500$ ), mother's BMI ( $p=0,240$ ) was not found. Comparing subgroups of women after previous 2 ( $n=20$ ) and 1 ( $n=71$ ) caesarean section, there was no statistically significant difference in mean cervical length:  $33,8 \pm 5,6$  and  $33,8 \pm 5,1$  mm ( $p=0,133$ ) in first trimester,  $34,2 \pm 5,4$  and  $36,4 \pm 4,7$  mm ( $p=0,070$ ) in second trimester. Comparing subgroups of women who experienced vaginal birth after previous caesarean delivery ( $n=6$ ) and who have not ( $n=85$ ), there was no statistically significant differences in cervical lengths:  $35,4 \pm 6,9$  and  $34,2 \pm 5,2$  mm ( $p=0,588$ ) in first trimester,  $36,1 \pm 5,6$  and  $35,9 \pm 4,9$  mm ( $p=0,918$ ) in second trimester.

**Conclusions.** There was no statistically significant correlation between cervical length in first or second trimester and premature birth rate in selected group of patients. Therefore, maternal age, number of prior births, mother's BMI, number of caesarean sections, vaginal birth after caesarean delivery did not have any statistical impact on cervical length.

## GESTATIONAL WEIGHT GAIN AND PREGNANCY COMPLICATIONS

Authors: **Beate Bartaševica**<sup>1</sup>, **Arta Alksnīte**<sup>1</sup>, **Kristine Klaramunta - Antila**<sup>1</sup>

Scientific research supervisor: Asoc. Prof. **Laila Meija**<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Gestation weight gain, pregnancy complications.

**Objectives.** The gestational weight gain (GWG) significantly correlates with gestational complications. The aim of the study was to determine the association between GWG, BMI and gestational complications in pregnant women in Latvia.

**Materials and Methods.** The study has been implemented within the frame of the project LZP Nr. lzp-2019/1-0335 funded by Latvian Council of Science. A cross-sectional survey of 258 women with singleton birth until 7th day post-partum was conducted. Data was obtained using questionnaire and medical documentation from July until October 2020. BMI was classified according to WHO recommendations. Data was analysed using IBM SPSS 26.0.

**Results.** 61.3% (n=155) of women had any pregnancy complication during previous pregnancy. Median weight gain among respondents was 14.09 (SD 6.07). In induced labour group (41.9%) mean GWG was 13.0 (SD 6.9) kg, anemia (37.4%)– 12.8 (SD 4.8) kg, fetal macrosomia (27%)– 14.5 (SD 7.3) kg, preeclampsia/eclampsia (7.1%)– 14.2 (SD 7.0) kg, gestational hypertension (7.1%)– 15.5 (SD 7.8) kg, gestational diabetes (16.8%)– 14.7 (SD 6.6) kg, premature birth (7.1%)– 13.6 (SD 2.8) kg, fetal retardation (1.3%)– 14.5 (SD 7.3) kg, urinary tract infections (10.3%)– 11.7 (SD 5.9) kg. There was no statistically significant difference ( $p > 0.05$ ) of the GWG between women with or without gestational complications and no difference of GWG between different BMI groups and pregnancy complications were found.

**Conclusions.** Median weight gain was in normal weight gain range. Although data didn't showed clear impact of GWG on gestational complications– the highest GWG was determined in gestational hypertension, gestational diabetes and fetal macrosomia groups and the lowest in urinary tract infections and anemia complication groups.

## VALIDITY OF INDICATIONS FOR FETAL ECHOCARDIOGRAPHY IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL

Author: *Roberts Lovcinovskis*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Inguna Lubaua*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Fetal echocardiography, risk factors, indications, extracardiac, cardiac, anomaly, abnormal finding, valid.

**Objectives.** To evaluate the amount of valid and invalid indications for fetal echocardiography referral in Children's Clinical University Hospital (CCUH). To determine the most common indications for fetal echocardiography. To estimate the rate of pathologic findings and their association with risk factors and indications.

**Materials and Methods.** A prospective one center cross sectional study, which included 32 pregnant women aged 18-43 years with a median gestational age of 20+6(Q1;Q3 20+1-22+2)weeks referred for fetal echocardiography by an obstetrician/gynecologist or a geneticist, carried out from November 2020 to January 2021 in Children's Clinical University Hospital using patient questionnaires about potential fetal cardiac defect risk factors, patient information databases and fetal echocardiography findings. Data was analyzed using Microsoft Excel 2016 and IBM SPSS Statistics v23.

**Results.** 31(97%) patients had a valid indication and only 1(3%) had an invalid indication for fetal echocardiography. The invalid indication was maternal arterial hypertension. The most common indications were in vitro fertilization and an extracardiac anomaly on prenatal screening sonography, both of which made up 7(19%) of the cases. The second most common indications were a cardiac abnormality on prenatal sonography and a first degree relative with a congenital heart defect, both of which constituted 5(14%) of cases. 12(38%) patients in the study population had additional significant risk factors, such as smoking and teratogenic drug use. 6(19%) of the patients had an abnormal fetal echocardiographic finding, who all had valid indications for the examination. 3(50%) of the patients with an abnormal fetal echocardiographic finding had one additional risk factor each, including smoking, aspirin use and SARS Covid-19 infection during pregnancy.

**Conclusions.** All but one indication for fetal echocardiography was valid, which points to a good understanding of risks and factors that may significantly affect a developing fetal heart by Latvian obstetricians/gynecologists and geneticists.

## REASONS FOR PSYCHOEMOTIONAL STRESS IN PREGNANT WOMEN IN LATVIA

Author: *Lauma Gulbe*<sup>1</sup>

Scientific research supervisors: Dr. *Elizabete Pumpure*<sup>2,3,4</sup>, Dr. *Dace Matule*<sup>5</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

<sup>3</sup> *Rīga Maternity Hospital, Latvia*

<sup>4</sup> *Rīga East Clinical University hospital, Latvia*

<sup>5</sup> *Matule and Melka gynaecology clinic, Latvia*

**Keywords.** Pregnancy, psychoemotional stress.

**Objectives.** Psychoemotional stress during pregnancy is known to be a risk factor for perinatal complications and assessment of risk factors could be valuable in prevention these complications. The study aims to identify most common causes for psychoemotional stress during pregnancy and to analyse data in relation to the trimester.

**Materials and Methods.** A longitudinal study was conducted in one outpatient clinic and online from July 2020 to January 2021. Data were collected from self-filled questionnaires of 105 pregnant women in their first, second and third trimester. Data was analyzed with Microsoft Excel and SPSS 26.0.

**Results.** Respondents mean age was 29.5 years (SD 5.1). 57.1% (n=60) of women were multiparous and 21% (n=22) of respondents have had missed abortion in medical history. Preliminary data shows that women with lower education level had higher overall distress level in both first (p=0.003) and second trimester (p=0.028), and in first trimester in women with comorbidities (p=0.011). In first trimester women with missed abortion in medical history were more concerned about preterm delivery (p=0.025). Nulliparous women in first trimester more often worried about pregnancy-related costs (p=0.012), but in second trimester about their abilities to take care of the baby (p=0.023). In both first and second trimester women were most concerned about the birth-giving process altogether (32.4%,n=34 vs.35.2%,n=37), pain during the labour (25.7%,n=27), and health of the baby (22.9%,n=24 vs.25.7%,n=27). Pregnancy symptoms were the most worrying issue in first trimester (36.2%,n=38), but it reduced by half in second trimester (17.1%,n=18), however, concerns about preterm delivery were higher in second (11.4%,n=12) than in first (3.8%,n=4) trimester.

**Conclusions.** Lower level of education and comorbidities have been identified as causes of higher overall distress rate for women during pregnancy in both first and second trimester. Nulliparous women are more likely to have higher level of concern about several aspects of pregnancy.

## COMBINATION OF PRE-EMPTIVE PORT-SITE AND INTRAPERITONEAL ROPIVACAINE ANALGESIA FOR REDUCTION OF POSTOPERATIVE PAIN IN GYNAECOLOGICAL LAPAROSCOPY

Author: *Laura Ivanova*<sup>1</sup>

Scientific research supervisor: Dr. *Antons Babuškins*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Latvian Maritime Medicine Centre, Latvia*

**Keywords.** Ropivacaine, gynaecologic laparoscopy, local anaesthetics, preemptive analgesia, wound infiltration, port-site infiltration.

**Objectives.** To compare preincisional and preclosure wound analgesia together with intraperitoneal instillation in reducing pain after laparoscopic surgery and analgesic requirement.

**Materials and Methods.** The prospective study included women undergoing any gynaecological laparoscopy with the time limit of 2 hours, who underwent wound analgesia with 10 ml 0,2% ropivacaine undiluted for port-site and diluted intraperitoneally 10 ml 0,2% ropivacaine with 10ml 0,9% normal saline in Latvian Maritime Medicine Centre and were randomized into three groups. Group 1 pre-incisional (n=11), Group 2 pre-closure (n=11) and Group 3 without analgesia (n=11). Pain was assessed using visual analogue scale (VAS) at 2, 6, 12, 24h after surgery. The requirement of rescue analgesics was recorded.

**Results.** A total of 33 women with 11 patients in each group with mean age 37,7 ( $\pm 10,21$ ) were scheduled for gynaecological laparoscopic surgery. Pain score was largest in all groups 2h after surgery VAS6 (3/11 [27,3%] vs 4/11 [36,4%] vs 3/11 [27,3%]). Patient requirement of additional painkillers was lower in both groups receiving analgesia comparing to control group in all periods after surgery. Most of the patients required pain killers 2h after surgery Group1 vs 2 (5/11 [45,5%] vs 4/10 [40,0%]). No statistical significance was found between preincision and preclosure groups in pain intensity and rescue analgesia requirement. Significantly fewer patients required painkillers for analgesia in the ropivacaine groups than control group- 2h after surgery (p=0.002), 6h after (p=0.005), 12h after (p=0.024), 24h after (p=0.027).

**Conclusions.** Pre-emptive port-site and intraperitoneal anaesthesia is better than no anaesthesia. No difference in time of ropivacaine administration was observed during the study. Combination of pre-emptive port-site plus intraperitoneal ropivacaine to standard postoperative analgesia reduced postoperative additional analgesics requirement in gynaecological laparoscopy.



## PERINEAL WOUND DEHISCENCE: PREVALENCE OF RISK FACTORS AND OUTCOMES

Author: *Anna Pentjugova*<sup>1</sup>

Scientific research supervisor: Dr. *Elizabete Pumpure*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Rīga, Latvia*

<sup>2</sup> *Rīga Maternity Hospital, Latvia*

**Keywords.** Perineal wound dehiscence.

**Objectives.** Childbirth-related perineal trauma (CRPT) affects a vast number of women worldwide, for most of them postnatal recovery is delayed by secondary perineal wound dehiscence and wound infection, that greatly threatens women's general well-being and quality of life. The aim of this study was to evaluate the main factors and co-morbidities, which impact the development of wound dehiscence and necessity to impose secondary sutures.

**Materials and Methods.** The retrospective descriptive study was conducted in Rīga Maternity Hospital by reviewing medical documentation in 2019. A total of 108 women after CRPT or episiotomy were analysed: 54 women with perineal wound dehiscence—research group (RG) and 54 of women in control group (CG). IBM SPSS software was used for data processing.

**Results.** The mean age of the RG was 29.5 (SD±5.2) and CG—29.1 (SD±5.2). Those women, who had first delivery, more frequently were observed in RG (n=46; 85.2%), compared with CG (n=39; 72.2%). Vaginal induced delivery more frequently were observed in RG (n=18; 33.3%) compared to CG (n=9; 16.7% (p=0.046)). The same tendency was observed in vaginal instrumental delivery using vacuum—12 (22.2%) in RG and 10 (18.5%) in CG. The mean birth weight of the RG was 3613.52g (SD±451.9) and CG—3646.63g (SD±469.1). 12 (22.2%) of women in RG had deep vaginal lacerations, compared with 4 (7.4%) in CG (p=0.03). 19 (35.2%) RG patients spent ≥7 days in hospital after delivery, compared with CG—50 (94.3%) of patients spent <7 days in hospital after delivery (p<0.01). 30 (55.5%) out of 54 RG had suture insufficiency that recovered conservatively, the rest 24 (44.4%) women required secondary suturing. Majority of cases in RG happened in summer (n=17; 31.5%), mostly in August (n=7). More often dehiscence diagnosis was established on the 3rd (n=11; 24.4%) day after delivery.

**Conclusions.** The study demonstrates that primigravida women had perineal wound dehiscence more frequently, namely those who had vaginally induced and instrumental delivery using vacuum. Reviewing these cases and identifying risk factors would help to focus additional attention on parturients' problems and allow the treatment to start in appropriate time.

# INTERNAL MEDICINE I: CARDIOLOGY, PULMONOLOGY

## EFFICACY OF RADIOFREQUENCY ABLATION OF ATRIAL FIBRILLATION

Author: *Lolita Ercika*<sup>1</sup>

Scientific research supervisor: Dr. *Kaspars Kupics*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Atrial fibrillation, ablation.

**Objectives.** Atrial fibrillation is an irregular and the most common abnormal electrical activity of atria that is disruptive and can lead to serious complications. Ablation is one of the best proven treatments for atrial fibrillation that guarantees rhythm control, which also proven to be first that results in sustainable higher quality of life for patients after the procedure. The aim of the study is to find out whether the ablation yields satisfactory long time results in patients with atrial fibrillation.

**Materials and Methods.** In this study 80 patients with history of atrial fibrillation whom had ablation procedure, were selected, they were contacted by the telephone with ensuring conversation that was guided by questionnaire and filled in, collected data was analyzed by using IBM SPSS statistics.

**Results.** The descriptive statistics method was used to analyze collected data whether the symptoms of EHRA classification and ablation had been positive for 3, 6 and 12 months after procedure was done. After the first 3 months EHRA I is in 71.3% (n=57) of patients, after 6 months EHRA I is 72.5% (n=58) patients and after 12 months EHRA I is 71.3% (n=57) of patients. Recurrence of atrial fibrillation post-ablation after first 3 months was seen in 30.0% (n=24) of patients, while 70.0% (n=56) of patients had no changes in rhythm. At 6 months recurrence was observed in 28.8% (n=23) of patients, 71.3% (n=57) of patients were without changes and 12 months after the procedure 26.3% (n=21) of patients had recurrence of atrial fibrillation and 73.8% (n=59) none.

**Conclusions.** The results confirm that ablations yields great long time results in termination of atrial fibrillation with this method most patients remain in normal rhythm without symptoms associated with atrial fibrillation and improved quality of life.

## COMPARISON OF ECHOCARDIOGRAPHIC VALUES BETWEEN PATIENTS WITH AND WITHOUT METABOLIC SYNDROME AND DIFFERENT DURATIONS OF ATRIAL FIBRILLATION DIAGNOSIS

Authors: *Natālija Mihejeva*<sup>1</sup>, *Anastasija Zaičenko*<sup>1</sup>,  
*Lelde Gaspersone*<sup>1</sup>, *Aņuta Kīslakova*<sup>1</sup>

Scientific research supervisor: Prof. *Oskars Kalējs*<sup>1,2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Latvia*

**Keywords.** Atrial fibrillation, metabolic syndrome, echocardiography.

**Objectives.** Atrial fibrillation (AF) is a form of supraventricular tachyarrhythmia that leads to the left atrium enlargement and abnormal ejection fraction (EF). Metabolic syndrome (MS) is a collection of cardiovascular disease risk factors.

The aim was to compare echocardiographic values – EF, left atrial dimension (LA) and left atrial volume index (LAVI) – in AF patients with/without MS depending on the duration of AF diagnosis.

**Materials and Methods.** This study includes 88 patients with AF. The participants were divided into 3 groups according to the duration of AF diagnosis: 2 days – 1 year, 1 – 5 years, over 5 years.

**Results.** The median age of patients was 69 (IQR: 60-77), 40.9% (N=36) were women. Of the study population 48.9% (N=43) had metabolic syndrome.

Median LA values were elevated in both patient groups with/without MS regardless of AF duration, with a statistical significance ( $p=0.011$ ) in the 1–5 years AF duration group, respectively, 49 mm in the patient group with MS (IQR: 44-56) and 42.5 mm (IQR: 38.25-45.75) without MS.

Elevated median LAVI values were observed in all AF duration groups with MS, but in patients without MS only in the over 5 years AF duration group. A statistically significant difference ( $p=0.037$ ) was found in the 2 days – 1 year AF duration group comparing patients with/without MS, respectively, 43.5 mm (IQR: 39.5-52.75) vs 30.5 mm (IQR: 24.25-45.25). A statistically significant difference ( $p=0.008$ ) was also found in the 1 – 5 years AF duration group between the patients with/without MS, respectively, 41 mm (IQR: 35-48) vs 33.5 mm (IQR: 28.5-37).

Overall, no statistically significant difference between the groups EF values was found.

**Conclusions.** This study demonstrated a statistically significant difference of LAVI values between AF patients with/without MS in the 2 days–1 year and 1–5 years AF duration groups. Left atrium enlargement appears faster in AF patients with MS.

## A TWO DECADE COMPARISON STUDY OF LEAD-RELATED INFECTIVE ENDOCARDITIS

Author: *Līga Viduša*<sup>1</sup>

Scientific research supervisors: Prof. *Oskars Kalējs*<sup>1,2</sup>, Dr. *Nikolajs Nesterovičs*<sup>1,2</sup>,  
Dr. *Georgijs Nesterovičs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Lead related infective endocarditis (LRIE), cardiac implantable electronic device (CIED), chronic heart failure (CHF), left ventricular ejection fraction (LVEF).

**Objectives.** Population ageing has increased the number of patients with CIED, thereby increasing device related complication cases and following extraction, predominantly due to infections. The aim of the study was to evaluate LRIE patient comorbidities, causal pathogens, antimicrobial resistance, and previously studied risk factor impact on intrahospital mortality in two consequent decades.

**Materials and Methods.** A retrospective study was conducted among patients that were admitted to Pauls Stradiņš Clinical University Hospital, for lead extraction due to LRIE, from year 2000 to 2020. Data from patient history were obtained and analyzed using MS Excel and IBM SPSS, statistical significance was set at  $p < 0.05$ .

**Results.** Overall, 65 patients were included, 24 from year 2000 to 2010, 41 from the following decade, with mean age of 54 (SD 18.9) and 67.8 years (SD 13.2), 4.1% and 20% intrahospital mortality, respectively. Most common comorbidity was CHF, 83.3% and 80.5%, with reduced LVEF for 20% and 38.2%, in comparison. In the first decade both *Staphylococcus aureus* and *Staphylococcus epidermidis* were isolated in 37.5% of cases, most common pathogen in the following decade was *Staphylococcus aureus* (29.3% of cases), its antimicrobial resistance increased by 33.3%. Overall relative risk for intrahospital mortality, from previously studied factors was: age >70 years (RR 1.65; 95% CI [0.48 – 5.59];  $p=0.415$ ), reduced LVEF (RR 2.25; 95% CI [0.68 – 7.44];  $p=0.179$ ), vegetation size >1cm (RR 2.81; 95% CI [0.84 – 9.38];  $p=0.083$ ).

**Conclusions.** The comparison of both decades shows the expected increase in age and number of patients with device related infectious complications, as well as antimicrobial resistance of common pathogens. There is insufficient evidence to conclude that the previously studied risk factors have a statistically significant impact on intrahospital mortality.

## ASSESSMENT OF PATIENT KNOWLEDGE WITH ATRIAL FIBRILLATION

Authors: *Matīss Linde*<sup>1</sup>, *Līga Vīduša*<sup>1</sup>, *Madara Degtareva*<sup>2</sup>

Scientific research supervisors: Dr. med. *Kristīne Jubele*<sup>1,3</sup>, Dr. *Rūta Meijere*<sup>3</sup>,  
Prof. *Oskars Kalējs*<sup>1,3</sup>, Prof. *Aivars Lejnicks*<sup>1,4</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Medical College of the University of Latvia, Latvia*

<sup>3</sup> *Pauls Stradiņš University Hospital, Latvia*

<sup>4</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Atrial fibrillation (AF), questionnaire.

**Objectives.** AF is the most common sustained cardiac arrhythmia in adults. Estimated number of individuals with AF globally in 2016 was 43.6 million. Patient knowledge about AF and its management is often limited particularly when first diagnosed, when the majority of treatment decisions are discussed and made. Ensuring patients are appropriately informed about treatment options, how to adhere to treatment, potential consequences of non-adherence, in addition to managing patient's expectations of treatment goals, are crucial to promote adherence.

**Materials and Methods.** Prospective study of 73 patients with any form of AF using Jessa Atrial Fibrillation Knowledge Questionnaire (JAKQ) – CONFIDENTIAL ©2016 Universiteit Hasselt and Jessa Ziekenhuis (BE).

**Results.** Questionnaire was completed anonymously by outpatients and hospitalized patients. 30 (41 %) patients were below the level of 65 years of age and 43 (59 %) patients were above the level of 65 years of age. 58 (73.4 %) patients are aware of what is AF, 47 (62.7 %) patients have knowledge that AF can cause blood clots and lead to cerebral infarction and 65 (84.4 %) patients are informed that anticoagulants are used to prevent the development of blood clots in heart, which can lead to stroke, but only 46 (61.3 %) patients are aware that by use of anticoagulants bleeding can occur and bleeding time in case of injuries is prolonged. Also 35 (47.9 %) patients do not know if non-vitamin K antagonist oral anticoagulants come with a patient alert card and what is the purpose of it.

**Conclusions.** Although 58 (73.4 %) patients are aware of what is AF, there seemingly exists a knowledge gap about other aspects of AF. Especially the knowledge of managing AF and anticoagulant properties. It is important to assess how patients perceive information and what tools could be used to improve it.

## ASSOCIATION BETWEEN CARDIAC VALVE INTEGRITY AND DISEASE ACTIVITY IN VITILIGO PATIENTS – A CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE

Author: *Mrinalini Devi G.K.V.*<sup>1</sup>

Scientific research supervisor: Prof. *K. R. Senthilkumari*<sup>2</sup>

<sup>1</sup> *Government Villupuram Medical College, India*

<sup>2</sup> *Department of Physiology, Government Villupuram Medical College, India*

**Keywords.** Melanocytes, Mitral Valve Prolapse.

**Objectives.** Vitiligo results from progressive loss of melanocytes. In mice, melanocytes were found in heart valve structures. These melanocytes have been shown to express and secrete metalloproteinases which contribute to valve remodelling and maintenance of valve integrity. The main aim is to evaluate the presence of structural and functional abnormalities of cardiac valves and to correlate the same with level of disease activity in vitiligo patients.

**Materials and Methods.** The study protocol was examined and approved by Institutional Ethical Committee. 25 Vitiligo patients were recruited into the study after getting informed written consent. Two-dimensional echocardiography was performed. The atrioventricular (AV) valve structure and function were analysed in real time and stop frame images in the parasternal long-axis and apical view. Measurement of Disease Activity. Vitiligo Area Severity Index (VASI):= All Body Sites [Hand Units] × Residual Depigmentation. Vitiligo Disease Activity Score (VIDA) : Disease activity was graded as +4 to -1 based on recent disease activity. The data was collected, tabulated and statistically analysed by using SPSS 20. p value < 0.05 was considered significant.

**Results.** Six patients (24%) had MVP AML (Mitral Valve Prolapse Anterior Mitral Leaflet). Five patients (20%) had trivial tricuspid regurgitation. Structural abnormalities of the AV valves were found only among patients with active disease within the past six months.

**Conclusions.** In our study, we found that prevalence of MVP (24%) and trivial mitral regurgitation (16%) was increased in vitiligo patients. Through our study, we would like both vitiligo patients and the treating physicians to be aware that vitiligo is a systemic disease that requires a multidisciplinary management.

## COMPARISON OF ELECTROCARDIOGRAPHIC CHANGES DEPENDING ON TRAINING FREQUENCY IN UNIVERSITY'S VOLLEYBALL TEAM PLAYERS IN LATVIA

Author: *Kalvis Kaļva*<sup>1</sup>

Scientific research supervisors: Dr. *Toms Jānis Eglītis*<sup>1</sup>, Prof. *Oskars Kalējs*<sup>1,2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Pauls Stradiņš University Hospital, Latvia*

**Keywords.** Electrocardiographic changes, training frequency, student sport.

**Objectives.** Regular long-term physical activity can lead to the development of various physiological changes in the heart. It is important to find out how many workouts per week could indicate to doctor use standard or athlete electrocardiogram (ECG) interpretation criteria. The aim of this research was to perform resting 12-lead ECG for volleyball teams of universities in Latvia and analyse them by using International criteria for electrocardiographic interpretation in athletes.

**Materials and Methods.** A prospective study where volleyball athletes from universities of Latvia recorded a resting 12-lead ECG. Research takes place from November 2019 till March 2020 in universities sports clubs. SPSS 23 was used for statistical analysis (Chi-Square test).

**Results.** In research participated 154 athletes: 84 women (54.5%) and 70 men (45.5%) with an average age of 23.9 years (SD 5.4 years). There were 44 (28.6%) athletes who did not have any changes in their resting 12-lead ECG. 57 (37.0%) athletes were found to have 1 physiological change, but 53 (34.4%) athletes had at least 2 physiological changes in their resting 12-lead ECG. There was a statistically significant difference between athletes' number of changes in their ECG and number of training sessions per week. 30 (40.5%) athletes who train more than 3 times a week have at least 2 physiological ECG changes, but only 15 (20.3%) athletes did not have any changes in their resting 12-lead ECG. In turn 29 (36.3%) athletes who train 1 to 3 times a week did not have any changes in their resting 12-lead ECG ( $P=0.023$ ).

**Conclusions.** Athletes who train more than 3 times a week have at least 2 physiological ECG changes than those athletes who train 1 to 3 times a week. Further research is needed to increase the study population and to completely assess the cardiovascular health of Latvian student-athletes.

## LONG-TERM OUTCOME OF CRYPTOGENIC STROKE PATIENTS FOLLOWING PATENT FORAMEN OVALE CLOSURE

Author: *Agnete Teivāne*<sup>1</sup>

Scientific research supervisors: Dr. *Kristaps Jurjāns*<sup>3</sup>, Dr. *Krista Lazdovska*<sup>3</sup>,  
Dr. *Artūrs Balodis*<sup>4</sup>, Asoc. Prof. *Evija Miglāne*<sup>2</sup>, Dr. *Ainārs Rudzītis*<sup>5</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia*

<sup>3</sup>*Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia*

<sup>4</sup>*Pauls Stradiņš Clinical University Hospital, Institute of Diagnostic Radiology, Latvia*

<sup>5</sup>*Pauls Stradiņš Clinical University hospital, Latvian Centre of Cardiology, Latvia*

**Keywords.** Patent foramen ovale. Stroke. Ischemic stroke. Cryptogenic stroke. PFO closure. Paradoxical embolism. Recurrent stroke.

**Objectives.** The pathogenic ischemic stroke subtypes are determined using CCS (Causative Classification System for Ischemic Stroke). According to current guidelines in cryptogenic stroke patients with patent foramen ovale (PFO), PFO closure is recommended for secondary stroke prevention. As the mechanism of stroke in these cases a paradoxical embolism from PFO mediated right-to-left shunt or cardioembolism has been described. The PFO closure has been available in Pauls Stradiņš Clinical University hospital since 2004.

The aim of the study was to assess the long-term effectiveness of PFO closure on recurrent stroke risk reduction.

**Materials and Methods.** A total of 103 patients were enrolled in a prospective study and followed up by phone after 90 days, 180 days, 1 year, 2 years, 3 years, 4 years, and 5 years after PFO closure. Standardized survey was conducted about their well-being, recurrent cerebrovascular events, and the use of prescribed medication.

**Results.** Of 103 patients included - 56,3% (n=58) were female. The mean age was 44±13 (18-75). According to CSS 66,7% (n=58) of patients had possible cardio-aortic embolism (or paradoxical embolism) and 19,5% (n=17) had evident small artery occlusion. Before PFO closure 91,9% (n=91) of patients had at least one stroke or transient ischemic attack and in five-year time after PFO closure recurrent stroke or transient ischemic attack was reported in only 5,1% (n=5) of patients, this difference is statistically relevant (p<0.001). Secondary stroke prevention with antiplatelet agents is still being used in 55,6% (n=55) of patients, oral anticoagulants - 6,1% (n=6) and 59,6% (n=59) of patients are using no antithrombotic therapy.

**Conclusions.** PFO is a possible risk factor for cryptogenic stroke in young adults. PFO closure might be effective in reducing recurrent cerebrovascular events. Majority of patients do not require long-term antithrombotic therapy after the procedure.



## THE IMPACT OF PULMONARY VEIN ORIENTATION FOUND IN COMPUTED TOMOGRAPHY ON CHARACTERISTICS OF ELECTROCARDIOGRAM P WAVE

Author: *Viktorija Verhovceva*<sup>1</sup>

Scientific research supervisors: Dr. *Ligita Zvaigzne*<sup>2</sup>, Prof. *Oskars Kalējs*<sup>1,2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Electrocardiography, left atrium anatomy.

**Objectives.** An electrocardiogram is a simple, affordable and easily accessible test, which helps to measure the electric activity of the heart. A cardiac CT scan is more expensive and requires specifically educated personnel to perform. The aim of the study was to evaluate statistically significant associations between the orientation of pulmonary veins and characteristics of ECG P wave.

**Materials and Methods.** The retrospective study included 140 patients hospitalized in Pauls Stradiņš Clinical University Hospital with diagnosis of peripheral artery disease. The cardiac computed tomography data were analyzed by making 3D reconstruction models of the left atrium.

**Results.** Among all the patients included in the study 24.8% (31) were women, mean age was 66.9 years (SD = 7.9). In statistical analysis, it was found out that the number of pulmonary vein orifices on the right side had a statistically significant positive correlation with ECG P wave axis ( $rs=0.239$ ,  $p=0.008$ ), and the number of left pulmonary vein orifices had a statistically significant distribution difference among P wave notching groups found in lead II ( $p=0.026$ ).

The angle between the left superior and inferior pulmonary veins negatively correlated with the volume of the left atrial appendage ( $rs= -0.269$ ,  $p=0.002$ ), the right angle showed no significant correlation with the left atrium appendage volume ( $p=0.678$ ). The angle between pulmonary veins on the left side showed statistically significant differences between left atrial appendage morphology groups ( $p=0.019$ ), there was not found any right pulmonary vein angle difference ( $p=0.688$ ).

The distance between pulmonary vein orifices on the right side negatively correlated with the amplitude of ECG P wave ( $rs=-0.193$ ,  $p=0.047$ ). There was a positive correlation between the right and left pulmonary vein angle ( $rs=0.325$ ,  $p<0.001$ ).

**Conclusions.** There were noteworthy associations between the pulmonary vein orientation and ECG findings. The correlations found in the research were not strong, but still statistically significant.

## POTENTIAL OF INTERVENTION TIMING-RELATED CRITERIA FOR ELECTRICAL CARIOVERSION ELIGIBILITY EVALUATION IN PATIENTS WITH PERSISTENT ATRIAL FIBRILLATION

Author: *Baiba Kokina*<sup>1</sup>

Scientific research supervisor: Prof. *Oskars Kalējs*<sup>2,3</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga Stradiņš University, Department of Internal Diseases, Latvia*

<sup>3</sup>*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Latvia*

**Keywords.** Persistent AF, ECV, Intervention timing, Arrhythmia relapse.

**Objectives.** Sinus rhythm maintenance outcomes after electrical cardioversion (ECV) for atrial fibrillation (AF) are variable. AF relapse-predisposing factors are emphasized in different studies, with limited data regarding impact of procedure timing. Aim was to assess potential of intervention timing-related criteria (current AF episode duration and total AF history) for evaluation of eligibility for ECV of patients with persistent/longstanding persistent AF.

**Materials and Methods.** Research was conducted among patients with persistent/longstanding persistent AF after successful ECV in Latvian Centre of Cardiology. Postprocedural antiarrhythmic drug (AAD) prescription was required for similar baseline prospects. Data was collected during face-to-face interview and 1-, 3-, 6-, 9-, 12-month follow-up. Patient adherence and sinus rhythm maintenance was mainly evaluated. Statistical analysis was carried out with SPSS Statistics software ( $\alpha=0.05$ ).

**Results.** Among 103 included patients, 12-month AF relapse rate comprised 46.6%. Baseline AF episode duration had no statistically significant influence on AF recurrence odds (OR 1.004, 95%CI 0.993-1.014,  $p=0.507$ ). Total AF history demonstrated significant impact, each extra month increasing prospects of AF relapse by 2.1% (OR 1.021, 95%CI 1.008-1.034,  $p=0.001$ ). Additionally, in regression model with AF history, AAD choice did not result in statistically significant effect on outcome. In Cox regression analysis, one-month AF history did not significantly influence cumulative AF recurrence, yet demonstrating notable reduction tendency (HR 0.371, 95%CI 0.133-1.033,  $p=0.058$ ). Nevertheless, more than 6 months since diagnosis had statistically significant impact with almost twofold increase in cumulative AF recurrence (HR 1.973, 95%CI 1.042-3.735,  $p=0.037$ ), with growing negative prognosis for AF history exceeding 12 months, where cumulative AF recurrence increased over two times (HR 2.101, 95%CI 1.169-3.777,  $p=0.013$ ).

**Conclusions.** Total AF history has statistically significant progressive impact on arrhythmia relapse after ECV in patients with persistent/longstanding persistent AF, suggesting its potential applicability for procedural eligibility evaluation with questionable benefits established already after 6-month period.

## VARIANTS IN NEURL1 AND PITX2 GENES ARE ASSOCIATED WITH THE RISK OF DEVELOPING ATRIAL FIBRILLATION BUT NOT WITH THE EFFICACY OF CARIOVERSION THERAPY

Authors: *Simon Vogel*<sup>1</sup>, *Jekaterina Isakova*<sup>1</sup>

Scientific research supervisors: Dr. *Irina Rudaka*<sup>1</sup>, Dr. *Dmitrijs Rots*<sup>1</sup>,  
Dr. med. *Linda Gailite*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Atrial fibrillation, direct current cardioversion, polygenic risk score, NEURL1, PITX2.

**Objectives.** Atrial Fibrillation (AF) is the most common arrhythmia. Recurrence of (AF) within <6 months after sinus rhythm restoration with direct current cardioversion (DCC) is a significant treatment challenge. Currently, the factors influencing the outcome are mostly unknown. Studies have found a link between genetics and risk of AF and the efficacy of rhythm control. The aim of the study was to examine the association between nine single nucleotide variants (SNVs) and the risk of AF development and recurrence after DCC.

**Materials and Methods.** The study included 96 AF cases (male = 64) at mean age  $61.7 \pm 2.03$  and 113 controls (male = 40) at age =  $61.3 \pm 1.77$ . Genotypes for the 9 SNVs CAV1, MYH7, SOX5, KCNN3, NEURL1, ZFXH3, KCNJ5 and PITX2 genes were determined using high resolution melting analysis and confirmed with Sanger sequencing.

The efficacy of cardioversion was determined by the presence of AF after 6 months via an interview. The polygenic risk score (PRS) was calculated as the unweighted sum of risk-alleles based on SNVs with a  $p < 0.05$ .

**Results.** Three SNVs were significantly associated with the risk of developing AF: NEURL1 – rs11598047 [OR (95%CI)=2.052 (1.169-3.602),  $p=0.012$ ], and two PITX2 variants – rs2200733 [OR (95%CI)=1.885(1.067-3.329),  $p=0.029$ ] and rs6838973 [OR(95%CI)=2.117(1.047-4.280),  $p=0.037$ ]. The AF recurrence rate after 6 months was 58%. Variants separately, as well as in cases with high a high polygenic risk score [PRS>3], were not significantly associated with AF recurrence 6 months after cardioversion [OR(95%CI)=2.298(0.258-20.442),  $p=0.456$ ].

**Conclusions.** Of the nine SNVs analyzed, only NEURL1 (rs11598047) and two PITX2 (rs2200733 and rs6838973) SNVs were significantly associated with an increased risk for AF. Further studies are needed to predict the success of rhythm control and guide patient selection towards the most efficacious treatment.

## ESTIMATING THE EFFICACY OF SCALOGRAM TRANSFORM AS PREPROCESSING STEP IN ECG GENDER NEURAL NETWORK CLASSIFIER

Author: *Nikita Stepanovs*<sup>1</sup>

Scientific research supervisor: Dr. *Irina Holste*<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga East Clinical University Hospital, Latvia*

**Keywords.** Electrocardiogram (ECG), scalogram (SCG), neural networks (NN).

**Objectives.** Current CVD risk prediction models based on NNs such as Inception are subject to overfitting, due to low number of features that is possible to extract from ECG. As a result NNs perform poorly on test data and show low explanatory power. In this thesis, SCG transform will be applied to ECGs in attempt to increase number of features extracted.

**Materials and Methods.** 20,000 ECGs were obtained from the public database PTB-XL. Next, data was cleaned, missing entries were deleted. Gender was encoded for male and female respectively as ECG classifier labels. ECG signals vary both in frequency and in time domain, therefore, most yielding transform is SCG wavelet. SCG wavelet prevents loss of data, by accounting for both frequency and time of a particular point on ECG trace. After experimenting with several wavelets 'Morl' was chosen. All ECGs were transformed into 32×32 and 64×64 pixel SCGs. Next, SCGs were fed into convolutional NN (ResNet-50). Finally, model's explanatory power was evaluated on the test set and compared with model performance when no SCG transforms were applied.

**Results.** When no SCG transforms were applied, the accuracy on the test set was around 30% at 50 epochs. With SCG transform and matrix size of 32×32 accuracy values increased by approx. 30%, with classifying the gender in 65% of test ECGs correctly; for 64×64 pixels the accuracy is 72.22% and AUC = 0.84. Increase in pixel number led to more accurate classification of male ECGs, as in the experiment with the matrix size of 64 big increase in true positive values was observed for male gender.

**Conclusions.** SCG yields more features than conventional ECG preprocessing techniques, which makes it a very valuable preprocessing step. Increase in SCG size resulted in higher accuracy and increased number of true positive samples in male gender.

## RISK FACTORS AND TREATMENT IN ASSOCIATION WITH CLINICAL OUTCOMES IN CANCER PATIENTS WITH VENOUS THROMBOEMBOLISM

Authors: *Elīna Rūsa*<sup>1</sup>, *Anastasija Zaičenko*<sup>1</sup>, *Jānis Birzulis*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Andris Skride*<sup>1,2</sup>, Dr. *Sintija Strautmane*<sup>1,2</sup>, Dr. *Valdis Ģibietis*<sup>1,2</sup>, Dr. *Dana Kigitoviča*<sup>1,2</sup>, Dr. *Kristīne Maķe*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Venous thromboembolism, anticoagulants, cancer.

**Objectives.** Venous thromboembolism (VTE) is one of the leading causes of mortality worldwide. Cancer is a major risk factor for death in VTE patients. This study aimed to determine risk factors and treatment impact on the outcomes of cancer patients with VTE.

**Materials and Methods.** A prospective cohort study enrolling consecutive patients with VTE was conducted in a single clinical university hospital from 2014 till 2020. The localization of the emboli was categorized as central (saddle or main pulmonary artery) and distal/peripheral. Active cancer was defined as newly diagnosed, undergoing treatment, or as metastatic disease. Thromboembolic event was defined as acute pulmonary embolism (PE). Patients were subcategorized into vitamin K antagonist (VKA) and direct oral anticoagulant (DOAC) users.

**Results.** The study included 478 patients of which 14.4% (n=69) were cancer patients. In multivariable analysis, cancer was an independent risk factor for mortality (HR 4.2; 95% CI 2.5 - 7.3, p<0.001). Atrial fibrillation (AF) was associated with increased 90-day mortality in patients with vs without cancer (HR 2.9; 95% CI: 1.1-8.2; p=0.045) vs (2.8; 95% CI: 1.36-5.86; p=0.005). Higher 1-year mortality was associated with AF (HR 2.4; 95% CI: 1.39-4.34; p=0.002), diabetes (HR 2.0; 95% CI: 1.07-3.8; p=0.03), history of peripheral artery disease (HR 3.2; 95% CI: 1.5-6.8; p=0.002) in patients without cancer, but none of these risk factors were associated with higher 1-year mortality in cancer patients. Central PE was not associated with higher mortality in any patient group.

90-day mortality was lower in cancer patients using DOAC (HR=0.19; 95% CI: 0.76 - 0.48). No significant association was observed between anticoagulant groups and thromboembolic recurrence in cancer patients, p>0.05.

**Conclusions.** Atrial fibrillation is associated with higher 1-year and 90-day mortality. Central PE was not associated with higher mortality. DOAC could be used as an alternative treatment of PE in cancer patients.

# INTERNAL MEDICINE II: GASTROENTEROLOGY, NEPHROLOGY, ENDOCRINOLOGY, RHEUMATOLOGY

## PREDICTING CANCER BIOMARKER SUCCESS

Authors: *Rahul Penumaka*<sup>1</sup>, *Katerina-Vanessa Savva*<sup>1</sup>, *Melody Ni*<sup>1</sup>, *Christopher Peters*<sup>1</sup>

Scientific research supervisor: *Christopher Peters*<sup>1</sup>

<sup>1</sup>*Imperial Collage London, United Kingdom*

**Keywords.** Breast cancer, cancer biomarkers.

**Objectives.** Technological advances have resulted in large numbers of cancer biomarkers being discovered. However, the number of biomarkers entering clinical practice is disproportionately low. Ongoing research at Imperial College London (ICL) hopes to address this gap through the creation of a 'Biomarker Toolkit'. The toolkit will provide quantifiable scores of cancer biomarker publications, thus, helping to identify biomarkers with the highest likelihood of clinical implementation. The first stage of development involves creation and validation of a checklist comprised of characteristics associated with successful biomarker translation. (1) Develop a checklist with characteristics related to successful cancer biomarker translation (2) Validate the checklist by applying it on successfully translated and stalled biomarker publications (3) Assess the checklist for risk of assessor bias.

**Materials and Methods.** A literature search was conducted using MEDLINE and EMBASE databases to identify publications on successful biomarker translation. Relevant studies (n=88) were used to form a checklist divided into four categories. Studies (n=68) on translated (PAM50) and stalled (Breast Cancer Index, Mammostrat, BreastPRS, Two-gene expression) breast cancer biomarkers were scored using the checklist. Checklist characteristics at risk of assessor bias were identified and removed. Publications were then rescored.

**Results.** The translated biomarker scored ( $47.3\% \pm 2.40\%$ ) significantly higher on the checklist than stalled biomarkers ( $32.0\% \pm 2.39\%$ ) ( $P \leq 0.001$ ). In the categories of analytical validity and clinical utility, the translated biomarker ( $51.7\% \pm 2.19\%$  and  $41.5\% \pm 6.47\%$ ) also scored significantly higher than the stalled biomarkers ( $33.8\% \pm 1.70\%$  and  $11.1\% \pm 2.78\%$ ) ( $P \leq 0.001$ ). There was no significant difference in scores before and after removal of characteristics at risk of bias.

**Conclusions.** The formulated biomarker checklist successfully differentiated between translated and stalled biomarkers. The impact of assessor bias was minimal. This validates previous findings by ICL. Successful validation of the biomarker checklist allows for further development of the Biomarker Toolkit, which can be used to direct research and promote clinical adoption of biomarkers.

## ANALYSIS OF NONIMMUNOLOGIC FACTORS FOR DELAYED GRAFT FUNCTION COMPARING TWO KIDNEYS FROM THE SAME DECEASED DONOR

Author: *Sintija Stūrīte*<sup>1</sup>

Scientific research supervisors: Dr. med. *Ieva Ziediņa*<sup>1,2</sup>, *Ella Šebeko*<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Kidney transplantation, delayed graft function.

**Objectives.** To determine potential nonimmunologic risk factors for delayed graft function in both kidneys from the same deceased donor.

**Materials and Methods.** We retrospectively analyzed 92 kidney grafts from 46 deceased donors that were implanted in 92 recipients at Pauls Stradiņš Clinical University Hospital, Centre of Transplantation between 2016 - 2018. We compared kidney pairs with primary functioning kidneys in both recipients (group 1) to pairs with one recipient with primary graft function and other recipient with delayed graft function (group 2) and pairs with delayed graft function in both recipients (group 3). Data was analyzed using IBM SPSS Statistics 26.0 software.

**Results.** The percentage of obese donors with body mass index higher than 30 kg/m<sup>2</sup> was higher in group 3 (57,1%) compared to group 1 (21,5%),  $p = 0,017$ . Percentage of donors with GFR lower than 45 mL/min/1,73m<sup>2</sup> was higher in group 3 (57,1%) compared to group 1 (24,2%),  $p = 0,024$ . The percentage of kidneys from expanded donor criteria was higher in group 3 (71,4%) compared to group 1 (30,3%),  $p = 0,006$ . Cold ischemia time (CIT), gender of donor, the percentage of donors older than 60 years, donor urine NGAL, recipient age, recipient gender, the percentage of recipients with more than one transplantation did not significantly differ between groups 1 and 3. CIT was significantly higher in recipients who received the second allograft (13,7 (4,8) vs 20,1 (4,7) hours,  $p < .001$ ). We did not observe an impact on primary graft function comparing the sequentially transplanted kidneys. Donor glomerular filtration rate at the first year after transplantation did not differ between the two groups.

**Conclusions.** Donor body mass index higher than 30 kg/m<sup>2</sup>, donor eGFR lower than 45 mL/min/1,73m<sup>2</sup> and kidneys from expanded donor criteria are important factors for delayed graft function in both kidneys from same deceased donor.

## THE ROLE OF BNIP3 IN CELLULAR RESPONSE TO HYPOXIA AND NECTOPTOSIS INDUCTION

Authors: **Victoria Zaitceva**<sup>1</sup>, **Anna Gorbunova**<sup>1</sup>  
Scientific research supervisor: Dr. **Gelina Kopeina**<sup>1</sup>

<sup>1</sup> *Lomonosov Moscow State University, Russia*

**Keywords.** Necroptosis, hypoxia, cell death, cancer.

**Objectives.** The objective of this study was to investigate the role of BNIP3 in necroptosis and response on hypoxia. Hypoxia is one of the main features of solid tumors, which provokes genomic instability and tendency of cancer cells to metastasise. HIF-1 $\alpha$ , a key mediator in cellular response to hypoxia, increases expression of Bnip3 gene, which has both pro- and antiapoptotic functions. Hypoxia is known to cause HIF-1 $\alpha$ -dependent apoptosis; moreover, recent data showed that HIF-1 $\alpha$  also could induce necroptosis (the programmed form of necrosis). As mentioned above, BNIP3 participates in apoptosis regulation; however, his role in necroptosis remains unknown. It is possible that HIF-1 $\alpha$ -induced necroptosis is mediated by BNIP3. Counting the fact that under certain circumstances BNIP3 plays antiapoptotic role, it possibly can affect necroptosis.

**Materials and Methods.** Lung adenocarcinoma cell line A549, western blotting, real-time PCR.

**Results.** We investigated the role of BNIP3 in hypoxia imitation conditions and in necroptosis in wild type and in BNIP3-deprived lung adenocarcinoma cell line A549. The real-time PCR has shown that BNIP3-deprived cells have the higher level of HIF-1 $\alpha$  mRNA level both in normoxia and hypoxia. The Western-blot assay confirmed that the level of HIF-1 $\alpha$  transcriptional target - the glycolysis enzyme hexokinase 2 - is higher in BNIP3-deprived cells. Also, the western blot assay revealed that DNA damage causes the higher level of phosphorylation of RIP1, which is the main necroptosis regulation kinase, in BNIP3-deprived cells compared to the wild type. Based on these facts it is possible to speculate that BNIP3-deprived cells are more prone to necroptosis under genotoxic stress.

**Conclusion.** Our results show that BNIP3 could be a negative regulator of the HIF-1 $\alpha$  level and necroptosis. It allows to consider BNIP3 as a target to increase the sensitivity of cancer cells to necroptosis. This is particularly important for treatment of apoptosis-resistant tumours.



## ASSOCIATION BETWEEN INDIVIDUALS HEALTH WITH MOST COMMON GASTROINTESTINAL TRACT SYMPTOMS WITH FOUR WEEK COURSE NUTRITIONAL SUPPLEMENT "BLACK STUFF"

Author: *Beāte Jurševska*<sup>1</sup>

Scientific research supervisor: Prof. *Juris Pokrotnieks*<sup>1,2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Nutritional supplement, "Black Stuff", gastroenterology.

**Objectives.** Intensive farming practices have reduced soil's (S) capacity to regenerate itself. S is deficient in humic substances (HS) and cannot provide sufficient quantities which are necessary for normal human diet. "Black Stuff" (BS) is a natural compound of birch and chaga mushroom extract that contains large amounts of HS. The aim was to evaluate the effect on most common gastrointestinal tract symptoms (GTS) with four-week course nutritional supplement BS.

**Materials and Methods.** A pilot study was performed on participants aged 18 – 80 between September 1st to December 31st. Participants were given a 30 g package of BS powder for 4 weeks, surveyed using questionnaires at 0, 14 (+7) and 30 (+7) days. Data were summarized using MS Excel and statistically analysed with SPSS. Spearman's correlation analysis was used for determination of correlations between BS effect on participants overall health (OH) at 0, 14 (+7) and 30 (+7) days.

**Results.** 31 participants were included – 58.1% women and 41.9% men. Participant's mean age group was 20-39 years old [95% CI: 41.9 - 77.4]. Most common OH rate was 2-3 in a scale 0 - 10 ("very good – very poor") with an increase from 32.2% at 0 days to 48.4% after 4 weeks. Moderate positive correlation was found at 0 days versus 4 weeks ( $r_s=0.658$ ,  $p<0.01$ ). Amongst all the GTS significant strong correlations were found between diarrhoea after 2 versus 4 weeks ( $r_s=0.817$ ,  $p<0.001$ ) and burning in stomach at 0 days versus 2 weeks ( $r_s=0.996$ ,  $p<0.001$ ) and 0 days versus 4 weeks ( $r_s=0.876$ ,  $p<0.001$ ).

**Conclusions.** The findings of this study showed that individual's OH increase may be associated with BS four-week course, with the most significant effect on reducing diarrhoea and burning in stomach. Further research should be conducted to assess the study's outcomes in a more general patient population.

## MAIN CAUSES FOR DIABETIC KETOACIDOSIS IN DECOMPENSATED DIABETIC PATIENTS, RETROSPECTIVE STUDY 2015–2019 IN RĪGA EAST UNIVERSITY HOSPITAL

Authors: *Mārtiņš Danefelds*<sup>1</sup>, *Anna Jete Gauja*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Ilze Konrāde*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Diabetic ketoacidosis, diabetes mellitus.

**Objectives.** One of the most life-threatening complications of diabetes mellitus (DM) is diabetic ketoacidosis (DKA). DKA diagnostic criteria: hyperglycemia (>13,9 mmol/L), metabolic acidosis (pH<7,3), and increased ketonaemia (>3 mmol/L) or significant ketonuria. This study focuses on the prevalence of DKA among DM patients and the main causes.

**Materials and Methods.** A retrospective data analysis was made including 445 patients diagnosed and hospitalized at the Rīga East University hospital with DKA in 2015-2019. Data analysis with SPSS 26.0.

**Results.** In the 5 year period, from 445 decompensated and hospitalized patients with diagnosed DKA, 36,3% (n=163) had type 1 DM (DM1), 47,9% (n=213) had type 2 DM (DM2), 13,5% (n=60) other etiology, 2% (n=9) no information on the DM type. For 2,5% (n=11) patients the decompensation cause was unknown. Further analysis included DM1 and DM2 patient groups. Causes of decompensation for DM1 patients (n=157): newly diagnosed DM 29,3% (n=46); alcohol abuse 19,1% (n=30); DM gradual decompensation 17,8% (n=28); skipped insulin injections 17,8% (n=28); infection 10,2% (n=16); decompensation associated with chronic illness 5,7% (n=9). Causes of decompensation for DM2 patients (n=211): newly diagnosed DM 39,3% (n=83); alcohol abuse 4,7% (n=10); DM gradual decompensation 28,9% (n=61); skipped insulin injections 8,5% (n=18); infection 8,1% (n=17); decompensation associated with chronic illness 10,4% (n=22).

**Conclusions.** The causes of decompensation leading to DKA had statistically significant (p<0,001) differences between DM1 and DM2 patients. The most frequent cause being newly diagnosed DM for both DM2 and DM1. This study shows specific groups of diabetic patients, which could potentially need improved outpatient care and instructing.

## LENGTH OF STAY IN HOSPITAL FOR PATIENTS WITH DIABETIC KETOACIDOSIS DEPENDING ON THE DECOMPENSATION CAUSE IN RĪGA EAST UNIVERSITY HOSPITAL

Authors: *Mārtiņš Danefelds*<sup>1</sup>, *Anna Jete Gauja*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Ilze Konrāde*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Diabetic ketoacidosis, length of stay, diabetes mellitus.

**Objectives.** Diabetic ketoacidosis (DKA) remains to be a serious acute complication for patients with diabetes mellitus (DM). The biochemical parameter state of the patient indicates the severity of DKA and predicted length of stay (LOS) at the hospital, but other studies suggest that the cause of decompensation for diabetes mellitus also could affect the predicted LOS. The objective of the study was to examine the correlation between the different causes of decompensation and LOS.

**Materials and Methods.** 434 patients were included in the study with a known decompensation cause leading to DKA and a known LOS at Rīga East University Hospital from the year 2015 until 2019. A retrospective study was performed and statistically analysed with SPSS 26.0.

**Results.** From the 434 patients, 11.8% (n=51) had a decompensation cause of skipped insulin injections with the median LOS (mLOS) 8.0 days (IQR=7-11); 11.5% (n=50) with alcohol abuse mLOS 6.5 days (IQR=5-10); 8.5% (n=37) with infection mLOS 9.0 days (IQR=7-12); 7.6% (n=33) with decompensation associated with chronic illness mLOS 9.0 days (IQR=5-12.5); 38.2% (n=166) with newly diagnosed DM mLOS 9.0 days (IQR=8-10); 22.4% (n=97) with gradual DM decompensation mLOS 9.0 days (n=6-11).

**Conclusions.** A statistically significant decrease in LOS was observed for patients with decompensation cause of alcohol abuse compared with other causes: infection (p=0,006), gradual DM decompensation (p=0,006) and newly diagnosed DM (p=0,001). This study shows that these findings may initially assist in predicting the LOS for patients with DKA. Further research would be needed to assess the correlation of treatment approaches, initial biochemical markers, and LOS to find the cause for such differences in LOS.

## CLINICAL MANIFESTATIONS OF AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE

Author: *Diana Druse*<sup>1</sup>

Scientific research supervisor: Dr. med. *Ieva Ziedina*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Polycystic kidney disease, renal transplantation, arterial hypertension.

**Objectives.** Autosomal dominant polycystic kidney disease (AD PKD) is a multisystemic and progressive hereditary disorder. AD PKD progression leads to end - stage renal disease and need for renal replacement therapy. The aim of the study is to analyze the most common clinical manifestations of the disease and the age at diagnosis and at the initiation of renal replacement therapy.

**Materials and Methods.** A retrospective study was made including 90 patients with AD PKD from Pauls Stradiņš Clinical University Hospital outpatient clinic. Data were collected from ambulatory cards and were analyzed by IBM SPSS Statistics version 26.0 ( $p < 0.05$ ). The study was approved by the Institutional Ethics Review Board.

**Results.** 90 patients with the median age of  $62 \pm 10.2$ SD years, 65 (72.2%) were females and 25 (27.8%) were males. Documentary positive family history was present in 32 patients (35.6%). The patients' median age of the diagnosis was  $35 \pm 9.36$  years in men and  $33 \pm 9.82$  in women. The most common clinical manifestation was chronic kidney disease, which was present in all the patients. Arterial hypertension presented in 86.7%, anemia in 52.2% and recurrent UTI 46.7% of patients. The median age at the initiation of renal replacement therapy was  $51 \pm 8.51$  years, ( $52.02 \pm 7.26$  years in women and  $48 \pm 10.54$  years in men). Renal transplantation was done in 85 patients at the median age  $53 \pm 8.12$  years ( $53 \pm 6.8$  years in women and  $49.5 \pm 10.41$  years in men). Most common extra - renal manifestations were liver cysts (91.1%), hernias (15.6%) and diverticulosis (13.3%).

**Conclusions.** The most common renal manifestations of autosomal dominant polycystic kidney disease are chronic kidney disease and secondary arterial hypertension. The most common extra - renal manifestation is liver cysts.

## THE ROLE OF STRESS IN THE PATHOGENESIS OF AUTOIMMUNE THYROID DISEASES

Author: *Deniss Gogins*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Ilze Konrāde*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Autoimmune thyroiditis, Graves' disease, autoimmunity, stress.

**Objectives.** Autoimmune thyroid diseases are multifactorial disorders. The role of psychosocial stress as the environmental factor in the pathogenesis of autoimmune thyroid diseases is still unclear despite a good theoretical base. This research aims to describe the relationship between psychosocial stress and the pathogenesis of thyroid autoimmune diseases.

**Materials and Methods.** In this research, 99 patients were included. The study cohort was divided into two groups: patients with autoimmune thyroid disease (Graves' disease or Autoimmune thyroiditis) (n=61) and healthy controls (n=38). Blood samples were obtained to assess the levels of thyroid peroxidase (TPO) antibodies, TSH receptor antibodies, free triiodothyronine, and thyroxine. The level of psychosocial stress was assessed by an international questionnaire on Recent Experienced Stressful Life Events. Patients were asked to fill the survey about other factors that influence the pathogenesis of thyroid autoimmune disorders. Data were analyzed by using IBM SPSS version 26.0.

**Results.** There is a weak but statistically significant relationship between TPO antibodies level and negative psychosocial stress  $r(87)=0,337$ ,  $p=0,001$ . Linear regression analysis showed that when the level of negative stress increases by 1 unit, the level of TPO antibodies increases by 14,288 units (95% CI 0,717- 27,86) and this relationship is statistically significant ( $t=2,093$ ;  $p = 0,039$ ). According to the binary logistic regression model, an increase in the level of negative stress by one unit increases the odds of being diagnosed with autoimmune thyroid disease by 9,3% (95% CI 1,1% - 18,1%) after adjusting for age. The relationship between thyroid hormones, TSH receptor antibodies and negative psychosocial stress was not statistically significant-  $fT_3$  ( $p=0,052$ );  $fT_4$  ( $p=0,236$ ); TSH-R antibodies ( $p=0,271$ ).

**Conclusions.** The data suggest that the relationship between psychosocial stress and autoimmune thyroid diseases is of greater importance in patients with autoimmune thyroiditis, but not in patients with Graves' disease.

## HEALTH OUTCOMES AND ECONOMICAL COSTS OF PITUITARY NEUROENDOCRINE TUMOURS IN LATVIA: STUDY OF STATE MEDICAL DOCUMENTATION

Author: *Oļesja Rogoza*<sup>1</sup>

Scientific research supervisors: Dr. Biol. *Vita Rovīte*<sup>2</sup>, Dr. *Raitis Pečulis*<sup>2</sup>, *Jānis Pjalkovskis*<sup>2</sup>, *Kaspars Megnis*<sup>2</sup>, Asoc. Prof. *Ilze Konrāde*<sup>3</sup>, Dr. *Inga Balcere*<sup>3</sup>, Prof. *Valdis Pīrāgs*<sup>4</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Latvian Biomedical Research and Study Centre, Latvia*

<sup>3</sup> *Rīga Stradiņš university, Latvia*

<sup>4</sup> *Pauls Stradiņš University Hospital, Latvia*

**Keywords.** Pituitary neuroendocrine tumours, somatostatin analogues, dopamine agonists, acromegaly, PRL, NFPA, cost-of-illness, national registry.

**Objectives.** Nowadays it is important for physicians to choose treatment that will be safe for patient as well as cost effective. The need for epidemiological, clinical and economical data prompted the creation of national registries which were designed to collect real-life clinical data for each patient, allowing us to analyze trends in comorbidities, mortality and medication costs for specific type of pituitary neuroendocrine tumours (PitNETs) in Latvia.

**Materials and Methods.** Information about patient characteristics was taken from a biobank participant survey of national biobank – Genome Database of Latvian population. These data were sorted according to diagnosis into 4 groups – GH secreting, PRL secreting, ACTH secreting and non-functional PitNETs. Pharmacological data about medication costs, the period of use and dosage was taken from the registry of prescriptions for state-reimbursed medicines. For further data analysis only lanreotide, octreotide, bromocriptine and cabergoline prescribed patients were selected.

**Results.** During this study, we identified 330 PitNET patients recruited to national biobank who had used specialized health care in the period from 2003 to 2018. The most common comorbidities were hypertension (64 %, n=205), spondylosis (70 %, n=225), nontoxic goiter (51 %, n=162) and type 2 diabetes mellitus (44 %, n=141). Somatostatin analogues received about 32 % (n=84) of the total number of patients, while 68% (n=175) of the study group received dopamine agonists. During the period from 2006 and 2018, the total cost of medications reached 7427886,82€, 6985730,72 € of which were acromegaly treatment.

**Conclusions.** The prevalence of comorbidities in PitNET patients was frequent. The average cost of acromegaly per patient was 53736,39 €. The highest mortality rate occurred in patients with non-functional PitNETs (14,74 %, n=14).

## ASSOCIATION BETWEEN REACTIVE ARTHRITIS AND UREAPLASMA AND MYCOPLASMA INFECTION

Author: *Elīna Skuja*<sup>1</sup>

Scientific research supervisors: Dr. med. *Anna Mihailova*<sup>1,2</sup>, Dr. *Ilze Skuja*<sup>1,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *ORTO Clinic, Latvia*

<sup>3</sup> *Ilze Skuja General Practitioner's practice, Latvia*

**Keywords.** Reactive arthritis, Ureaplasma, Mycoplasma.

**Objectives.** Reactive arthritis (ReA) is classified as spondyloarthropathy and defined as inflammatory arthritis following infectious trigger. Diagnosis includes clinical and microbiological criteria. Ureaplasma (U) and Mycoplasma (M) are proposed to be one of the ReA causative agents but results are inconclusive yet. Susceptibility to ReA is linked to HLA-B27. Aim was to investigate association between ReA and infection of Ureaplasma and Mycoplasma, also HLA-B27.

**Materials and Methods.** Study group consisting of women with ReA was constructed from all ORTO clinic arthritis patients who were tested for U and M infection. Data were obtained from medical history including demographic data, affected joints count (AJC) and laboratory data: CRP, HLA-B27 and U and M urine culture test results. Patients were divided into 2 groups according to the presence of bacteria. Data were analyzed using Microsoft Excel and IBM SPSS.

**Results.** From 1377 patients 870 had ReA of whom 590 were women. Mean age was  $40.8 \pm 12.0$ . Group 1(G1) included 191 patients of whom in 8 M, 47 U and 136 both U and M were present in urine samples, meaning that U/M infection is a causative agent for ReA in 32%. Group 2 (G2) included 399 patients with no presence of bacteria. G1 was statistically significantly ( $p < 0.05$ ) younger ( $40.0 \pm 12.6$ ) than G2 ( $45.2 \pm 13.4$ ). HLA-B27 was positive in 35%, without statistically significant differences between groups ( $p > 0.05$ ). Also no statistically significant difference in CRP levels between groups was found ( $p > 0.05$ ). From observations, the most common was oligoarthritis, followed by monoarthritis and polyarthritis with no statistically significant differences ( $p > 0.05$ ) between groups.

**Conclusions.** Ureaplasma and Mycoplasma should be searched for in younger patients. CRP is not an indicative marker to acknowledge presence of U or M infection. There are no differences in AJC based on the presence of bacteria. Study does not verify association between HLA-B27 and U/M infections in ReA.

## ACUTE PEPTIC ULCER BLEEDING IN PATIENTS WITH AND WITHOUT PRIOR NON-STEROIDAL ANTI-INFLAMMATORY DRUG THERAPY

Author: *Santa Štīle*<sup>1</sup>

Scientific research supervisor: Dr. *Zane Straume*<sup>1,2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga East Clinical University Hospital, Latvia*

**Keywords.** NSAID, peptic ulcer bleeding, acute gastrointestinal bleeding, Forrest classification.

**Objectives.** Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used medications associated with increased risk of peptic ulcer disease (PUD) and acute upper gastrointestinal bleeding (AUGIB). The aim of this study was to compare severity of AUGIB according to the Forrest classification in hospitalised patients with and without prior NSAID therapy.

**Materials and Methods.** Retrospective study of patients over 18 years of age admitted for AUGIB in Rīga East Clinical University Hospital during 2013 to 2014. Data were collected from medical records: age, gender, cause of upper gastrointestinal bleeding, history of NSAID use, Forrest classification and outcome. Data were analyzed using IBM SPSS 20.0.

**Results.** 236 patients were included: 98 (41.5%) female (mean age  $71 \pm 15.26$  years) and 138 (58.5%) male (mean age  $56 \pm 15.80$  years). The main AUGIB cause was bleeding PUD (n=180): FIA 6.4% (n=15), FIB 4.7% (n=11), FIIA 15.7% (n=37), FIIB 25% (n=59), FIIC 24.6% (n=58). 90 (38.1%) patients were NSAID users (mean age  $64 \pm 16.53$  years). The most commonly used NSAIDs were diclofenac, mostly causing FIIC 33.3% (n=8) and ibuprofen- FIIC 50% (n=4). NSAIDs use was associated with more frequent PUD bleeding ( $r=0.347$ ,  $p<0.001$ ). 108 patients (45.8%) were hospitalized in intensive care unit (ICU), most often with FIIB PUD bleeding- 36 (33.3%). Most of the patients requiring surgical intervention were on NSAID therapy (22/37,  $p=0.004$ ). The difference in length of hospital stay between NSAIDs users and non-users was marginally significant ( $p=0.058$ ). There was a statistically significant age difference between patients who recovered and those who died (n=212, ( $61 \pm 17.14$  years) vs. n=24, ( $78 \pm 10.04$  years),  $p<0.001$ ).

**Conclusions.** Prior NSAID therapy was associated with more frequent PUD bleeding and worse outcomes than patients without prior NSAID use. The most commonly used NSAIDs were diclofenac and ibuprofen, mostly causing stage FIIC.



## COMPARATIVE STUDY AMONG HbA1c, FASTING AND 2-HOUR POST PRANDIAL GLUCOSE IN TERMS OF DIAGNOSTIC AND SCREENING CRITERIA OF DIABETES

Authors: **Karan Sharma**<sup>1</sup>, **Parth Khandhedia**<sup>1</sup>

Scientific research supervisor: Dr. **Ramesh Pradhan**<sup>1</sup>

<sup>1</sup> Gujarat Cancer Society Medical College, India

**Keywords.** HbA1c, fasting plasma glucose, two-hour plasma glucose, correlation.

**Objectives.** Study aims to evaluate the efficacy and validity of using glycated hemoglobin (HbA1c) in diagnosis and screening of diabetes for early management compared to fasting plasma glucose (FPG) and 2-hour postprandial glucose (2hPG) and correlate to find out associations between them.

**Materials and Methods.** It is a retrospective study. Data was collected from available records of indoor patients in whom all three tests have been executed. Analyzed using SPSS.

**Results.** When diabetes is diagnosed with FPG, the sensitivity and specificity of HbA1c is 89.44% and 69.41% respectively, whereas with 2hPG it is 92.89% and 63.5%. When HbA1c is compared with FPG, the values of HbA1c are affected by the history of diastolic hypertension and family history of diabetics. Also, the same results were obtained when HbA1c was compared with 2hPG indicating the role of diastolic hypertension and family history of diabetes. However, when the values were applied to regression, it was found that the values have no significance in determining the value of HbA1c. The values of HbA1c correlated strongly positive with that of FPG as well as 2hPG and showed a linear relationship. The regression equation  $HbA1c (\%) = 3.737 + 0.027 \times FPG (mg/dL)$  explains 50.4% of variation and with less error when compared to  $HbA1c (\%) = 4.050 + 0.017 \times 2hPG (mg/dL)$ . Hence, the relationship of HbA1c with FPG is more linear and the values of FBG can be used to predict the approximate values of HbA1c through regression analysis.

**Conclusions.** HbA1c has greater potential as a diagnostic test due to its high sensitivity. The levels of HbA1c are affected by family history and the presence of diastolic hypertension. By the relationship of HbA1c with FPG, diagnosing criteria of diabetes should be  $HbA1c \geq 7.1\%$ .

## IMPACT OF ANAEMIA AND UREMIA ON COGNITION IN CHRONIC KIDNEY DISEASE

Author: **Madhumitha Srivelmurugan**<sup>1</sup>

Scientific research supervisor: Prof. **K. R. Senthilkumari**<sup>2</sup>

<sup>1</sup> *Government Villupuram Medical College, India*

<sup>2</sup> *Department of Physiology, Government Villupuram Medical College, India*

**Keywords.** Anaemia, urea level, chronic kidney failure, cognition, residual syndrome, chronic kidney failure, cognition, residual syndrome.

**Objectives.** To assess Cognitive function in CKD patient. To compare Cognitive function with anaemia and uremia. To compare Cognitive function with stage of CKD.

**Materials and Methods.** This cross sectional study was conducted in Government Villupuram Medical College and Hospital, After due ethical clearance and informed consent, 75 CKD patients between the age 18 and 60 were recruited in the study. Cognitive Function was assessed by MMSE, Picture word learning and Clock drawing Test. Hemoglobin and urea levels were evaluated using Autoanalyser. Statistical Analysis was done using SPSS version 20. p value of <0.05 is considered as significant.

**Results.** Cognitive Decline was found in all patients with Chronic Kidney Disease. Cognition showed positive correlation with Hb levels and urea level. Cognitive decline had an inverse relation to the stage of CKD.

**Conclusions.** Decrease in cognition is partly because of anaemia which will improve with treatment. Cognitive decline is also due to uremic solutes that cannot be removed completely by dialysis, which will lead to residual syndrome, in which retained solutes are poorly cleared. A better understanding of uremic solutes and their toxic effects would place dialysis on a more effective therapy.

## PERFORMANCE OF NON-INVASIVE TECHNIQUES IN DIAGNOSING STAGES OF LIVER FIBROSIS- A META-ANALYSIS

Authors: *Sharan Jhaveri*<sup>1</sup>, *Rudra Patel*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. Dr. *Jigar Patel*<sup>2</sup>

<sup>1</sup> *Smt. NHL Municipal Medical College, India*

<sup>2</sup> *Sardar Vallabhbhai Patel Institute of Medical Sciences and Research Multispeciality Hospital and Medical College, India*

**Keywords.** Transient elastography, liver fibrosis, AUROC, RCT.

**Objectives.** To review current evidence regarding performance of Transient Elastography and Acoustic Radiation Force Impulse and to compare the diagnostic accuracy of each method.

**Materials and Methods.** All language search was conducted on MEDLINE, COCHRANE, EMBASE and GOOGLE SCHOLAR databases from January to June 2020. Only studies with Area Under Receiver Operating Characteristic (AUROC) scores were included in this study. Weighted means for ROCs of TE and ARFI were measured to calculate individual diagnostic accuracies. Unpaired t- test. was applied to check for significant difference between them. p value <0.05 was considered significant. IBM SPSS 20 and Revman v5.3 were used for statistical calculation.

**Results.** A total of 65 studies (9788 patients) were included in the meta- analysis. 48 studies were used to assess TE accuracy, 6 for ARFI, and 11 were used to assess heterogeneity between the two. For TE, ROC scores for F<sub>2</sub>=0.827(95%CI 0.794-0.861), F<sub>3</sub>=0.873(95%CI 0.8469-0.9), F<sub>4</sub>=0.912(95%CI 0.899-0.924). For ARFI, ROC scores for F<sub>2</sub>=0.813() F<sub>3</sub>=0.875() and F<sub>4</sub>=0.89(). Using the aforementioned 11 studies, an unpaired t test was applied for comparison and the p values were calculated as follows: F<sub>2</sub> = 0.914, F<sub>3</sub>= 0.32 and F<sub>4</sub>=0.313. Sensitivity (SN) and Specificity (SP) for TE for stage F<sub>2</sub>-F<sub>4</sub> were also measured. SN: F<sub>2</sub>= 71.9%, F<sub>3</sub>=82.12% and F<sub>4</sub>=91.07%; SP: F<sub>2</sub>=82.86%, F<sub>3</sub>=86.21% and F<sub>4</sub>=87.99%.

**Conclusions.** Both TE and ARFI were considerably accurate in diagnosing liver fibrosis as inferred from their respective ROC scores. Both tests showed significantly elevated ROC scores for stage F<sub>4</sub> (liver cirrhosis). No significant difference was found amongst them as far as assessing and staging of liver fibrosis was concerned.

## THE EFFECT OF VITAMIN D ON THE COURSE OF RHEUMATOID ARTHRITIS

Author: *Alīna Agule*<sup>1</sup>

Scientific research supervisor: Dr. *Anda Kadiša*<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

<sup>3</sup> *Rīga East Clinical University Hospital Clinic, Latvia*

**Keywords.** Rheumatoid arthritis, vitamin D, anti-CCP, RF, DAS28.

**Objectives.** Vitamin D deficiency has been implicated in pathogenesis of many autoimmune diseases, including rheumatoid arthritis (RA). It has been found to be associated with development of the disease, however, the evidence from epidemiological studies concerning the relationship between serum vitamin D concentrations and RA is inconsistent. This study aims to evaluate vitamin D impact on RA course and does RA treatment affect vitamin D level.

**Materials and Methods.** 80 RA patients were included and tested on RF, antiCCP, CRP and serum vitamin D level. Patients completed a questionnaire on the course of the disease and received treatment. Disease activity score 28 (DAS28) was calculated.

**Results.** Vitamin D level was insufficient in 40% of patients. 77.5% of RA patients were taking vitamin D supplements. The absence of supplementation of vitamin D was related to higher prevalence of vitamin D deficiency ( $p=0.001$ ). Levels of vitamin D had negative correlation to swollen joint count ( $r=-0.096$ ,  $p=0.39$ ) and VAS score ( $r=-0.119$ ,  $p=0.29$ ). There was no correlation between vitamin D level and DAS28 ( $r=+0.035$ ,  $p=0.759$ ). The duration of vitamin D supplementation had negative correlation to CRP level ( $r=-0.105$ ,  $p=0.418$ ). All patients who did not report current joint pain were taking vitamin D supplements ( $p=0.05$ ). Vitamin D insufficiency was associated with higher CRP ( $p=0.347$ ), RF ( $p=0.728$ ) and antiCCP ( $p=0.604$ ) levels. The prevalence of vitamin D insufficiency was higher in those receiving NSAIDs (52%,  $p=0.229$ ), glucocorticoids (52.4%,  $p=0.394$ ) and adalimumab (47.1%,  $p=0.370$ ) than other therapies. There was no association between vitamin D and stage of RA, as well as RA extra-articular manifestations.

**Conclusions.** The study data suggest that vitamin D level may affect RA activity and aggressiveness. Most medications used to treat RA do not significantly affect vitamin D depletion.

## PHOSPHORUS SERUM LEVEL: 15 YEARS STUDY RESULTS ONE LABORATORY DATABASE FROM LATVIA

Author: *Diāna Pokšāne*<sup>1</sup>

Scientific research supervisor: Dr. *Ingvars Rasa*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Hypophosphatemia, phosphorus.

**Objectives.** To evaluate over the past 15 yrs phosphorus serum level status among adults in Latvia from E.Gulbja laboratorija electronic database. Hypophosphatemia may be the reason for X-linked hypophosphatemia (XHL) which is an inherited disorder characterized by low levels of phosphorus in the blood.

**Materials and Methods.** The data from 803 patients admitted to the study were analyzed retrospectively in time January 2004 – December 2020. All hypophosphatemia levels (the reference range: 0.80 – 1.60 mmol/L) was divided into 3 groups in depends on serum phosphorus leve 1– mild (0.81 – 0.65 mmol/L), moderate (0.65 – 0.32 mmol/L) and severe (<0.32 mmol/L). Also, serum calcium (Ca), vitamin D and iPTH were analyzed. The reference range for serum Ca: 2.1 – 2.6 mmol/L, vitamin D 30 – 100 ng/mL, iPTH 12 – 72 pg/mL.

**Results.** A total of 3173 serum phosphorus level samples were analyzed – 1760 females, 1413 males; average age 60.2±14.9 SD; the average age of females – 60.4±15.0 SD and males – 60.0±14.8 SD. The number of blood samples with reduced serum phosphorus level was 1803 (56.8%) where mild was 1414(78.4%) 767 females, 647 males; average age 60.0±14.7 SD; the average age of females – 60.2±14.4 SD; the average age of males–59.7±15.0 SD; moderate were 381(21.1%) 206 females, 175 males; the average age was 56.6±15.7 SD; the average age of females – 54.1±17.5 SD; the average age of males–59.5±12.8 SD and severe were 8 (0.5%) – 5 females, 3 males; the average age was 56.1±16.4 SD; the average age of females – 53.0±19.4 SD; the average age of males – 61.3±11.0 SD. A total of 1719 (95.3%) serum Ca levels were analyzed, a total of 972 (53.9%) iPTH levels and a total of 456 (25.3%) vitamin D levels were analyzed also.

**Conclusions.** Reduced serum phosphorus level is more often than commonly believed and it needs to be examined for various reasons, e. g., hyperparathyroidism, vitamin D deficiency, XLH.

## INFLUENCE OF METABOLIC INFLAMMATORY MARKERS ON THE FORMATION OF DIABETIC CARDIOMYOPATHY IN OBESITY PATIENTS

Author: *Mayur Jabwani*<sup>1</sup>

Scientific research supervisor: Prof. *Zhuravlyova Larysa Volodymirovna*<sup>2</sup>

<sup>1</sup>*Kharkiv National Medical University, Ukraine*

<sup>2</sup>*Kharkiv National Medical University, Department of Internal medicine and Endocrinology, Ukraine*

**Keywords.** Interleukin-1 $\beta$  (IL-1 $\beta$ ).

**Objectives.** To determine the relationship between leptin and IL-1 $\beta$  on the formation of diabetic cardiomyopathy in patients with DM-2.

**Materials and Methods.** Our work is part of the study of Department of Internal Medicine №3 and endocrinology of Kharkiv National Medical University "Diabetes mellitus and comorbid pathology". The analysis of the data of the survey of 82 patients with SD-2 with a body mass index of less than 29.9 kg/m<sup>2</sup> with diabetes of 1 to 9 years of moderate severity was carried out. The control group consisted of 20 relatively healthy individuals who were comparable in age and gender. The levels of leptin and IL-1 $\beta$  were determined by the enzyme immunoassay. As markers of diabetic cardiomyopathy, the determination of echocardiographic (EchoCG) parameters was adopted. For this purpose, the maximum peak of diastolic filling during rapid filling of the left ventricle E, the maximum peak of diastolic filling of the left ventricle during systole of the left atrium A, and their relationship E/A, were determined.

**Results.** Comparing the level of leptin (ng/ml) in the control group and the group of patients, it was found that this level was significantly different - it was respectively  $7.59 \pm 0.35$  and  $12.72 \pm 0.65$  ( $p \leq 0.05$ ). The level of IL-1 $\beta$  (pg/ml) was  $10.59 \pm 0.27$  in the group of patients and  $8.12 \pm 0.24$  ( $p \leq 0.05$ ) in the control group, and differed significantly in the groups. When comparing EchoCG data, the E/A values in the two groups were significantly different: the E/A level in the control group was  $1.4 \pm 0.075$ , and in the patient group -  $0.94 \pm 0.03$  ( $p \leq 0.05$ ), which confirms the presence of cardiomyopathy. Correlation analysis between leptin and IL-1 $\beta$  revealed a relationship in the patient group ( $R = 0.580$  ( $p \leq 0.05$ )), whereas no correlations was found in the control group.

**Conclusions.** We believe that in patients with diabetes mellitus 2 and obesity, proinflammatory agents such as the proinflammatory IL-1 $\beta$ , as well as leptin, which has a multifaceted effect on the body and appear to have pro-inflammatory properties, make a significant contribution to the development of cardiac pathology, in particular, diabetic cardiomyopathy.

## CHANGE OF DIET HABITS IN INFLAMMATORY BOWEL DISEASE PATIENTS AFTER DIAGNOSIS – A PROSPECTIVE STUDY

Author: *Natālija Prohorova*<sup>1</sup>

Scientific research supervisor: Dr. *Poļina Zaļizko*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Diet, inflammatory bowel disease.

**Objectives.** A number of diets have shown to be efficacious in an attempt to manage inflammatory bowel disease (IBD), however, the precise components are not clear or often contradict one another therefore health professionals struggle to provide evidence-based nutrition guidance. The aim of the study was to assess change of diet habits after IBD diagnosis and to identify products which patients believe to have impact on the course of disease.

**Materials and Methods.** Prospective study included 36 IBD patients (19 males, mean age 40 years (SD=15.5, range (19 – 72)) from January – October 2020 at Pauls Stradiņš Clinical University Hospital. Inclusion criteria: histologically approved diagnosis of IBD and signed informed consent. Patients were interviewed and data from medical records was collected. The data was analysed using IBM SPSS Statistics.

**Results.** 66.7%(n=24) patients claimed that they try to eat more healthy since the onset of diagnosis. 58.3%(n =21) of patients excluded some products after IBD diagnosis and the most common were milk products 47.6%, fast food 47.6%, spicy foods 42.9%, sweets 38.1%. 61%(n=22) changed their diet habits and decreased sugar 59% and fat intake 50%, decreased alcohol consumption 45.5%, increased vegetable and fruit intake, each 36.4%. There was no statistically significant difference between Crohn's disease and ulcerative colitis patients. The most common products that improved IBD symptoms were vegetables 41.7%, fermented milk products 41.7%, fruits 33.3%. 66.7% responded that there are products that worsen their IBD symptoms. The most common included spicy foods 50% milk 37.5%, smoked foods 37.5%, fried food 33.3%, sweets 33.3%.

**Conclusions.** This study suggests that after diagnosis of IBD most patients change their diet habits to be more healthy. Exclusion diets are popular among IBD patients and there seem to be products that may worsen IBD symptoms in particular group of patients.

## IMPACT OF STAPHYLOCOCCUS SPECIES BIOFILM FORMATION IN PERITONEAL DIALYSIS ASSOCIATED PERITONITIS

Author: *Jānis Seilis*<sup>1</sup>

Scientific research supervisor: Dr. *Kārlis Rācenis*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Peritoneal dialysis, Staphylococcus infection, biofilm production.

**Objectives.** Peritoneal dialysis (PD) is a common method of renal replacement therapy. Infection as PD associated peritonitis is a major complication and cause of dialysis failure and is one of the leading causes of mortality. Frequently Staphylococcus species are the cause of PD associated peritonitis. These bacteria have a wide profile of virulence and strong ability of biofilm formation, it is a significant barrier which lowers the penetration of antibacterial substances and prevents bacteria against the host immune system.

**Materials and Methods.** The aim of the study was to determine biofilm formation ability of Staphylococcus species isolated from PD patients with the peritonitis. In total 11 Staphylococcus species were obtained from PD patients with PD associated infections at Pauls Stradiņš Clinical University Hospital. Bacterial identification was performed with MALDI-TOF or VITEK-2 system. Antimicrobial susceptibility was performed according to EUCAST V11 standard. Biofilm growth was detected using microtiter plate assay. Afterwards, the optical density (OD) of bacterial biomass was measured with a microplate spectrophotometer (TECAN INFINITE F50) at 570 nm wavelength. Data were analysed using Microsoft Excel 10.

**Results.** Bacterial strains were isolated from 9 peritoneal dialysis patients (4 dialysate, 7 smears from peritoneal dialysis catheter exit-site). Relevant biofilm production was observed among 8 isolated strains. Most commonly, strains produced moderate biofilm (6; 55%), strong (2; 18%) and non or weak (3; 27%). Five isolated strains showed resistance to penicillin G, one strain was resistant to ampicillin. One of *S. aureus* strains was methicillin resistant and produced strong biofilm.

**Conclusions.** Biofilm formation was detected commonly in isolated bacterial strains and plays an important role in the development of peritonitis. Antibacterial resistance and biofilm formation is an important factor of peritonitis treatment and overall prognosis.



## THE OSTEOPOROSIS IN MEN: EXPERIENCE OF THERAPY WITH DENOSUMAB (OSTEOPROM). FIRST RESULTS

Authors: *Diāna Pokšāne*<sup>1</sup>, *Marta Dubovska*<sup>1</sup>  
Scientific research supervisor: Dr. *Ingvars Rasa*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Denosumab, osteoporosis, osteoporosis in men, osteoporosis treatment.

**Objectives.** Osteoporosis (OP) is an important and underlooked problem in men. The lifetime risk of hip fracture is lower in men than in women. Men are twice as likely to die after hip fractures. Aim of this study was to observe the effectiveness of Denosumab (Dmab) in the treatment of OP in men. We analyzed different aspects in a real-world clinical setting using single-centre experience.

**Materials and Methods.** We carried out an investigation from August 2014 for 72 months. The effectiveness of Dmab was analyzed using total mean hip and spine BMD changes during treatment Dmab and fracture incidence. Lumbar spine and the hip were analyzed by DXA (also QCT) scans at the time of initial diagnosis and till of study end. Labdata, risk factors, comorbidities, concomitant medications, Ca, iPTH, vitamin D was evaluated in the beginning and the end.

**Results.** We analyzed 34 men, an average age  $62.7 \pm 10.2$ SD. Spin, hip BMD analyzed with DXA in 32 pts (94.1%), with QCT in 2 pts (5.9%). The diagnosis was: idiopathic OP (61.8%), GCIO (32.4%), secondary OP (5.9%). Of all men who were considered, after Dmab injections, BMD increased – 71.4% at the lumbar spine, by 69.2% at the total mean hip. We analyzed risk factors – the main were GCs use, smoking and BMI. 97.1% of men were with at least 1 comorbidity, all pts – using  $\geq 1$  concomitant medication. Ca did not change significantly. Normal range of iPTH in the beginning was 87.9%; in the end was 78.8%. At the beginning vitamin D deficiency was 2.9%, insufficiency was 23.5% and optimal level was 73.5%.

**Conclusions.** We researched Dmab real-world data from a single-centre in Latvia for the first time. Dmab can be used as the first-line medication and also, Dmab increases BMD after different bisphosphonates medications and therapy durations.

# NEUROLOGY, PSYCHIATRY, PSYCHOTHERAPY, PSYCHOSOMATICS

## COMPARISON OF QUALITY OF LIFE IN PATIENTS WITH SCHIZOPHRENIA AND DEPRESSION IN RĪGA'S PSYCHIATRY AND NARCOLOGY CENTRE'S OUTPATIENT DEPARTMENT

Author: *Paula Jurge*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Jelena Vrublevska*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Psychiatry and Narcology Centre, Latvia*

**Keywords.** Schizophrenia, depression, quality of life.

**Objectives.** The aim of this study was to compare quality of life (QoL) in outpatients aged from 18 - 65 with schizophrenia (F20, ICD-10) and depression (F32, F33, ICD-10) and to determine whether employment status has an impact on patient's QoL.

**Materials and Methods.** A cross-sectional survey was conducted during August, 2020 until December, 2020. Patients with schizophrenia and depression were selected by certified psychiatrists in Rīga's Psychiatry and Narcology Centre's outpatient department. Outpatients were later interviewed and completed 36-Item Short Form Survey (RAND-36), Sociodemographic variables questionnaire, and structured interview after routine psychiatric control. Exclusion criteria in both groups were severe symptoms for patients with schizophrenia it was 4 points in any APA DSM - V questionnaire domains, while in outpatients with depression >20 points on PHQ -9. Statistical analysis (Shapiro - Wilk's, Mann - Whitney U, the Fisher tests) was performed using IBM SPSS.

**Results.** Based on the inclusion and exclusion criteria, 70 patients (35 with depression and 35 with schizophrenia) were enrolled in the study. Patients with schizophrenia reported lower QoL in all sections compared to patients with depression ( $p < 0.001$ ). Patients with depression who are unemployed reported lower QoL, especially in the section "general health" compared to patients with depression in all groups ( $p < 0.05$ ). There were no statistically significant correlations amidst employment status and QoL in patients with schizophrenia ( $p=0.18$ ). It was found that patients with depression are employed and married more often than patients with schizophrenia ( $p < 0.001$ ), which may contribute to higher QoL. No correlation between duration of disease and QoL was found.

**Conclusion.** Results show that marital and employment status in patients with schizophrenia may contribute to lower QoL than in those with depression. The study should be investigated further to include a larger study group and explore other factors causing lower QoL.

## DETERMINING THE OPTIMAL DURATION OF LONG-TERM EEG WITH VIDEO RECORDING

Author: *Emilija Kavaliauskaitė*<sup>1</sup>

Scientific research supervisor: Prof. *Rūta Mameniškienė*<sup>1</sup>

<sup>1</sup> *University of Vilnius, Lithuania*

**Keywords.** Epilepsy, electroencephalography, duration, seizure.

**Objectives.** Electroencephalography (EEG) is an essential non-invasive test of cerebral bioelectrical activity in the diagnosis of epilepsy. The optimal duration of long-term EEG recording is not defined and can range from several hours to 3 weeks. The results of the examination may be skewed by premature termination of the recording and failure to detect significant epileptiform activity, and prolonged test continuity is not clinically relevant, causes inconvenience to the patient, increases hospitalization time and increases the time a physician reviews a single study. The aim of the study is to determine the optimal duration of long-term EEG with video recording.

**Materials and Methods.** In this retrospective study, 98 long-term EEGs with video recording were evaluated. The duration of each examination, the time of onset of first epileptiform discharges and the time of onset of first seizure was recorded during the evaluation. Statistical data analysis was performed using MS Excel and IBM SPSS Statistics 24.0. A statistically significant correlation was considered when the p value <0,05.

**Results.** Pathological bioelectrical activity was detected in 74,5% of 98 patients. Average long-term EEG duration was 23 hours and 6 minutes. Average time until first epileptiform discharge was 2 hours and 11 minutes. 49,3% of epileptiform activity was recorded within first hour and 95,9% patients had epileptiform activity within 7 hours. Only 4,1% of epileptiform activity was recorded after 7 hours. Average time until first epileptic seizure was 11 hours and 54 minutes. Half of seizures were recorded within first 12 hours and 93,75% of seizures were recorded within the first 24 hours. Only one seizure was recorded after 24 h.

**Conclusion.** The greatest probability of capturing epileptiform activity is within the first 7 hours. Majority of epileptic seizures were recorded within 24 hours of the examination. The study suggests that continuing EEG longer than 24 hours may not be very beneficial unless it is necessary to record the seizure or there are insufficient findings to make an accurate diagnosis.

## EPILEPTIC ENCEPHALOPATHY WITH CSWS: CLINICALLY HETEROGENEOUS AND UNDER INVESTIGATED IN LATVIAN CHILDREN

Author: *Aija Štrausa*<sup>1</sup>

Scientific research supervisors: Dr. *Jurgis Strautmanis*<sup>1,2</sup>, Dr. *Marta Celmiņa*<sup>1,2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

<sup>3</sup> *Epilepsy and Sleep Medicine Center, Latvia*

**Keywords.** Epileptic encephalopathy, spike-wave index.

**Objectives.** Epileptic encephalopathy with continuous spike and wave during sleep (CSWS) is mainly associated with progressive decline in cognitive and/or behavioural functions after the seizure onset. The aim of the study was to analyze characteristics of CSWS in Latvian patients.

**Materials and Methods.** A cross-sectional retrospective study of medical records of CSWS patients in Children's Clinical University Hospital from 2017 to 2020. Data was analysed using IBM SPSS Statistics 22.

**Results.** Final sample consisted of medical records of 78 patients (35,9% female). Average age was 7,9 years (SD 2,14; min 4,0; max 12,04). Clinical presentations were as follows: delay in language development (55,1%), behavioral disorders (37,2%), learning disabilities (25,6%), intellectual disability (23,1%), childhood autism (15,4%), and mixed developmental disorder (10,3%). Clinically, seizures were detected in 88,5% of cases. Magnetic resonance imaging (MRI) was done only in 71,8% of cases with positive findings in 32,1% of investigations. Most patients received specific treatment (85,8%) - 52,5% had tried one, 32,1% had used two and more medications. As an indicator of therapeutical success, spike-wave index (SWI) in two consequent electroencephalograms (EEG) was available for 69,2% of patients. SWI increased in 12,8%, remained unchanged in 50,0% and decreased in 6,4% of cases. No statistically significant differences between clinical presentation, results of investigations (EEG, MRI) and therapeutical outcome were found.

**Conclusion.** Clinical presentation of CSWS is heterogeneous, including severe disability. Diagnostic approach is in need of improvement based on insufficient amount of performed investigations (MRI, repeated EEG). The small proportion of patients with positive EEG dynamics show the necessity for improvements in therapeutic approach.

## DIFFERENT FACES OF GENDER IDENTITY DISORDER

Author: *Lelde Gaspersone*<sup>1</sup>

Scientific research supervisor: Dr. *Nikita Bezborodovs*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Child/adolescent psychiatry, gender identity disorder.

**Objectives.** Transgender/gender nonconforming youth struggle with a perpetual conflict between their affirmed and assigned gender causing extensive emotional strain and exposure to negative mental health outcomes. Consequently, alongside gender identity disorder (GID) treatment tactics, attention to coexisting mental disorders is imperative. Limited data exists analysing GID patient care in Latvia, thus the aim was to assess the experience of diagnosing GID patients, their comorbidities and presenting characteristics.

**Materials and Methods.** All cases of child and adolescent patients diagnosed with gender identity/other sexual disorders (ICD-10, F64, F66) from 2015-2020 were investigated. Patient information was gathered from Children's Clinical University Hospital's medical records.

**Results.** 28 patients were analysed. Mean age of GID related symptom onset was 4.83 years (SD=1.53), of related dysphoria - 11.40 years (SD=1.40). The initial contact with psychiatric care occurred at 14.46 years of age (SD=1.20) where 75%(N=21) presented with psychiatric concerns other than GID, commonly, suicidal ideation or attempt (N=11) and anxiety (N=7). 60.71%(N=17) received psychopharmacological treatment regarding the concern. 85.71%(N=24) patients were diagnosed with at least one comorbidity - neurotic, stress-related disorders (N=13), mood disorders (N=8), behavioural/emotional disorders (N=7), eating disorders (N=3), disorders of psychological development (N=3), disorders of personality and behaviour (N=1). Ample range of complaints have been described - from gender envy to severe repulsion against their own anatomy. Commonly, even before encountering psychiatric care specialists, patients attempt to change their gender expression by modifying appearance, using chest binders and wearing oversized clothing to hide gender-specific characteristics

**Conclusion.** Patients rarely present with GID as the primary concern; majority has at least one concomitant psychiatric disorder, predominantly, neurotic and affective disorders. Disturbingly high number of patients have expressed suicidal ideation or attempted suicide. Patients experience years of dysphoria and gender expression change before encountering psychiatric care. Efforts should be made to improve GID patient management and reduce the risk of adverse outcomes.

## THE COMPARE OF POSTSTROKE APHASIA OUTCOME IN MONOLINGUAL AND BILINGUAL PATIENTS

Authors: *Alise Baborikina*<sup>1</sup>, *Olga Holodova*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Evija Miglāne*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** stroke, aphasia, monolingual, bilingual.

**Objectives.** Aphasia is a condition, affecting the ability to comprehend or product the language. The most common cause of aphasia is stroke. It is considered that bilingual patients may have better outcome results due to neuroplasticity. The aim of the study was to explore the association between bilingualism and outcome in monolingual and bilingual patient groups with poststroke aphasia.

**Materials and Methods.** The prospective cohort study enrolled 166 patients with poststroke aphasia between October 2019 and January 2021. Patients were divided into two groups: monolinguals and bilinguals. All The severity of aphasia was rated based on NIHSS language item (0 points – normal speech, 1 – Mild-to-moderate aphasia, 2 points – severe aphasia, 3 points – total aphasia) on admission, at the discharge and after 3 months. 3-month follow-up was conducted by telephone interview.

**Results.** 82 monolingual patients (median age 74 years) and 84 bilingual patients (median age 77 years) were admitted to Pauls Stradiņš Clinical University Hospital with stroke and speech deficit. 24.1% of monolingual patients died during hospitalization period and 24.6% before 3-months follow-up, 21.7% and 19.0% respectively in the second group. Global aphasia was most common type of aphasia in both groups – 67.5% and 61.9% accordingly. Mean severity of aphasia on the admission was similar between groups,  $2.23 \pm 0.89$  in monolingual and  $2.16 \pm 0.88$  in bilingual group ( $p=0.78$ ), as well as at discharge,  $1.06 \pm 0.90$  and  $1.15 \pm 1.02$  ( $p=0.68$ ) respectively. After 3 months severity of aphasia differed significantly, being equal to  $0.73 \pm 0.72$  in monolingual and to  $0.53 \pm 0.74$  in bilingual group ( $p=0.04$ ).

**Conclusion.** Global aphasia was the most common type of aphasia during the admission. No statistically significant difference of the severity of aphasia was found between two groups on admission and at the discharge. Bilingual patients had less severe aphasia comparing to monolingual patients after 3 months.

## THE INCIDENCE AND CORRELATION BETWEEN ANXIETY, DEPRESSION SYMPTOMS AND MATERNAL BURNOUT IN MOTHERS AMONG LATVIA

Author: *Ilze Madara Brūvere*<sup>1</sup>

Scientific research supervisor: Dr. *Lelde Logina*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Anxiety, depression, burnout syndrome.

**Objectives.** Maternal burnout is a three-dimensional syndrome characterized by overwhelming exhaustion, the tendency to distance one's children, and a sense of ineffectiveness. Other researches have shown that although burnout has been linked to anxiety and depression symptoms, the relationship between these symptoms and burnout is not established.

**Materials and Methods.** In this correlational study, mothers with a child up to 7 years of age were asked to fill self-report questionnaire electronically and voluntarily. The questionnaire consisted of an internationally validated General Anxiety Disorder-7 Scale, Patient Health Questionnaire-9. Maternal burnout was evaluated by Parental Burnout Inventory, translated in Latvian. The obtained data were analyzed in IBM SPSS Statistics 26.0.

**Results.** 554 mothers attended the study - age median 30 years IQR (28-33), from which 68 (12%) presented with severe anxiety and 116 (21%) moderate anxiety symptoms. Of 554 mothers, 61 (11%) presented with severe depression, 81 (15%) with moderately severe depression, 155 (28%) with moderate depression symptoms. PBI median in mothers with children <1 year of age n=138 was 24 IQR (14-41,25), in mothers with children ≥1 but ≤7 years of age n=268 was 34 IQR(19-58,75), in mothers with children >7 years of age n=4 was 40,5 IQR (4,5-69,75). PBI median in mothers with one child n=328 was 28 IQR(16-48,75), with two children n=180 PBI median was 41 IQR (25-60). Statistically significant correlations were found between anxiety symptoms and maternal burnout  $R_s=0,665$ ,  $p<0,001$  and between depression symptoms and maternal burnout  $R_s=0,646$ ,  $p<0,001$ .

**Conclusion.** The study shows that 33% presented with moderate to severe anxiety symptoms and 54% with moderate to severe depression symptoms. These results positively and significantly correlated with maternal burnout. Anxiety, depression symptoms, and maternal burnout increase with children's age and the number of children.

## THE INCIDENCE OF ANXIETY AND DEPRESSION SYMPTOMS, SELF-ESTEEM LEVEL AND THEIR CORRELATION WITH BURNOUT SYNDROME IN MOTHERS WITH CHRONICALLY SICK CHILDREN

Author: *Ilze Madara Brūvere*<sup>1</sup>

Scientific research supervisor: Dr. *Lelde Logina*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Anxiety, depression, burnout syndrome, chronic illness.

**Objectives.** Often mothers with children with chronic illnesses tend to deal with more stress, which may lead to higher anxiety and depression symptom levels. The aim was to examine correlations between parental burnout and anxiety, depression symptoms, and level of self-esteem in mothers of children with chronic illness.

**Materials and Methods.** This correlational study participated mothers with at least one child up to 7 years of age who have a chronic illness. Mothers participated voluntarily by filling self-report questionnaire electronically that consisted of an internationally validated General Anxiety Disorder-7 Scale, Patient Health Questionnaire-9, Rosenberg's self-esteem scale, and Parental Burnout Inventory. The obtained data were analyzed in IBM SPSS Statistics 26.0.

**Results.** 24 mothers attended the study - age median 31 years IQR (30-34) and the median number of children 2 IQR(1-3). Of 24 mothers, 3 (13%) presented with severe anxiety symptoms, 7 (29%) with moderate anxiety, and 8(33%) with mild anxiety symptoms. 4(17%) presented with severe depression symptoms, 3(13%) with moderately severe depression symptoms, 7(29%) with moderate depression symptoms, and 6(25%) with mild depression symptoms. Self-esteem median 26, IQR(24-33,5). Parental burnout median 34 IQR (23-54). A statistically significant, positive, and very strong correlation was found between anxiety symptoms and maternal burnout  $R_s=0,822$ ,  $p<0,001$  and a statistically significant, positive, strong correlation between depression symptoms and maternal burnout  $R_s=0,781$ ,  $p<0,001$ . Also statistically significant, a negative and strong correlation between lower self-esteem and parental burnout  $R_s=-0,601$ ,  $p=0,002$ . A statistically significant, negative, and strong correlation between lower self-esteem and depression symptoms was found  $R_s=-0,709$ ,  $p<0,001$ .

**Conclusions.** Of all 24 mothers with at least one child with chronic illness, 42 % presented with moderate to severe anxiety symptoms, and 67% showed moderate to severe depression symptoms. Mothers with chronically ill children have lower self-esteem, which leads to more severe depression symptoms and maternal burnout.



## INPATIENT TREATMENT AND REHABILITATION OF CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDERS (ASD) IN LATVIA: 5 YEAR TIME TRENDS

Author: *Zane Semjonova*<sup>1</sup>

Scientific research supervisor: Dr. *Nikita Bezborodovs*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Autism spectrum disorder.

**Objectives.** The goal of treatment and rehabilitation of ASD is to increase functional independence and quality of life through learning and development, improved communication, and social skills. There are currently no effective pharmacological treatments for core symptoms of ASD. The aim of this study was to investigate the trends in pharmacological treatment and psychosocial rehabilitation in children and adolescents with ASD in Latvia.

**Materials and Methods.** A retrospective study based on analysis of medical records of patients with a diagnosis of ASD (F84\*, ICD-10) who received inpatient psychiatric care in Children's Clinical University Hospital in the period from January 2015 to December 2019. The period of study was subdivided into two time periods (1st period - January 2015 to June 2017, and 2nd period - July 2017 to December 2019), to evaluate the time trends.

**Results.** The study included 316 admissions of which 80% of patients were boys. 1st period had 121 admissions, 2nd period - 195. Mean patient age in 1st period was 7,21 (SD=3,8) and 6,14 (SD=4,1) in 2nd period ( $p=0,02$ ). The mean duration of hospital stay in both periods was similar 6,69 (SD=5,4) and 6,81 (SD=4,0) respectively ( $p=0,82$ ). There were significantly more first-time admissions in the 2nd period - 61 (50,4%) to 153 (78,5%) respectively ( $p=0,00$ ). There was a significant decrease in the use of pharmacological therapy in the 2nd period from 55 (45,5%) to 45 (23,1%) cases respectively ( $p=0,00$ ), and a significant increase in the use of psychosocial rehabilitation from 99 (81,8%) to 183 (93,8%) cases ( $p=0,00$ ).

**Conclusion.** Inpatient pharmacotherapy use in patients with ASD has decreased over a 5-year period, but the use of various rehabilitation methods in the treatment of ASD in Latvia is increasing, signaling a gradual move towards more evidence-based treatment and rehabilitation practice.

## THE KNOWN BURDEN OF HUNTINGTON DISEASE IN NORTHERN SCOTLAND: PREVALENCE OF MANIFEST AND PRE-SYMPTOMATIC GENE CARRIERS IN THE MOLECULAR ERA

Authors: *Georgios Kounidas*<sup>1</sup>, *Heather Cruickshank*<sup>2</sup>,  
*Stavroula Kastora*<sup>2</sup>, *Stella Sihlabela*<sup>1</sup>

Scientific research supervisor: Prof. *Zosia Miedzybrodzka*<sup>2</sup>

<sup>1</sup> *Aberdeen Royal Infirmary, United Kingdom*

<sup>2</sup> *University of Aberdeen, United Kingdom*

**Keywords.** Prevalence, Huntington Disease, Scotland, General Practice.

**Objectives.** Huntington disease prevalence was first estimated in Grampian, Northern Scotland in 1984. Molecular testing has since increased ascertainment. The aim was to estimate the prevalence of manifest Huntington disease and tested pre-symptomatic gene carriers in Northern Scotland, and estimate the magnitude of biases in prevalence studies that rely upon routine coding in primary care records.

**Materials and Methods.** A retrospective study based on analysis of medical records of patients with a diagnosis of ASD (F84\*, ICD-10) who received inpatient psychiatric care in Children's Clinical University Hospital in the period from January 2015 to December 2019. The period of study was subdivided into two time periods (1st period - January 2015 to June 2017, and 2nd period - July 2017 to December 2019), to evaluate the time trends.

**Results.** The prevalence of manifest Huntington disease in Northern Scotland in 2020 was 14.6 (95% CI 14.3-15.3) per 100,000, and of pre-symptomatic gene carriers was 8.3 (95% CI 7.8-9.2) per 100,000. Whilst the population in Northern Scotland decreased by 0.05% between 2016 and 2020, the number of manifest and tested pre-symptomatic gene carriers increased by 7.4% and 23.3% respectively. Manifest disease in Grampian increased by 45.9% between 1984 and 2020. More women than men had a diagnosis. General Practice coding underestimated symptomatic molecularly confirmed prevalence by 2.2 per 100,000 people

**Conclusion.** Even in an area with previously high ascertainment, there has been a 45.9% increase in manifest Huntington disease over the last 30 years. Within our catchment area, prevalence varies between health board regions with similar community-based services. Such variation in prevalence could have major drug cost and service delivery implications, if expensive, complexly-administered therapies prove successful. Health services should gather accurate population-based data on a regional basis to inform service planning.

## COMPARISON OF HEALTH AND SOCIAL ANXIETY SCORE AMONG STUDENTS OF STUDY PROGRAMMES MEDICINE AND HEALTH SPORT SPECIALIST

Authors: *Marija Pērkone*<sup>1</sup>, *Jūlija Janceva*<sup>1</sup>, *Vineta Biriņa*<sup>1</sup>

Scientific research supervisor: Dr. *Lelde Logina*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Health anxiety, social anxiety, physical activity, medical students.

**Objectives.** Physical activity enhances thinking, learning and reduces risk of anxiety (WHO, 2020). Given the specifics of medical student educational process, they may have less time to do physical activities and might be at higher risk of developing an anxiety disorder compared to, for example, students of the study programme Health Sport Specialists. The aim of this research is to compare health and social anxiety scores of medical students (MS) and health sport specialist students (HSSS).

**Materials and Methods.** Sociodemographic questionnaire, including questions about physical activity and mental health factors, Social Phobia Inventory (SPIN) and Health Anxiety Inventory (HAI, short version). Data was analysed using Microsoft Excel and IBM SPSS Statistics 20.

**Results.** Altogether 139 students responded (of which 58 HSSS and 81 MS), aged 18-54 (median 22), gender distribution: 24,5% men and 75,5% women. Average physical activity per week in hours was found to be lower among MS (median 2,5, IQR=1-5,75) than HSSS (median 6, IQR=5-8). A statistically significant difference was found in SPIN score between the groups using Mann-Whitney U test ( $U=968,5$ ,  $p<0.001$ ), where MS median was 25 (IQR=16-31,5) and HSSS median 12 (IQR=8-18). A statistically significant difference was observed in HAI score between MS (median 16, IQR=12,5-20) and HSSS (median 11, IQR=7,75-17) using Mann-Whitney U test ( $U=1358,5$ ,  $p<0.001$ ). In addition, the results showed statistically significant weak negative correlations between (1) HAI score and physical activity (*Spearman's rho* = -0.342,  $p<0.001$ ), and (2) SPIN score and physical activity (*Spearman's rho* = -0.313,  $p<0.001$ ).

**Conclusion.** The study concludes that there are significantly higher health and social anxiety scores among medical students compared to health sport specialist students which might be related to the observed lower level of physical activity on average among the medical students.

## DEPRESSION AMONG PATIENTS WITH ACUTE AND CHRONIC PANCREATITIS

Author: *Anžejš Dmuhovskis*<sup>1</sup>

Scientific research supervisor: Dr. *Elmārs Tērauds*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Psychiatry and Narcology Centre ambulatory centre "Pārdaugava", Latvia*

**Keywords.** Pancreatitis, Depression, Risk factors, PHQ-9, AUDIT.

**Objectives.** Depression is a common mental disorder. Pancreas diseases are also common in Latvia. Several studies have provided data that chronic pancreatitis is related to the development of depression, which decreases the quality of life of patients. Studies providing information about acute pancreatitis in relation to depression were not performed in Latvia. The aim is to find out depression symptoms and risk factors among people with acute and chronic pancreatitis history in Latvia.

**Materials and Methods.** A cross-sectional survey was conducted. Participants of the survey (adults from Latvia) were invited through social media. The participants were split into 3 groups: those who have/had acute pancreatitis during past year (AP group), those who have/had chronic pancreatitis during past year (CP group) and those who have never had pancreatitis (control group). The survey included questions about participants' age, sex, education, pancreatitis history, chronic and severe diseases history, violence experience, history of stressful events in participants' lives and families, their family's mental health, PHQ-9 scale and the Alcohol Use Disorders Identification Test (AUDIT).

**Results.** 3 groups were formed: AP group (n=32), CP group (n=33) and control group (n=44). There was no statistically significant difference between PHQ-9 scores in AP and control groups but there was a significant difference between PHQ-9 scores in CP and control groups (p=0.03). There was a correlation between number of depression risk factors and PHQ-9 score within the whole sample (r=0.278, p=0.003) but after splitting into said groups, the correlation was considered statistically insignificant (r=0.126-0.326, p>0.05).

**Conclusion.** People who have chronic pancreatitis are more likely to experience more severe depression. This could mean that patients with chronic pancreatitis could need some treatment of depression.

## COMPUTED TOMOGRAPHY AND CLINICAL EXAMINATION FINDINGS TO PREDICT THE PRESENCE OF DELIRIUM IN PATIENTS WITH TRAUMATIC BRAIN INJURY

Author: *Deividas Nekrosius*<sup>1</sup>

Scientific research supervisor: Dr. med. *Adomas Bunevicius*<sup>1,2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Neuroscience Institute, Lithuania*

**Keywords.** Traumatic brain injury (TBI); Delirium; Computed Tomography (CT); Glasgow Coma Scale (GCS).

**Objectives.** The most common cognitive disturbance after TBI is post-traumatic agitation that may lead to delirium. Greater age, alcohol abuse, surgery, more severe TBI are associated with increased delirium risk. The goal of this study was to determine clinical and radiological findings contributing to the diagnosis of delirium.

**Materials and Methods.** Prospective observational cohort study was conducted. 78 patients admitted to neurosurgical ward for treatment of complicated mild (GCS 13-15) to moderate (GCS 9-12) TBI were included. Patients were assessed for delirium symptoms using the Confusion Assessment Method and Richmond Agitation-Sedation Scale for four consecutive days. CT imaging and blood count findings, Alcohol Use Disorders Identification Test - Consumption (AUDIT-C), demographic and clinical characteristics were evaluated.

**Results.** Mean age of the study patients was 60 (SD 16,6) years. The majority of patients were male (72%). Delirium was diagnosed in 23 (29,5 %) patients. The proportion of patients who underwent surgical treatment was similar in the delirium and non-delirium groups (43,5% and 27,3%, respectively,  $p = 0,162$ ). In unadjusted univariate regression analyses, the following factors were associated with increased delirium risk: lower admission GCS score ( $p = 0,001$ ), temporal lobe lesion ( $p = 0,05$ ), right sided intracranial lesion ( $p = 0,02$ ), Rotterdam CT score greater than 2 points ( $p = 0,032$ ), lower hemoglobin ( $p = 0,01$ ) and hematocrit ( $p = 0,008$ ) values. In multivariate model, advanced age ( $p=0,004$ ), hazardous drinking ( $p=0,01$ ), intracranial hematoma on the right side of the brain ( $p=0,005$ ), intracerebral hematoma in the temporal lobe ( $p=0,046$ ), lower admission GCS ( $p=0,025$ ) were associated with significantly higher risk of delirium.

**Conclusion.** Greater age, lower admission GCS score, hazardous alcohol abuse, intracerebral hemorrhage in the temporal lobe and right-sided brain lesion increase delirium risk in TBI patients.

## DEPRESSION AMONG POLISH MEDICAL STUDENTS AND ITS LINK WITH PROBLEMS WITH MEDICAL STUDIES

Authors: *Paulina Drożak*<sup>1</sup>, *Katarzyna Augustowska*<sup>1</sup>, *Lukasz Bryliński*<sup>1</sup>,  
*Agata Bura*<sup>1</sup>, *Martyna Drożak*<sup>1</sup>, *Piotr Duda*<sup>1</sup>

Scientific research supervisor: Dr. *Grzegorz Mizerski*<sup>1</sup>

<sup>1</sup> *Medical University of Lublin, Poland*

**Keywords.** Depression; medical students.

**Objectives.** During medical studies, students are subjected to various stressors, such as: large workload, high academic requirements, time commitment and emotional burden. Thus multiple studies have shown that rates of depression among medical students are higher than in general population. The aim of the study was to investigate the prevalence of depression among medical students in Poland and to determine factors associated with this disease that are related to medical studies.

**Materials and Methods.** A cross-sectional questionnaire-based study was carried out including 1023 medical students from each year of medical studies and each of the 18 Polish universities that offer medical education. The questionnaire included a 9-Item-Patient Health Questionnaire (PHQ-9) to assess depression and author's questions to collect information about sociodemographic characteristics and investigated factors. The answers to the questionnaire were collected in the April of 2020.

**Results.** About a half of the participants (51.61%, 95% CI: 48.50 – 54.72) were found to have major depression (PHQ Score  $\geq$  10). Overall, 30.21% of the respondents were classified as having mild depressive symptoms, 26.00% - moderate depressive symptoms and 15.05% - moderately severe depressive symptoms. 1 in 10 of them (10.56%) had symptoms of severe depression. A highly statistically significant relationship was found between major depression and: low self-assessment of academic performance during studying, repeating a year of university education, considering resignation from medical studies and feeling of not having chosen medical studies rightly. No relationship was found between depression and: year of medical studies and gender.

**Conclusion.** Prevalence of depression among medical students in Poland is high. The research suggests that depression is related to multiple problems that occur during studying medicine. Therefore, the study highlights the importance of prevention and raising awareness of this disease among medical students.

## FREQUENCY OF ANXIETY SYMPTOMS AND ASSOCIATED ACADEMIC AND EMPLOYMENT STATUS FACTORS AMONG RSU MEDICINE FACULTY STUDENTS

Authors: *Veronika Saviča*<sup>1</sup>, *Kellija Akimova*<sup>1</sup>, *Anastasija Ševčenko*<sup>1</sup>,  
*Paula Marija Vimba*<sup>1</sup>, *Ieva Vadone-Ozoliņa*<sup>1</sup>

Scientific research supervisor: Dr. *Laura Valaine*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia*

**Keywords.** Anxiety, shift work, remote learning, academic performance.

**Objectives.** Anxiety remains an important issue among medical students where factors such as learning model, self assessment and work schedule can contribute to worsening anxiety symptoms. The aim of this study was to assess the frequency of anxiety symptoms and associated academic and employment status factors among RSU medical students.

**Materials and Methods.** A quantitative cross-sectional study in the population of latvian medical students of Rīga Stradiņš University was made in October - December 2020. In the study participated 117 students. Anxiety symptoms were assessed using the Generalized anxiety disorder (GAD-7) scale. Employment status was assessed by asking participants questions whether they have a job, whether they work shifts and which amount of shifts per month. A Likert scale was used to measure subjective evaluation of academic achievements and satisfaction with studies. Data was analyzed using SPSS-Spearman's rank correlation coefficient, Mann-Whitney U test, Kruskal Wallis test.

**Results.** In the study participated 83,8% females (n=98) and 16,2% males (n=19). Participants were on average  $22 \pm 2,89$  years old, 71,8%(n=84)- were employed and 77,38%(n=65) of them working shifts ,whereas 28,2%(n=33)- were unemployed. 43,6%(n=51) of participants had anxiety symptoms. Employed students had less severe anxiety symptoms than unemployed(p=0,006).

Students working shift job had less prominent anxiety symptoms than unemployed students(p=0,010), whereas the statistically significant difference between the amount of shifts per month and anxiety symptoms was not detected(p=0,138).

There was found a positive correlation between anxiety symptoms and satisfaction with subjective evaluation of academic performance( $r=0,376$ ,  $p<.01$ ), whilst there was not detected statistically significant association and correlation between anxiety symptoms and satisfaction with quality of remote learning (p=0,471).

**Conclusion.** Anxiety symptoms are very common among medical students (43,6%). Students working shift job have lower anxiety symptom scores, whereas students who are satisfied with academic performance have more prominent anxiety symptoms.

## CORRELATION BETWEEN SYMPTOMS OF SLEEP DISORDERS AND MENTAL HEALTH AMONG LATVIAN STUDENTS OF RSU

Authors: *Līva Auziņa*<sup>1</sup>, *Anna Paula Spriedēja*<sup>1</sup>, *Justīne Ciganovska*<sup>1</sup>, *Marina Audrupe*<sup>1</sup>  
Scientific research supervisor: Dr. *Laura Valaine*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia*

**Keywords.** Sleep quality, students, stress, depression, anxiety.

**Objectives.** Students have always been at a higher risk for mental health and sleep problems. The aim of this study was to assess the correlation between symptoms of anxiety, depression, stress and sleep quality among Latvian students of RSU.

**Materials and Methods.** A quantitative cross – sectional study in the population of RSU students was made in December 2020 – January 2021. In the study participated 276 participants. Symptoms of mental health were assessed using Depression, Anxiety and Stress Scale (DASS21), symptoms of sleep disorders- using the Pittsburgh Sleep Quality Index (PSQI). Statistical analysis (Chi- square test, Fisher's exact test) was performed using SPSS.

**Results.** In the study participated 87,7 % (N=242) females, mean age 21,5±3,1. 87,3 % (N=241) participants had bad sleep quality (PSQI>5).

There is a statistically significant association between symptoms of depression and sleep quality (p=0,005) – within the group of bad sleep quality 23,7% of the students reported moderate or severe depression while in the group of good sleep quality - 8,6%.

There is a statistically significant association between symptoms of anxiety and sleep quality (p<0,001). Within the group of participants with bad sleep quality 43,9% had mild or moderate level of anxiety, in the group with good sleep quality- 11,5%

Within the group of participants with bad sleep quality 46,5% had normal level of stress, while in the group of good sleep quality- 82,9%. There is a statistically significant association between sleep quality and the level of stress (p< 0,001).

There is a statistically significant moderate positive correlation between global PSQI score and depression (r=0,332; p<0,001), anxiety (r=0,480; p<0,001), stress (r=0,498; p<0,001).

**Conclusion.** Majority of the surveyed RSU students (87,3%) have bad sleep quality. Students with bad sleep quality experience symptoms of depression, anxiety, and stress more often.



## EVALUATION OF ANXIETY AND DEPRESSION LEVELS IN ONCOLOGICAL PATIENTS WHO ARE RECEIVING CHEMOTHERAPY

Author: *Anta Donerblica*<sup>1</sup>

Scientific research supervisor: Dr. *Artūrs Miksons*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Depression, anxiety, oncology.

**Objectives.** Diagnosis of cancer can be a significant stressor in a person's life thus induce anxiety and depression. Mental illness can impact both the general quality of life and adherence to therapy. The aim of this study is to evaluate levels of anxiety and depression in oncology patients who receive chemotherapy.

**Materials and Methods.** A prospective research was done, adults diagnosed with oncological illness in different stages who receive chemotherapy were enrolled in this study and compared to a control group. Participants were asked to fill out PHQ9 and GAD7 questionnaires twice with 3-month interval. Additional information about gender, age, stage of cancer was obtained to assess the possible relation to PHQ9 and GAD7 scores. All data were analysed with IBM SPSS (Mann-Whitney U-test, Kruskal Wallis test, Willcoxon test, Spearman`s correlation).

**Results.** 34 cancer patients receiving chemotherapy were enrolled – 41.2% (n=14) male, 58.8% (n=20) female the mean age was 58.21 years (range 25 to 82 years). They were compared with a group of healthy adults 30.8% (n=12) male, 69.2% (n=27) female, the mean age was 35.87 years (range 20 to 76 years). Overall, the prevalence of moderate or more severe depression in the oncology group was 41.1% (n=14) and it was found to be with a statistically significant difference from the control group (p=0,005) in which results were 13% (n=5). There was no statistical difference found between the first and second time of PHQ9 survey in any group (p=0.539). No statistical correlation was found between the stage of cancer and PHQ9 results (correlation coefficient = 0.797). In GAD7 results there is no statistically significant difference between groups (p=0.926).

**Conclusion.** This study shows that depression classified as moderate or more severe was found more often in oncology patients than in average population in Latvia. Suggesting use of PHQ9 in everyday praxis in oncology.

## CORRELATION BETWEEN DEPRESSIVE SYMPTOMS AND SCREEN TIME DURING THE COVID-19 PANDEMIC IN LATVIA

Author: *Kristīne Feldšere*<sup>1</sup>

Scientific research supervisor: Dr. *Laura Valaine*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Psychosomatic Medicine and Psychotherapy, Latvia*

**Keywords.** Screen time, depression, Covid-19.

**Objectives.** Studies show that increased screen time may be a factor contributing to development of symptoms of depression. During the Covid-19 pandemic screen time has increased significantly among vast sections of the global population. The aim of the study was to discover whether increased screen time, among people aged 18 to 35, correlates with frequency of symptoms of depression.

**Methods.** A quantitative cross-sectional study for the population of Latvia aged between 18 and 35 was made in December-January 2020/2021. In the study participated 288 respondents. Depression symptoms were assessed using Patient Health Questionnaire-9 (PHQ-9) scale, participants were asked about their occupation – studies, work or both, screen time and its purpose when using TV, mobile or computer screens. Data was analysed using SPSS- Spearman's correlation, Kruskal-Wallis test.

**Results.** The age median is 22 (IQR 3) years. 76%(n=219) of participants were studying, 58%(n=168) of participants were working. The average total time spent using screen devices was 12,5±5,0h. The average screen time using a mobile phone was 4,8±2,9h, using a computer- 6,7±3,7h, using a TV screen- 1,0±1,52h. 2.4%(n=7) of participants have no depression symptoms, 19%(n=55)- minimal depression, 31%(n=90)- mild depression, 23%(n=65)- moderate depression, 19%(n=54)- moderately severe depression and 6%(n=17)- severe depression. There was a weak positive statistically significant correlation between PHQ-9 score and total screen time ( $r=0,175$ ;  $p=0,003$ ). Stratified by screen type, there was weak positive statistically significant correlation between PHQ-9 score and screen time using mobile phone ( $r=0,248$ ;  $p<0,001$ ).

**Conclusions.** Participants of the study with higher screen time had more severe symptoms of depression. There is a statistically significant association between spending time behind mobile phone's screen and symptoms of depression.

## DEPRESSION IN HEARING IMPAIRED ADULTS

Author: **Gabriela Kronberga**<sup>1</sup>

Scientific research supervisor: Dr. **Artūrs Miksons**<sup>1,2</sup>, Assist. Prof. **Gunta Sumeraga**<sup>1,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia*

<sup>3</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Depression, hearing loss.

**Objectives.** Depression is a common mental illness and based on the latest available data it affects in average 6.7% of Latvian population. Aim of our study was to assess the level of depression in hearing impaired adults, determine the possible contributing factors and compare results with the average depression level in the Latvian population.

**Materials and Methods.** In this cross-sectional study, adults with five different stages of hearing loss were enrolled. Participants were asked to fill out Patient Health Questionnaire-9 (PHQ9) in voluntary basis in Pauls Stradiņš Clinical University Hospital, medical institution "Hearing systems" and electronically through hearing impairment support associations from March to December 2020. Additional information about gender, age, time of hearing loss, affected side were obtained to assess possible relation with PHQ9 score and depression degree. All data were summarized using MS Excel and analysed with IBM SPSS 25 (Spearman's correlation).

**Results.** Altogether 80 hearing impaired adults were enrolled – 26.25% (n=21) men, 73.75% (n=59) women. The mean age was 50.43 years (range 20 to 86 years). Overall, the prevalence of depression in hearing impaired adults was 45.1% (n=36) (25.0% mild, 13.8 % moderate, 6.3% moderately severe). Prevalence among men 19% (n=4), among women 54% (n=32). There was moderate negative correlation between depression score and degree of hearing loss. ( $r = -0.356$ ,  $p=0.001$ ) as well as between age ( $r = -0.361$ ,  $p=0.001$ ). There were no statistically significant correlations between depression score and gender, time when hearing loss appeared, affected side and cause.

**Conclusion.** Results of this study showed that there is higher prevalence of depression in hearing impaired adults than in average population in Latvia. Depression was more common among hearing impaired women than men. The moderate negative correlation showed that higher degree of hearing loss and older age have lower rates of depression.

## ASSESSMENT OF PATIENTS WITH MULTIPLE SCLEROSIS ACCORDING TO EXPANDED DISABILITY STATUS SCALE AT RĪGA EAST UNIVERSITY HOSPITAL

Author: *Olga Holodova*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Daina Pastare*<sup>1,2</sup>, Assoc. Prof. *Guntis Karelis*<sup>1,2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga East Clinical University Hospital, Latvia*

**Keywords.** Multiple Sclerosis, Expanded Disability Status Scale.

**Objectives.** Multiple sclerosis (MS) is autoimmune central nervous system (CNS) disease. MS is classified according to the course of disease: relapsing-remitting (RRMS), primary progressive (PPMS), secondary progressive MS (SPMS), clinically isolated syndrome (CIS). The diagnosis of SPMS is challenging and often made retrospectively. Expanded Disability Status Scale (EDSS) is applied to diagnose SPMS for patients with previous RRMS. SPMS patients should have EDSS score at least 4, this course is associated with relatively poor prognosis.

The aim is to define average levels of EDSS in patients with different MS course and its association with disease-modifying treatment. To identify the RRMS patients with possible SPMS course.

**Materials and Methods.** Cross sectional study based on medical histories of MS patients from Rīga East University hospital. IBM SPSS 23.0 and Microsoft Excel 2016 were used.

**Results.** There were included 161 MS patients: 94 women (58.4%), 67 men (41.6%) at average age  $41 \pm 11.67$  ( $p < 0.005$ ). In RRMS group 131 (81.9%), SPMS 15 (9.4%), PPMS 6 (3.8%), and 7 (4.4%) patients with CIS were presented. Median EDSS level in RRMS group was 2 (IQR 1.5 - 3); SPMS - 6 (IQR 4.5 - 6.5); PPMS - 5 (IQR 2.5 - 6.5); CIS - 1 (IQR 1 - 1.5). EDSS > 4 was found in 21 (16.4 %) RRMS, 14 (93.3%) SPMS and 4 (66.7%) PPMS patients. All patients with CIS had EDSS < 4, ( $p < 0.005$ ). No significant differences in EDSS levels were detected in different treatment groups.

**Conclusion.** The highest EDSS level was shown among SPMS patients. 16.4% of RRMS patients have significant disability and high risk to turn into SPMS course. Clinical isolated syndrome is usually presented with mild disability. No significant differences in EDSS levels were detected in different therapy groups because of small number of patients in each group.

## COMPARISON OF BURNOUT SYNDROME AND ASSOCIATED FACTORS IN LOCAL RSU HEALTH CARE AND SOCIAL SCIENCE STUDENTS

Author: *Serafima Grigorjeva*<sup>1</sup>

Scientific research supervisor: Dr. *Laura Valaine*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia*

**Keywords.** Burnout, health care, social sciences.

**Objectives.** It is believed that burnout is more commonly met in human service workers, as medical professionals, social workers, educators. The aim of this study was to assess and compare frequency of burnout syndrome and associated factors among local Rīga Stradiņš University (RSU) health care and social sciences students.

**Materials and Methods.** A quantitative cross-sectional study in the population of local students of RSU was conducted in November-December 2020. In the study participated 382 students. Burnout symptoms- exhaustion, cynicism and professional efficacy- were assessed using Maslach Burnout Inventory. Participants were asked about study year and satisfaction with relationship with parents. Data was analyzed using SPSS- Mann-Whitney U test, Kruskal-Wallis H Test.

**Results.** In the study participated 90,1% (N=344) females, median age of participants 21 (IQR = 2). 80,9% (N=309) students were from health care study programs.

84,8% (N=168) health care and 76,4% (N=55) social sciences students had at least one symptom of burnout. Health care students had higher exhaustion level compared with social science students ( $p=0,015$ ). There was no statistically significant difference in symptoms of professional efficacy ( $p=0,465$ ) and cynicism ( $p=0,484$ ) among health care and social science students.

Health care students in beginning and ending years had higher level of exhaustion ( $p=0,002$ ), health care students in higher study years had higher level of cynicism ( $p<0,001$ ), whereas social sciences students did not have such association ( $p=0,396$ ;  $p=0,34$ ).

Health care and social science students who were not satisfied with the relationship showed lower professional efficacy ( $p<0,001$ ;  $p=0,013$ ). Health care students who were not satisfied with the relationship showed higher level of exhaustion and cynicism ( $p=0,003$ ;  $p=0,001$ ).

**Conclusion.** Health care students had higher level of exhaustion compared with social science students, but no difference of cynicism and professional efficacy. Health care students are more affected by the contributing factors than social sciences students.

## FREQUENCY OF BURNOUT SYNDROME AND ASSOCIATED FACTORS AMONG LOCAL STUDENTS OF RSU

Author: *Serafima Grigorjeva*<sup>1</sup>

Scientific research supervisor: Dr. *Laura Valaine*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia*

**Keywords.** Burnout, students.

**Objectives.** The burnout syndrome affects a lot of students and during Covid-19 pandemic more factors favor development of it. Burnout affects negatively professionalism, ethical behavior, empathy, as well as increase the risk of depression and academic failures. The aim of the study was to assess frequency of burnout syndrome and associated factors among local students of Rīga Stradiņš University (RSU).

**Materials and Methods.** A quantitative cross-sectional study in the population of local students of RSU was conducted in November-December 2020, in the study participated 382 participants. Burnout symptoms were assessed using Maslach Burnout Inventory that addresses three symptom scales– exhaustion, cynicism and professional efficacy. Participants were asked about academic and work-related factors. Data was analyzed using SPSS- Mann-Whitney U test.

**Results.** In the study participated 90,1% (N=344) females, median age of participants-21(IQR=2).

83,2%(N=317) students have at least one of the symptoms of burnout; 24,4%(N=93) had all 3 symptoms of burnout. Moderate professional efficacy showed in 38,7%(N=148) and low in 45,3%(N=173) students. High exhaustion showed in 68,3%(N=261), moderate in 16,5%(N=65) students. High cynicism showed in 52,4%(N=200), moderate in 26,2%(N=100) students.

93,2%(N=356) students were satisfied with chosen study program and showed lower score on burnout (professional efficacy, exhaustion, cynicism) scales ( $p<0,001$ ;  $p<0,001$ ;  $p<0,001$ ).

62,0%(N=237) were satisfied with study achievements and showed lower score on burnout scales ( $p<0,001$ ;  $p<0,001$ ;  $p<0,001$ ).

34,1%(N=245) were satisfied with study environment and showed lower score on burnout scales ( $p=0,006$ ;  $p<0,001$ ;  $p<0,001$ ).

49,0%(N=187) students have additional job, but it did not have an association with score on burnout scales ( $p=0,097$ ;  $p=0,281$ ;  $p=0,303$ ).

**Conclusion.** Burnout syndrome is common among local students of RSU. There is statistically significant association between satisfaction with the study program, study achievements, study environment and lower score on burnout syndrome scales. There is no statistically significant association between having burnout symptoms and having additional job.

## LIVE FAST, DIE YOUNG: AN ANALYSIS OF FATALITIES INVOLVING STIMULANT DRUGS

Author: *Ignas Planutis*<sup>1</sup>, *Algirdas Konradas Liekis*<sup>1</sup>  
Scientific research supervisor: Dr. *Jurgita Stasiūnienė*<sup>1</sup>

<sup>1</sup>*University of Vilnius, Lithuania*

**Keywords.** Stimulants, Opioids, Overdose, Speedball, Psychoactive.

**Objectives.** In Northern Europe in the wider problem of drug abuse and addiction, stimulant abusers are a minority, dwarfed by the much bigger issue of opioid abuse. However, stimulants can be just as deadly, especially when used together with opioids, a drug combination that is commonly known as „speedball“.

Our objective was to determine age and sex of psychoactive stimulant fatalities, causes of death, most commonly abused stimulant drugs and number of cases featuring combination of stimulant and opioid overdose.

**Materials and Methods.** We examined the 243 autopsy records from Lithuanian State Forensic Medicine Service looking for cases of death involving stimulant drugs. 21 such cases were identified and included for further analysis using R commander software.

**Results.** The average age of the deceased was 32,38 years. Majority of them were male – 18 cases (85,71%) while in 3 cases (14,29%) they were female. In 10 bodies of the deceased (47,61%) evidence of simultaneous stimulant and opioid intoxication was found. The most popular stimulant used was methamphetamine (found in 10 cases), followed by amphetamine (8 cases) and cocaine (4 cases). Amongst 21 stimulant users, toxic effect of drugs was a direct cause of death in 8 cases, while toxic effect of drugs with alcohol involvement – in 4 cases. Other causes of death included accidental deaths (6 cases), suicide (2 cases) and pneumonia (1 case).

**Conclusion.** Majority of deceased were male, average age was 32,38 years. The most commonly used substances were methamphetamine and amphetamine. Majority of stimulant users died of direct toxic effect of drugs on the body.

# PUBLIC HEALTH, OCCUPATIONAL MEDICINE, NUTRITIONAL SCIENCE, REHABILITOLOGY

## ADVERSE CHILDHOOD EXPERIENCES AS A PREDICTOR OF WORSENE WELL-BEING AMONG POLISH MEDICAL AND DENTAL STUDENTS

Authors: *Paulina Drożak*<sup>1</sup>, *Piotr Duda*<sup>1</sup>, *Martyna Drożak*<sup>1</sup>, *Agata Bura*<sup>1</sup>,  
*Łukasz Bryliński*<sup>1</sup>, *Katarzyna Augustowska*<sup>1</sup>

Scientific research supervisor: Dr. med. *Grzegorz Mizerski*<sup>1</sup>

<sup>1</sup> *Medical University of Lublin, Poland*

**Keywords.** Adverse childhood experiences; medical students; dental students.

**Objectives.** Effects of exposure to adverse childhood experiences (ACEs) are a significant public health problem. There is a well-documented evidence for the negative impact of ACEs on multiple mental and physical health outcomes later in life. The aim of the study was to investigate the prevalence of ACEs among medical and dental students in Poland and to discover consequences associated with exposure to them.

**Materials and Methods.** This cross-sectional study was conducted among 934 medical and 228 dental students (a total of 1162 participants) from 18 Polish universities. The survey included Adverse Childhood Experiences questionnaire and author's questions to collect information about sociodemographic characteristics and investigated factors. The answers were collected in the April of 2020.

**Results.** 57.4% of the participants had at least 1 exposure to ACEs, 8.43% had 4 or more ACEs. The most commonly reported adversities were emotional neglect (23.06%), emotional abuse (22.98%) and mental illness in a household member (21.86%). Higher percentage of women than men reported emotional abuse (OR=1.37, 95% CI=0.98–1.93, p=0.03), sexual abuse (OR=4.28, 95% CI=1.31–13.95, p=0.008) and emotional neglect (OR=1.51, 95% CI=1.07–2.13, p=0.009). In case of emotional neglect, a relationship was found between this adversity and female gender. An overall graded statistically significant relationship was found between ACE score and: frequent feelings of loneliness, low self-assessment of academic performance during studying, repeating a year of university education, problems with maintaining stable body weight, reaching for alcohol in order to de-stress and not being religious.

**Conclusions.** Adverse childhood experiences among Polish medical and dental students are common. There is a significant link between them and multiple aspects of worsened well-being in adult life of the students. The study emphasizes the importance of raising awareness of childhood adversities in order to prevent them and help those who are affected by them.



## EXTENT OF PALLIATIVE CARE NEED AMONG CANCER PATIENTS UNDERGOING CHEMOTHERAPY: A CROSS SECTIONAL STUDY

Authors: *Sai Prasad*<sup>1</sup>, *Snehal Bathe*<sup>1</sup>, *Jangala Sai Vihar*<sup>1</sup>,  
*Amlina Priyadarshini*<sup>1</sup>, *Adithya Mohan*<sup>1</sup>

Scientific research supervisor: Prof. *Tilak TVSVGK*<sup>1</sup>

<sup>1</sup> *Armed Forces Medical College, India*

**Keywords.** Palliative Care, GSF Prognostic Indicator, SPARC, Chemotherapy, Cancer.

**Objectives.** To measure the degree of unmet needs among patients undergoing chemotherapy in a tertiary care centre using a validated questionnaire- the Sheffield Profile For Assessment And Referral To Care (SPARC) questionnaire.

To measure the extent of palliative care requirement in patients using the Gold Standards Framework Prognostic Indicator.

**Materials and Methods.** A comprehensive survey was undertaken among cancer patients undergoing chemotherapy in a tertiary care centre in Western Maharashtra in February, 2020. After due consent, participants were screened for palliative care need according to the Gold Standards Framework (GSF) Prognostic Indicator criteria. Participants also completed the Sheffield Profile for Assessment and Referral to Care (SPARC), a needs assessment tool that measures unmet needs across 7 domains from 0-3.

**Results.** 127 cancer patients were included, with a mean age of 55.39 + 12.68. A total of 38% of participants met the GSF criteria for palliative care need. Patient self reported data indicated that participants who rated a score of 3 for one or more domains in the SPARC questionnaire were 4.7 times more likely to meet the GSF criteria. The most frequently reported unmet needs among these patients were fatigue (76%), pain (71%), anxiety (49%), dependence (49%) and bowel and bladder issues (38%). Participants aged 60 and above scored higher on domains like loneliness and fatigue, compared to younger age groups who reported more concerns about issues like loss of independence, anxiety, etc.

**Conclusions.** Our results reveal that over a third of cancer patients undergoing chemotherapy met the GSF criteria for palliative care need. It provides evidence of a large unmet need across various domains among patients, who may benefit from introduction of adjunctive palliative care, and lends support for the use of similar tools in the hospital setting.

## EATING HABITS OF NON-PROFESSIONAL MALE MARATHONERS (≥45Y) DURING MARATHONS

Authors: *Kelly Leppik*<sup>1</sup>, *Heilis Veesaar*<sup>1</sup>

Scientific research supervisors: Dr. med. *Ülle Parm*<sup>1</sup>, PhD *Anna-Liisa Tamm*<sup>1</sup>

<sup>1</sup> *Physiotherapy and Environmental Health Department, Tartu Health Care College, Estonia*

**Keywords.** Marathon, non-professional, male marathoner, eating habits, fluid intake, food supplements.

**Objectives.** Balanced food and fluid consumption plays role in sports performance and maintaining good health in general. There is no specific overview of eating habits, fluid, supplement and vitamin consumption of Estonia's non-professional male marathoners and so they would participate in the competition without proper preparation risking their own health. The aim of this study was to assess non-professional ≥45-year-old male marathoners eating habits and fluid consumption before and during the marathon. Also earlier participation in different marathons and preparation for current stage was investigated.

**Materials and Methods.** Study has ethical approval (no 287/T-9; 19.11.2018). The sample consisted of all ≥45-year-old non-professional male marathoners who registered to Tartu Marathon Cube (skiing, road cycling, running) and agreed to participate in study (n=179). Participants filled in the questionnaire. Descriptive statistics was used for data analysis, t-test, Mann-Whitney or  $\chi^2$  test for comparing between groups.

Results. 98.5% of the participants had taken part of at least one marathon previously. The median of participation in previous marathons was 36 (IQR 7.5-66) and passed 2111.5 km (IQR 920-4565). Subjects trained  $4.8 \pm 4.2$  times and  $7.2 \pm 7.8$  h/week for each marathon, which is mainly sufficient. All marathoners (skiing n=84, cycling n=32, running n=26; mean age  $51.7 \pm 7.2$ y) were omnivores, their daily quantity of meals corresponded to recommendations. 13.9% and 10.3% monitored their calorie intake daily and while preparing for marathon, respectively. 73.5% visited food stops in median of  $4.8 \pm 2.5$  times per marathon. In addition, gels, energy bars, and glucose tablets were brought along with themselves 36%, 16.2% and 3.7%, respectively. Marathoners were in danger of fluid over-consumption pre-marathon ( $1.9 \pm 0.8$  l), but their fluid consumption during marathon was optimal ( $534 \pm 0.4$  ml/h). Magnesium was the most popular supplement daily (32.4%), and during marathon (23.5%), vitamins C and D were also consumed.

**Conclusions.** Most of the participants were experienced marathoners, but for further suggestions individual dietary analysis is needed.

## DROWNING ASSOCIATED RISK GROUPS IN A FIVE-YEAR TIME PERIOD IN RĪGA AND RĪGA PLANNING REGION: AGE AND ALCOHOL CONCENTRATION IN BLOOD

Author: *Evelīna Stepīņa*<sup>1</sup>

Scientific research supervisors: Dr. *Marta Riekstiņa*<sup>1,2</sup>, Dr. *Vladislavs Zaborovskis*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

<sup>3</sup> *State Centre for Forensic Medical Examination of the Republic of Latvia*

**Keywords.** Swimming, drowning, risk factors, Rīga.

**Objectives.** Drowning is the 3rd leading cause of unintentional injury of death worldwide. These deaths are often unintentional, classified as accidents and instantaneous. Yet they are potentially preventable. There are several factors that could be associated with risk groups within our population. Aim of this study is to determine whether elevated alcohol consumption and specific age group determines higher chance an individual will drown.

**Materials and Methods.** A study was carried out involving fatal drowning victim cases from January 1st, 2015 to December 31st at the State Centre for Forensic Medical Examination of the Republic of Latvia. All recorded data were analysed using MS Excel and IBM SPSS.

**Results.** 215 victim cases were enclosed in this study. Mean age is 51 (95% CI, 48-54) with alcohol concentration 1,35‰ (95% CI 1,17-1,54). The 53,5% of drowning victims were in age group 35 to 64 (n=114), 24,9% were 65+ (n=53), 16% were 20 to 34 (n=34), 4,7% were 15 to 19 (n=10), 0,9% were 0 to 4 (n=2). The highest median alcohol concentration in blood was in age group 35 to 64 (2,23‰, IQR 2,99‰, 95% CI 1,52-2,04), followed by age group 20 to 34 (1,24‰, IQR 2,68‰, 95% CI 0,93-1,90), 65+ (0,00‰, IQR 1,23‰, 95% CI 0,31-0,80), while the lowest was in age group 15 to 19 (0,00‰, IQR 0,61‰, 95% CI -0,11-0,93). Correlation between alcohol concentration in blood and age was low and positive but statistically significant ( $r=0.161$ ,  $p<0.05$ ).

**Conclusions.** Significantly elevated blood alcohol concentration within age group 35 to 64 determines, that these individuals statistically have higher risk to fall into category of drowning victims.

## UNDERSTANDING PERCEPTIONS AND BARRIERS TOWARDS LEARNING SELF-DEFENSE AMONG MEDICAL GRADUATES THROUGH HEALTH BELIEF MODEL

Author: *Shradha Prakash*<sup>1</sup>

Scientific research supervisor: Dr. *Smitha Malenahalli Chandrashekarappa*<sup>1</sup>,  
Dr. *Chandana Hombaiah*<sup>1</sup>, Prof. *M R Narayana Murthy*<sup>1</sup>

<sup>1</sup> *JSS Medical College, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India*

**Keywords.** Medical graduates, Self-defense, Violence, Abuse, Occupational safety.

**Objectives.** The increasing proclivity of violence against the health care workers (HCW's) has become a startling new epidemic. Indian medical association reports that 75% of doctors have experienced violence at work and the main source of stress for doctors was fear of violence. Though learning self-defense is beneficial in such scenarios, the number of HCW's who have acquired this skill remains very low. The objective of this study was to assess the Perception and barriers towards learning self-defense among Medical graduates through Health Belief Model

**Materials and Methods.** This descriptive cross-sectional study included 206 medical graduates among whom a standardized pre-tested, validated questionnaire based on the health belief model was distributed. Purposive sampling was adopted. Data was analyzed using SPSS V. 24.

**Results.** We found that, 17.5% strongly agreed that they are susceptible to violence in their professional life and 43.2% of them agreed that becoming a victim of such violence would affect their physical or mental health. Around 58.3%, 50.5% and 53.4% of them agreed that they would be able to defend themselves if they learn self-defense, that learning self-defense will reduce their worries of becoming a victim to violence and that they will be able to use self-defense effectively once learnt. Most common perceived barrier to learning self-defense was lack of time. Association between agreed and disagreed category under perceived susceptibility, perceived severity and perceived benefits and gender and association between gender and scholastic year with self-efficacy was found to be statistically significant at p-value <0.05.

**Conclusions.** Majority perceived that they were at a higher risk of violence in their profession and that learning self-defense would help them. Hence we would recommend that self-defense be included as a part of curriculum in medical education thus helping in creating, confident medical professionals.

## HOW IS SEXUAL WELLBEING DEFINED IN SCIENTIFIC LITERATURE?

Author: **Lore Remmerie**<sup>1</sup>

Scientific research supervisor: Prof. Dr. **Kristien Michielsen**<sup>1</sup>

<sup>1</sup> ICRH, Department of Public Health and Primary Care, Ghent University

**Keywords.** Sexual wellbeing, sexual health.

**Objectives.** The concept of sexual wellbeing is increasingly used in scientific literature. However, no official definition has yet been established. Therefore the question can arise to what extent the different researchers on sexual wellbeing, investigated the same concept. In this systematic literature review, we explored how the concept of sexual wellbeing is defined in scientific research.

**Methods.** We performed a systematic literature study in Pubmed and Web Of Science following the PRISMA guidelines. Original articles published since 1975 up to mid-2019 that mentioned “Sexual wellbeing” in the title were included. Definitions, sub-constructs and measurement methods of sexual wellbeing were extracted from the articles and analyzed.

**Materials and Methods.** A minority of the 82 included articles defined the concept of sexual wellbeing (N= 31/82). The most commonly cited definitions were the sexual health definition from the WHO (2006) and the definition of subjective wellbeing of Diener. The most commonly used subconstructs are: Sexual satisfaction (N=59), sexual function (N=50), frequency of sexual activity (N=28), desire (N=27), love and affection/partner communication (N=26), self-esteem (N= 25) and feeling comfortable during sex (N=24). Variable combinations of these indicators were used as measurement tools.

**Conclusions.** Sexual wellbeing is increasingly mentioned in scientific research but the interpretation of what it means differs substantially. The main focus of sexual wellbeing remains on the subjective evaluation but the more objective sub-constructs, such as sexual function and sexual frequency, are also frequently considered to be a part of sexual wellbeing. There is a need for an universal definition and well-founded indicators to encourage consistent interpretations and measurements of sexual wellbeing in future research. We made a proposition for a possible definition and indicators based on similarities and differences in definitions and sub-constructs found in the literature.

## TOTAL PHENOLS, ANTIRADICAL AND ANTIOXIDANT ACTIVITY OF DIFFERENT TYPES OF TEA AVAILABLE IN LATVIAN RETAIL

Authors: *Ksenija Ņikuļcova*<sup>1</sup>, *Laura Čerpakovska*<sup>1</sup>

Scientific research supervisors: Msc.chem. *Dmitrijs Kustovs*<sup>1</sup>,  
Msc.chem. *Z. Čerpakovska*<sup>1</sup>, Asoc. Prof. Dr. biol. *Andrejs Šķesters*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Tea, antioxidants, polyphenols, DPPH, FRAP.

**Objectives.** Insufficient antioxidant capacity in the body creates the possibility of oxidative stress. Tea is among the most consumed drink worldwide, and its strong antioxidant activity is considered as the main contributor to several health benefits. Cultivar type, place of production, harvesting time and other factors could affect antioxidant capacities and total phenolic contents of teas. The objectives of the research are to determine the total amount of antioxidants, evaluate their ability to reduce the potential of free radicals, and thus the amount of oxidative stress, analyzing different types of tea available in Latvian retail.

**Materials and Methods.** The research was carried out at certified Laboratory of Biochemistry of Rīga Stradiņš University. The antioxidant activities of aqueous extracts (infusions) of 11 teas, including 4 black teas, 2 green teas, 2 oolong teas, 1 white tea, 1 karkade red tea, and 1 blue pea tea were evaluated using DPPH method and ferric-reducing antioxidant power (FRAP), and their total phenolic contents (TPC) were determined by the Folin–Ciocalteu method.

**Results.** Among 11 selected samples, the highest values in total phenolic content (630.4 GSE mg/L), ability of antioxidants to bind DPPH radical (885 TEAC  $\mu\text{mol/L}$ ) and reduce  $\text{Fe}^{3+}$  ions (5.17 mmol of  $\text{Fe}^{2+}/\text{L}$ ) were obtained for basilur milk oolong tea, while the lowest values were determined for blue pea tea - 207.1 GSE mg/L, 522 TEAC  $\mu\text{mol/L}$  and 1.51 mmol of  $\text{Fe}^{2+}/\text{L}$ , respectively. The radical scavenging ability determined with DPPH showed a moderate correlation with total polyphenol content showed with a coefficient of 0.69, while FRAP showed strong correlation with total phenol content with a coefficient of 0.83.

**Conclusions.** The total content of phenolic compounds, antioxidant and antiradical activity differ among tea varieties available in Latvian retail. Total polyphenol status and antioxidant activity were determined to be the highest for basilur milk oolong tea.

## STRESS AND RESILIENCE AMONG MEDICAL GRADUATES DURING COVID-19 PANDEMIC

Author: *Ananya Yashawanth*<sup>1</sup>

Scientific research supervisors: Assist. Prof. Dr. *Smitha M C*<sup>1</sup>,  
Assist. Prof. Dr. *Shivananda Manohar J*<sup>1</sup>, Dr. *Jose Jom Thomas*<sup>1</sup>, Dr. *Rithvik Kashyap*<sup>1</sup>

<sup>1</sup> *JSS Medical College, JSS Academy of Higher Education and Research, Mysuru, Karnataka*

**Keywords.** Resilience, Stress, Medical graduates, Pandemic, COVID-19.

**Objectives.** Medical training for doctors, a profession dedicated for the caring of patients can at times be detrimental to an individual's health. 'Stress' is an unpleasant feeling or strain because of external demand. When compared to general public, a medical student's satisfaction in life and mental well-being is definitely compromised. Thus, this study is conducted to assess the stress and resilience among medical graduates during Covid-19 pandemic.

**Materials and Methods.** A cross-sectional study was conducted among 235 Medical students using a structured pre-validated standard online questionnaire. Data obtained was entered in Microsoft excel and analysed using SPSS V.24.

**Results.** The median score of perceived stress among the respondents was 21 (18-24). The median resilience score among the participants was 25 (20-29). Statistically significant association was seen between presence of siblings and stress level ( $p < 0.05$ ). None of the single child respondents showed higher stress level while 2.1% of the others showed higher stress level. Females showed a higher proportion low resilience (28.6%) compared to males (19.3%). The urban residents had a higher proportion of respondents with low resilience (25.6%) compared to rural residents (20.8%). A comparison was done between the stress level and resilience score of the study respondents. A higher resilience with median score of 27 (IQR: 22-31.5) was observed among respondents with a lower stress level. The median score of resilience among respondents with higher stress level was 23 (19-27). This difference was statistically significant with Mann-Whitney U test ( $p$  value of  $< 0.001$ ).

**Conclusions.** In the study, majority of the students (58.3%) had higher stress levels and 48% had low resilience. Hence, medical education should not only cater to the academic needs of the students, but also prepare them to cope during the stressful situations which are implicit to this profession.

## ERGONOMIC EVALUATION OF FACE MASKS: A PILOT STUDY

Authors: *Ēriks Vidžups*<sup>1</sup>, *Ilona Jansone*<sup>1</sup>, *Rūta Kauce*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Jeļena Reste*<sup>1</sup>, *Darja Kaļūznaja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Face masks, ergonomics, Covid-19, thermography.

**Objectives.** The aim of this study was to compare ergonomic parameters of medical face masks and face mask prototypes made by the Riga Technical university (RTU), through the evaluation of average skin surface temperature changes and subjective discomfort on face area to provide recommendations for changes of masks functional properties.

**Materials and Methods.** Thermographic measurements of the face skin surface were performed for 15 people before and after 20-minutes long mental work. 9 participants wore medical masks and 6 participants – RTU prototypes of masks. Additionally, a survey about face mask model, material, comfort, sweating and rubbing was conducted. For measurements, high resolution medical digital infrared camera ICI ETI 7320 Pro was used. Data statistical analysis was performed by IBM SPSS Statistics 26

**Results.** The average skin surface temperature before wearing a medical face mask was  $27.98 \pm 0.82^\circ\text{C}$ , before the mask prototype –  $27.54 \pm 1.31^\circ\text{C}$  and did not differ significantly ( $p=0.556$ ). After wearing medical mask, the skin surface temperature increased till  $28.59 \pm 0.72^\circ\text{C}$ , while after prototype it increased much more notably till  $29.26 \pm 0.41^\circ\text{C}$  ( $p=0.099$ ). The difference still was not statistically significant due to the small number of participants.

According to the survey results, medical masks for many respondents were inconvenient and caused severe sweating. Additionally, it was hard to breath in medical masks. On the other hand, RTU mask prototypes did not cause severe sweating and discomfort on eyes due to exhaled air, but respondents noted that prototype fabric was very dense. The most uncomfortable place for both masks was under the eyes.

**Conclusions.** The construction of mask prototypes is more comfortable for wearing, but leads to greater increase of the skin surface temperature, which can cause discomfort and skin problems, wherefore it would need some improvements in the choice of materials.



## EFFECT OF PSYCHOSOCIAL FACTORS ON THE ACCEPTANCE OF COVID-19 RESTRICTION MEASURES

Author: *Santiago Celorio*<sup>1</sup>

Scientific research supervisor: Prof. *Laura Edith Pérez Laborde*<sup>1</sup>

<sup>1</sup> *National Autonomous University of Mexico, Mexico*

**Keywords.** COVID-19, restriction measures, Psychology, Social Psychology, Health Psychology.

**Objectives.** One of the major challenges of the COVID-19 pandemic is the implementation of restriction measures with a positive social reception. Diverse groups around the world have strongly demonstrated against these measures arguing a violation of individual freedom. This research investigates the relation between transgression of COVID-19 restrictions and psychological and social factors (Reactance, Impulse control, Health Belief Model, Groupthink, among others). Moreover, it aims to identify the most difficult measures to comply with and explores solutions to improve social reception.

**Materials and Methods.** An anonymous quantitative online survey with 199 participants from 13 countries (predominantly Mexico, Scotland and Germany) was conducted. The survey consisted of 49 questions (numeric, multiple choice and six- and ten-point scale) divided into: (1) sociodemographic data, (2) psychosocial tendencies, and (3) behavior and attitudes towards COVID-19. Perceived transgressions in the last six weeks and perceived responsibility during the pandemic were measured. This quantitative analysis identifies statistically significant correlations and subsequently, causal relations through linear regressions. Additionally, mean comparisons between groups were performed.

**Results.** Distrust in government, Distrust in society, Reactance, Conspiracy theories, Contact with COVID risk groups, Age and Perceived internal severity correlated with the dependent variables. Impulse control and Attitude towards health risk behaviors showed the strongest causal relation with transgressive and irresponsible behavior ( $p < .01$ ). Mexico scored the highest means in the group comparison. Social-related restrictions were transgressed the most.

**Conclusions.** Advanced research about the effect of psychological factors, especially Impulse control and Attitude towards risk behaviors, should be conducted. Countries with high levels of corruption present lower infrastructure against pandemics and higher levels of Distrust in government, which correlate positively with transgressive and irresponsible behavior. Public Health communication implying active instead of passive participation is suggested, as well as non-prohibitive health promotion campaigns focused on alternatives for health risk behaviors.

## THE TWELVE MONTHS OVERVIEW OF PM<sub>10</sub> CONCENTRATIONS LEVELS IN RĪGA CITY

Authors: *Rūta Kauce*<sup>1</sup>, *Signe Zutere*<sup>1</sup>

Scientific research supervisors: Assist. Prof. Dr.med. *Žanna Martinsone*<sup>1</sup>,  
Mg.sc.sal. *Darja Kaļučnaja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** PM<sub>10</sub>, Rīga, air monitoring, concentration, environment, particles.

**Objectives.** The aim of the study was to analyse fine particulate matter (PM<sub>10</sub>) concentration in two different places in Rīga and find the association between PM<sub>10</sub> concentration level and season of the year.

**Materials and Methods.** Data collection from Environment Administration of Riga City Council Housing and Environment Department regarding two stations: Rīga City Council air monitoring station on 32 Kantora Street and LEGMC air monitoring station on Kronvalda Bulvāris 4 and temperatures from Accuweather.com. Comparing data with Regulations of the Cabinet of Ministers No.1290 maximum allowed daily dose of PM<sub>10</sub> (50 µg/m<sup>3</sup>) Study was supported by RSU Vertical Integrated project (VIP).

**Results.** During this year, the amount of PM<sub>10</sub> was over the norm in 16 days – 9 in Kronvalda Bulvāris and 10 in Kantora Street. The highest concentration of PM<sub>10</sub> was in Kantora Street on 2.10.2020 which was 108,5 50 µg/m<sup>3</sup>, but in Kronvalda Bulvāris the highest amount was 83,6 µg/m<sup>3</sup> on 27.03.2020. In Kronvalda Bulvāris in September the amount of PM<sub>10</sub> particles was more than 50 µg/m<sup>3</sup> for 5 consecutive days. In Kantora Street in October there were 3 consecutive days with PM<sub>10</sub> above 50 µg/m<sup>3</sup>. Divided by weeks, the week with the highest average PM<sub>10</sub> in Kantora Street was from 28.09.2020 till 04.10.2020 (62,84µg/m<sup>3</sup>) but in Kronvalda Bulvāris from 23.03.2020. till 29.03.2020 (49,46µg/m<sup>3</sup>), for both stations the week with the second highest amount of PM<sub>10</sub> was from 21.09.2020 till 27.09.2020. 44% PM<sub>10</sub> concentration exceeded the norm during weekends (7 weekend days of 16 total days).

**Conclusions.** PM<sub>10</sub> was over 50 µg/m<sup>3</sup> in 16 days, from which in 3 days PM<sub>10</sub> was over the norm at both stations. 44% of PM<sub>10</sub> increase over the norm occurred during weekend. The temperature's decrease did not increase the amount of PM<sub>10</sub> in the air(near stations)

## CHEMICAL AND PHYSICAL POLLUTION OF INDOOR AIR QUALITY IN THE OFFICE RECENTLY BUILT BUILDING

Authors: *Marta Fjodorova*<sup>1</sup>, *Buka Bērziņa*<sup>1</sup>

Scientific research supervisor: Assist. Prof. Dr.med. *Žanna Martinsons*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Indoor air quality, chemical pollution, physical pollution.

**Objectives.** Office employees complain about air quality in the recently built building. The aim was to identify indoor air quality, its influencing factors and sources of pollution.

**Materials and Methods.** The data were collected within one week from 30 November to 6 December 2020. The microclimate assessment was performed during working hours, with active ventilation and people working. Chromatography was used to analyse chemical pollutants. CO<sub>2</sub>, temperature and humidity were analysed with “Aranet” monitoring loggers. Data were analysed according to rules No. 359 and World Health Organization. Data was evaluated using Word Excel and IBM SPSS Statistic 26.0. Study was supported by RSU Vertical Integrated project (VIP).

**Results.** Indoor air quality does not exceed the permissible levels according to acquired air chemical composition and CO<sub>2</sub> readings. The concentration of dust particles obtained was low and did not exceed the background levels for offices' premises. Although the air exchange was good, air velocity was low - 0.01 m/s (recommended value: 0.05 – 0.15 m/s). Also, humidity was lower, with average readings of 24% and 29% in weekdays and holidays respectively (recommended values: 40 - 60%).

**Conclusions.** Insufficient air velocity and humidity could be the main factors that can cause employees complaints. The chemical pollutant results of indoor air indicate well ventilated rooms. To optimize the microclimate, it is recommended to make adjustments to the ventilation system to maintain 800 ppm CO<sub>2</sub> instead of 500 – 600 ppm. This ensures both a good CO<sub>2</sub> and higher humidity concentration, as the humidity would not be removed so intensively. Thus reducing ventilation effectiveness would not increase chemical pollution, as it is significantly below the recommended values. Possible sources of chemical pollution – printers with toner, cleaning products, perfumes and hand disinfectants.

## COVID-19 STATE OF EMERGENCY AS A CONTRIBUTING FACTOR TO OVERALL SLEEP QUALITY OF ADOLESCENTS AND ADULTS IN LATVIA

Author: *Samanta Marija Misiņa*<sup>1</sup>

Scientific research supervisor: Dr. *Nikita Bezbordovs*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Sleep, Pittsburgh Sleep Quality Index, Covid-19.

**Objectives.** To evaluate the impact of Covid-19 state of emergency on overall sleep quality of adolescents and adults in Latvia.

**Materials and Methods.** A cross sectional survey of Latvian general public members was carried out from March to April, 2018 and from December, 2020 to January, 2021. The results were compared. The survey included basic sociodemographic characteristics and a questionnaire based on Pittsburgh Sleep Quality Index as a measurement tool of overall sleep quality. 762 citizens of Latvia aged 10 to 61 (average age, 30) took part in the survey. Approval of Ethics Committee of Rīga Stradiņš University (Nr. 6-1/12/32 26.11.2020.) was acquired.

**Results.** 710 responses were found eligible for statistical analysis. Results showed statistically significant decrease of PSQI during Covid-19 state of emergency ( $p < 0.05$ ). Average value of PSQI was 5.50 in 2018 indicating sleep disturbances and poor sleep quality and 4.50 in 2020 which is considered normal sleep quality. The decrease of PSQI was statistically significant among adolescents aged 13 – 18 ( $p < 0.05$ ) and adult women aged 25 – 55 ( $p < 0.05$ ) during Covid-19 state of emergency. The amount of sleeping hours increased by half an hour during Covid-19 state of emergency, which could be a major contributing factor to the decrease of PSQI. In 2021 survey 9% of all respondents reported very poor sleep quality and 9% of all respondents noted significant difficulties keeping enthusiasm to get things done, which was not significantly different from the results of 2018 survey.

**Conclusions.** Sleep quality among adolescents and adult women has significantly improved during Covid-19 state of emergency. A high percentage of subjective poor sleepers and low everyday enthusiasm among all respondents was observed, which requires further investigation as a possible indicator for other mental health difficulties (e.g., depression).

## WRIST HYPOTHERMIA RELATED TO CONTINUOUS WORK WITH A COMPUTER MOUSE

Authors: *Aleksandra Grigorjeva*<sup>1</sup>, *Anete Grūbe*<sup>1</sup>  
Scientific research supervisor: Dr. med. *Jeļena Roste*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Ergonomics, computer mouse pad, skin temperature, thermography.

**Objectives.** The aim of this study was to determine the temperature changes of the wrist skin for volunteers who have been working on a computer with various computer mouse pads for continuous time. Working with computer mouse for prolonged time periods causes microcirculation changes in the arm, resulting in hypothermia. Using ergonomic computer mouse pad could minimize the risk of temperature changes during work with computer mouse.

**Materials and Methods.** 4 volunteers with their occupation involving working with a computer for at least four hours a day were selected. Volunteers were asked to work on a computer for 3 hours using the same type of computer mouse. Skin surface temperature of the right wrist was measured every 15 minutes for 3 hours by high resolution medical digital infrared camera (ICI ETI 7320 Pro) in standard environmental conditions. The measurement was repeated in every study participant for 4 times on different days changing one of the mouse pad types each time (Uppo, Wrist Donut, Duopad, and Standard mouse pad). Data statistical analysis was done by IMB SPSS Statistics 26 program.

**Results.** The mean skin surface temperature differed between the participants ( $p < 0.001$ ). A moderate negative correlation of wrist temperature with time was observed while using Uppo mouse pad (Spearman's correlation coefficient  $r_s = -0.486$ ,  $p < 0.01$ ), Wrist Donut mouse pad (Spearman's correlation coefficient  $r_s = -0.533$ ,  $p < 0.01$ ) and Duopad mouse pad (Spearman's correlation coefficient  $r_s = -0.442$ ,  $p < 0.01$ ). A weak negative correlation of wrist temperature with time was observed while using the standard mouse pad (Spearman's correlation coefficient  $r_s = -0.318$ ,  $p < 0.05$ ).

**Conclusions.** The design of computer mouse pad has an effect on wrist temperature during prolonged work. A more prominent temperature decline was observed when using the Uppo, Donut and Duopad mouse pad. Further investigations on wrist skin temperature changes are needed.

## VITAMIN D IN LATVIAN PREGNANT WOMEN

Authors: **Roberta Rezgale**<sup>1</sup>, **Agnija Irkle**<sup>1</sup>, **Liene Gundare**<sup>1</sup>

Scientific research supervisors: Asoc. Prof. **Laila Meija**<sup>1,2</sup>, Mg. phys. **Vinita Cauce**<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Vitamin D, pregnancy, BMI (body mass index).

**Objectives.** Vitamin D insufficiency and deficiency during pregnancy is associated with a higher risk for adverse health effects for both mother and child. Overweight and obese women have a higher vitamin D insufficiency risk. The aim of this study was to analyse vitamin D status in Latvian pregnant women.

**Materials and Methods.** The study has been implemented within the frame of the project LZP Nr. lzp-2019/1-0335 funded by Latvian Council of Science. A cross-sectional survey of 258 women with singleton birth until 7th day post-partum. Data was obtained using questionnaire and medical documentation from July until October. BMI was classified according to WHO recommendations. Since specific reference values regarding blood vitamin D levels in pregnancy are missing, recommended values for general population were used (vitamin D insufficiency cut-off values <30ng/mL, <40ng/mL or <50ng/mL). Blood samples were taken for measuring serum vitamin D 25(OH) level. Data was analysed using IBM SPSS 26.0.

**Results.** The mean blood vitamin D level was 31.5 (SD 12.9), min 8.0 and max 69.6 ng/mL. All together 5.8% (n=15) of women were underweight (BMI <18.5 kg/m<sup>2</sup>). Normal BMI (18.5-24.9 kg/m<sup>2</sup>) was assessed in 66.3% (n=171). Overweight women (BMI 25.0-29.9 kg/m<sup>2</sup>) were 17.8% (n=46) and obese (BMI ≥30 kg/m<sup>2</sup>) were 7.4% (n=19). Negative correlation between BMI and blood vitamin D level was found (r=-0.161, p<0.01). There was no statistically significant difference between Vitamin D level in different BMI classes and in summer and autumn seasons. Vitamin D level <30ng/mL was found in 50.8% (n=131) of women, <40ng/mL in 61.7% (n=173), >50% in 10.9% (n=28).

**Conclusions.** Vitamin D insufficiency is prevalent in Latvian pregnant women. To evaluate vitamin D intake from food and supplements as well as assessing vitamin D levels in all seasons further studies are needed.

## ASSESSMENT OF ATTITUDE TOWARDS COVID-19 VACCINATION AMONG LATVIAN SOCIETY

Author: *Katrīna Tomiņa*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Ingus Skadiņš*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19, vaccination.

**Objectives.** COVID-19 caused by SARS-CoV-2 has lately become the most topical viral disease. Due to its rapid spread and globally felt consequences, scientists have applied great effort to develop a vaccine - an effective prophylaxis method. The aim of this study was to assess the current attitude towards the COVID-19 vaccination among Latvian society before the initiation of the vaccination program.

**Materials and Methods.** An anonymous online survey was distributed among Latvian people at the end of 2020. The results were collected and statistically analyzed by IBM SPSS.

**Results.** Overall, 3519 responses were recorded from respondents aged 13-98 years, of whom 83.7% (n=2947) were women, 16.3% (n=572) were men. 46.6% (n=1639) of them answered that they did not plan on receiving the vaccine against SARS-CoV-2. 50.6% (n=1780) of respondents denied willingness to pay for this vaccine. 41.9-44.2% (n=1475-1557) of respondents would not recommend COVID-19 vaccination to their family and friends (accordingly: with and without cost). 49.9% (n=1757) of them would not want to vaccinate their children. Despite 79.0% (n=2779) of all respondents admitting that they have experienced the consequences of the COVID-19 pandemic in their daily lives, 42.9% (n=1511) of them felt that the vaccine would not protect from similar consequences in the future. The safety concerns, including short- and long-term side effects of the vaccine, as well as its efficiency were the chief concerns among respondents. Additionally, 22.7% (n=800) of respondents admitted to not believing in the COVID-19 caused pandemic. Generally, there was a statistically significant association ( $p < 0.05$ ) between health care workers and students versus the rest of the society.

**Conclusions.** An alarmingly huge part of society, almost half of the surveyed respondents, were against COVID-19 vaccination regardless of cost. There is evidence for the need to educate society about vaccination as a prophylaxis method to reduce the spread of this harmful but potentially preventable disease.

## USE OF PRESCRIPTION STIMULANTS TO IMPROVE ACADEMICAL PERFORMANCE AMONG LATVIAN STUDENTS: PREVALENCE AND ASSOCIATIONS OF USE

Authors: *Emīlija Reimane*<sup>1</sup>, *Linda Ločmele*<sup>1</sup>

Scientific research supervisor: Dr. *Sandis Kovaļovs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Prescription stimulants, Academic performance.

**Objectives.** Prescription stimulant drugs are mainly used for treatment of attention deficit and hyperactivity disorder (ADHD) and narcolepsy. Recent studies done in other countries have shown increased use of prescription stimulant drugs among students to improve their academic performance. Knowing potential harm of misuse of these medications, it is important to know about situation in Latvia. The main objective of the study was to determine self-reported use of stimulant medications for improvement of academic performance among students in Latvia.

**Materials and Methods.** Survey data were collected from students of 24 different higher education institutions in Latvia and later analyzed using IBM SPSS.

**Results.** Out of 565 respondents, 83% (N=470) have used some kind of stimulant substances to improve academic performance with most popular being coffee 73% (N=411), tea 45% (N=256) and energy drinks 40% (N=224). Meanwhile, 6% (N=34) have used prescription stimulant medications for this purpose – 3% (N=17) methylphenidate, 2% (N=11) dextroamphetamine-amphetamine, but 1% (N=8) modafinil. Improved concentration 85% (N=29) and ability to stay awake longer 56% (N=19) were mentioned as the main goals for use of prescription stimulants. Only 12% (N=4) of these students had stimulant medications prescribed to treat ADHD, while the most commonly reported source of these medications were other friends or family members with diagnosed ADHD (32%, N=11). Most students used them once per semester (32%, N=11). There was significant association between regular tobacco smoking (16%, N=91) and prescription stimulant use ( $p < 0.05$ ), and between reported at least once in a lifetime narcotic drug use (9%, N=51) and use of prescription stimulants ( $p < 0.05$ ).

**Conclusions.** Results were consistent with studies done in other countries. Most students who reported use of prescription stimulants for improvement of academic performance did not have diagnosed ADHD and have obtained these medications through their friends or relatives. It is important to educate the public about possible consequences of prescription stimulant misuse and also to continue such studies between different population groups.



## OPINION ON ORGAN DONATION AMONG LATVIAN STUDENTS

Authors: *Edgars Ķiecis*<sup>1</sup>, *Aija Tumova*<sup>1</sup>

Scientific research supervisors: Dr. *Aleksandrs Maļcevs*<sup>1,2</sup>, Assist. Prof. *Andris Skride*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Organ procurement and donation, informed consent, transplantation, legislation.

**Objectives.** Organ transplantation has become a common lifesaving procedure. However, the gap between the number of patients waiting for a transplant and the number of patients who actually receive a transplant is increasing each year. In addition, high refusal rates from the family to allow organ recovery from a deceased family member represent a major limitation in the process of organ donation in Latvia. In case of any contradiction between the wishes of the deceased and the family, the decision of the latter is usually respected. Consequently, the aim of this study was to determine Latvian students' opinion and knowledge on organ donation.

**Materials and Methods.** An anonymous 21 question survey was carried out among Latvian students on organ donation. The obtained data was statistically analysed using IBM SPSS.

**Results.** In total, 857 responses were received of whom 73.6% (N=631) were women and 26.4% (N=226) were men. The majority of respondents (92.5%; N=793) had not signed informed consent for organ donation after death. Nevertheless, 61% (N=523) of participants were in favor of signing the informed consent upon receiving driver's license. An overwhelming 79.5% (N=681) would be willing to donate their organs in case of their death to a stranger. In addition, 83.9% (N=719) admitted to not having enough information and knowledge regarding donation and transplantation in Latvia. The majority of respondents (93.8%; N=804) agreed that significant increase in promotional campaigns on organ donation and transplantation should be carried out with the help of mass media and professionals in the field of healthcare.

**Conclusions.** Our study shows that the attitude of Latvian students towards organ donation is positive. The majority of students lack knowledge on the topic and support developing promotional campaigns and measures in order to improve the general population's attitude towards donation in Latvia.

## X-RAY USAGE HABITS AND KNOWLEDGE REGARDING THE SAFETY OF RADIOLOGICAL INVESTIGATIONS OF THE POPULATION OF LATVIA

Authors: *Dīna Reitere*<sup>1</sup>, *Anastasija Kraveca*<sup>1</sup>, *Elvijs Ošs*<sup>1</sup>

Scientific research supervisor: Dr. *Ize Skuja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Diagnostic radiography, radiation safety.

**Objectives.** Diagnostic radiography is one of the most used imaging techniques in primary care in Latvia. However, it is associated with certain health risks caused by ionising radiation. The aim of this study was to determine whether the Latvian people are informed about the practical applicability and safety regarding commonly used radiological investigations, and to clarify their habits towards an X-ray examination.

**Materials and Methods.** An online survey was conducted and made available for completion in October of 2020 in two languages – Latvian and Russian. This study included 317 adults: 88% (279) female, 12% (38) male. 80.5% (255) filled the survey in Latvian, and the remainder – in Russian.

**Results.** The percentage of people who thought that Ultrasound, X-ray, Computed Tomography and Magnetic Resonance Imaging was associated with ionising radiation was 14.8%, 88.0%, 57.1% and 51.4%, respectively. Only 30.6% (97) believed that ionising radiation is especially harmful to children under 6 years of age. 12.6% (40) of respondents had gone in for chest X-rays without a referral. Characteristic factors of people doing chest X-rays without a referral were Russian language ( $p < 0.000$ ), age over 40 ( $p = 0.018$ ) and current unemployment ( $p = 0.022$ ). 2.9% (9) had a chest X-ray without a referral performed for their underage children; 6 of these children were older than 12 years, 3 were younger than 12 years of age at the time of these parent-initiated X-rays. Most common complaints for deciding to do a chest X-ray without a referral were cough (37%), troublesome sputum (16%), fatigue (16%) and increased body temperature (12%).

**Conclusions.** The Latvian people are poorly informed about the safety and risks associated with certain radiological investigations, especially their effect on children. People are willing and able to do chest X-rays without a referral not only for themselves, but also for their underage offspring.

## IONIZING RADIATION LATE- ONSET EFFECTS AND CHRONIC KIDNEY DISEASE

Author: *Krista Cēbere*<sup>1</sup>

Scientific research supervisor: Dr. *Marija Burčeņa*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Ionizing radiation, chronic kidney disease.

**Objectives.** More than 30 years have passed since the CNPP accident, it is now possible to analyze the late-onset effects of radioactive exposure. Over 6000 people from Latvia were sent to Chernobyl from 1986 to 1991 to participate in CNPP clean-up works. During this time, the workers were exposed to both external and internal irradiation (<sup>132</sup>Te, <sup>132</sup>Cs, and <sup>137</sup>Cs) varying, with certain exclusions, from 10.0 to 100.0 mSv. In atomic bomb survivors, radiation dose is also associated with increased hypertension incidence, suggesting that radiation dose may be associated with chronic kidney disease. Radiation nephropathy is due to cellular injury caused by ionizing radiation. All components of the kidney are affected, including the glomeruli, blood vessels, tubular epithelium, and interstitium.

**Materials and Methods.** The retrospective study included the analysis of medical documentation (medical history, serum creatinine, radiological studies, specialist consultations) of CNPP clean-up workers who received either inpatient or ambulatory treatment at Pauls Stradiņš Clinical University Hospital Center of Occupational and Radiological Medicine from 2016 to 2021. The incidence and prevalence of kidney disease and significant comorbidities in Chernobyl patients was determined. Data analysis was performed using IBM SPSS Statistics 22 and MS Excel.

**Results.** Only 51% of Latvian CNPP clean-up workers had a known registered radiation dose, median 110.0 mSv. Radiation dose average registered in patients with neoplasms in 1986 was 155.0 mSV and it was statistically significantly higher ( $p > 0.001$ ) than in those who were in Chernobyl from 1987 to 1991.

**Conclusions.** Ionizing radiation affects kidney function and part of the effect of radiation is because of cardiovascular health. Frequent stone formation may be a sign of decreased kidney function and may also increase the risk of kidney failure.

## EARLY INTEGRATION OF ADJUNCTIVE PALLIATIVE CARE ALONGSIDE REGULAR CHEMOTHERAPY IN BREAST CANCER PATIENTS

Authors: *Snehal Bathe*<sup>1</sup>, *Sai Prasad*<sup>1</sup>, *Jangala Sai Vihar*<sup>1</sup>,  
*Adithya Mohan*<sup>1</sup>, *Amlina Priyadarshini*<sup>1</sup>

Scientific research supervisor: Prof. *Tilak TVSVGK*<sup>1</sup>

<sup>1</sup> *Armed Forces Medical College, India*

**Keywords.** Palliative Care, Cancer, Quality of Life, Symptom burden.

**Objectives.** To investigate whether adjunctive Palliative Care improves patient outcomes in Quality of Life and Symptom Management among breast cancer patients undergoing chemotherapy.

**Materials and Methods.** Adult female Stage 3 breast cancer patients (n=50) were recruited from two treatment programs: Group A (n=25): - Received Chemotherapy only; - Recruited from the oncology department of a tertiary care centre. Group B (n=25) - Received Chemotherapy and adjunctive Palliative Care; - Recruited from a Palliative Care centre. All patients were chosen with similar gender, stage of cancer, chemotherapy regimen (standard), socioeconomic status and geographic location.

Quality of Life was measured using EQ- 5D tool (Mobility, Self-care, Usual activities, Pain, Anxiety/depression). Symptom burden was assessed using Edmonton Symptom Assessment Scale (ESAS) (Pain, Tiredness, Nausea, Depression, Anxiety, Drowsiness, Appetite, Well-being, Shortness of breath). Data was analysed using SPSS (USA) 23.0.

**Results.** Age: - Group A (mean)= 51.63, SD = 6.36. Group B (mean)= 49.7, SD = 8.55. Hence, statistically insignificant group differences in patient age.

EQ5D scores: Group A (mean) = 16.33, SD = 4.84; Group B (mean) = 21.77, SD = 2.38.  $t(27) = 2.1, p = 0.003$ . Difference in EQ5D scores is statistically significant, p values were significant for the following domains – Self Care, Usual activities, Pain/discomfort, Depression.

ESAS scores: Group A (mean) = 44.58, SD = 15.30; Group B (mean) = 22.67, SD = 11.22.  $t(36) = 2.09, p = 0.0005$ . Difference in ESAS scores is statistically significant, p values were significant – Pain, Tiredness, Depression, Anxiety, Appetite and Well-being.

**Conclusions.** Our study demonstrates that patient outcomes significantly improved in patients with stage 3 breast cancer when they received concurrent palliative care alongside standard oncologic care, compared to their counterparts who did not receive adjunctive palliative care.

## 12 MONTH ASSESSMENT OF THE LEVEL OF FINE PARTICULATE MATTER POLLUTION IN RĪGA CENTRE AND PĀRDAUGAVA

Authors: *Signe Zutere*<sup>1</sup>, *Rūta Kauce*<sup>1</sup>

Scientific research supervisors: Assist. Prof. Dr. med. *Žanna Martinsons*<sup>1</sup>,  
Mg.sc.sal. *Darja Kaļūznaja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** PM<sub>2,5</sub>, domestic heating, pollution, permissible value, concentration level.

**Objectives.** The aim of the study was to analyse fine particulate matter (PM<sub>2,5</sub>) concentration in two different places in Rīga and find the association between PM<sub>2,5</sub> concentration level and season of the year.

**Materials and Methods.** Study analysed PM<sub>2,5</sub> concentration from air quality monitoring stations in Kronvalda Boulevard and 32 Kantora street during 12 - month period (01.12.2019-30.11.2020). Data were provided by Latvian Environment, Geology and Meteorology Center and Rīga City Council Housing and Environmental Department (Environmental Administration). Data were analysed according to Regulations of the Cabinet of Ministers No.1290. Study was supported by RSU Vertical Integrated project (VIP).

**Results.** Results show that in general 23 days in the 12 - month period were above the permissible value, from which 11 days were in Kantora street and 12 days in Kronvalda Boulevard. From these 23 days, 13 days were on weekends and 10 days were on workdays. There was a difference between the stations, 5 days in Kantora street were above permissible value in weekends and 8 days it was in Kronvalda Boulevard. The highest level of the concentration (>25µg/m<sup>3</sup>) in both stations was at the end of March, 2020. Lower, but still high PM<sub>2,5</sub> concentration was in end of September, 2020 - 22.12µg/m<sup>3</sup> in Kronvalda Boulevard station and 20.13µg/m<sup>3</sup> in Kantora street station. Starting from January 1st, 2020 permissible value is 20 µg/m<sup>3</sup>. Above this value were 36 days in general, 19 days in Kantora street and 17 days in Kronvalda Boulevard.

**Conclusions.** In the 12 - month period 23 days are above the permissible value - 25µg/m<sup>3</sup>, furthermore mostly in the autumn (5 days in Kantora street and 5 days in Kronvalda Boulevard). Highest level of fine particulate matter concentration was determined in late spring (13th week of 2020 of the period) when there was unusually low air temperature.

## ASSESSMENT OF SUICIDE RISK FACTORS IN THE ADOLESCENT-YOUNG ADULT AGE GROUP AND THE IMPACT OF THE COVID-19 PANDEMIC ON MENTAL HEALTH

Authors: *Emilija Kavaliaskaitė*<sup>1</sup>, *Austėja Kindurytė*<sup>1</sup>

Scientific research supervisor: Dr. *Marius Karnickas*<sup>2</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Republican Vilnius Psychiatric Hospital, Lithuania*

**Keywords.** Suicide; adolescent; young adult; Covid-19; mental health; risk factors.

**Objectives.** Suicide is one of the leading causes of death in the adolescence and young adult age group worldwide. Mental health outcomes are influenced by a variety of socioeconomic factors (COVID-19 may be one of them). The more risk factors are affected, the greater the potential impact on their mental health. Aim of the study is to investigate suicide risk factors in the adolescent - young adult age group and the impact of the Covid-19 pandemic on mental health.

**Materials and Methods.** An anonymous questionnaire survey was conducted in 2020. The general population was surveyed, the selection criteria was a group of adolescents-young adults aged 15-35 years. The study involved 191 participants. The results were compared with a similar study we conducted on suicide risk in 2015 which involved 332 respondents. Statistical data analysis was performed using MS Excel and IBM SPSS Statistics 24.0. A statistically significant correlation was considered when the p value < 0,05.

**Results.** From 191 respondents, majority (64,4%) consider suicide to be an unjustifiable option while woman justify suicide more often than man ( $p = 0,015$ ). 36,6% respondents have thought about suicide more than one time and 19,8% from those who had suicidal thoughts have tried to commit suicide. Compared to the results of our pre-pandemic study in 2015, only 19,3% have thought about suicide more than once and 9,6% have attempted suicide. Smokers think about suicide ( $p = 0,02$ ) and try to kill themselves more often ( $p = 0,005$ ). Those who had experienced suicide in their close environment tried to commit suicide more often ( $p = 0,001$ ). More than half of those surveyed (66,4%) were in poorer emotional and mental condition during the COVID-19 pandemic and 73,7% predict that the number of suicides will increase during pandemic and quarantine restrictions.

**Conclusions.** While most respondents from adolescent - young adult age group consider suicide an unjustifiable option, a third think about the possibility of suicide. There is an increase in suicidal ideation and suicide attempts compared to the period before the COVID-19 pandemic. Smoking and suicide in the immediate environment remain among the most important risk factors. The impact of COVID-19 pandemic and quarantine restrictions on mental health was more frequent depressed mood, feeling of hopelessness. Respondents tended to believe that the number of suicides would increase due to current pandemic situation and constraints.

## KNOWLEDGE ON SEXUAL HEALTH AMONG YOUNG ADULTS IN LATVIA

Author: *Līva Auziņa*<sup>1</sup>

Scientific research supervisor: Dr. *Dainis Balodis*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Sexual health; knowledge; young adults.

**Objectives.** The data from The Centre for Disease Prevention and Control has shown that in the recent years, at least 60% of newly discovered cases of chlamydia were in the age group 18 - 29 . The information from the Latvian Health Care Statistics Yearbook shows that in 2018, the proportion of medical abortions has been the highest in the age group 25-29. These statistics raise questions on young people's knowledge of sexual health. The aim of this study is to evaluate the level of sexual education among young adults in Latvia.

**Materials and Methods.** Originally developed questionnaire was created and distributed from November 2020 till December 2020. The survey consisted of 32 questions based on medical facts, which were divided into three blocks: contraception, sexual health, and personal opinions. The data was analysed in Microsoft Excel and IBM SPSS.

**Results.** 176 people participated in the study, mean age 19,4 (SD +/-1,3). Of these, 84.7% were women (N=149). On average, 67% of the questions were answered correctly, no statistically significant difference was observed between men's and women's knowledge. The data showed that as the age of the respondents increased, their knowledge increased by 1.4% ( $p = 0.014$ ). Respondents who considered that their knowledge was at a high level showed 4.8% better results ( $p = 0.002$ ) than others. Young adults who studied in health promoting schools showed 3,4 % ( $p=0.046$ ) less knowledge than those who did not. Although this is contrary to the goals set by the program, these findings could be influenced by parameters such as school size and location, which were not considered in this study.

**Conclusions.** The study found that the sexual health education of young adults surveyed is incomplete -67%. Participants from health promoting schools showed 3,4% lower results, this factor should be investigated further to evaluate the impact of the program.

## TENSION IN STERNOCLEIDOMASTOID MUSCLE DEPENDING ON THE POSITION OF THE MONITOR AT DIFFERENT ANGLES

Authors: *Nadīna Rīmere*<sup>1</sup>, *Simona Rubine*<sup>1</sup>, *Alise Guļājeva*<sup>1</sup>

Scientific research supervisors: Dr. med. *Jeļena Reste*<sup>1</sup>, Dr. *Zane Zundāne*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Ergonomics, monitor position, sternocleidomastoid muscle.

**Objectives.** The aim of the study is to evaluate how the posture of the head affects sternocleidomastoid muscle (SCMM) tension and clarify the optimal angle for the placement of the computer monitor. Pathogenetically, too much tension in SCMM can cause the development of head and neck pain, dizziness, and fatigue. The wrong positioning of the screen might be related to these complaints in employees.

**Materials and Methods.** A quantitative, cross-sectional study was performed in healthy participants (N=41, males N=19, females N=22; mean age – 25 years). Measurements of SCMM tension, decrement, stiffness, and relaxation were obtained by MyotonPro 5.0.0 in the sitting position. The change of head position occurred in the sagittal plane. Data were analysed by IBM SPSS Statistics version 23.

**Results.** The highest frequency value was at an angle of +60° (17.5Hz; 95% CI (17.0; 18.1)), the lowest – at -30° (12.3Hz; 95% CI (12.1; 12.5)). The highest decrement value was at -60° (1.5; 95% CI (1.5; 1.6)), the lowest – at +60° (1.1; 95% CI (1.08; 1.14)). There was no correlation between tension and dominant arm. There was a positive correlation between tension and angle ( $p < 0.001$ , Spearman's  $r_s = 0.76$ ), between angle and stiffness ( $p < 0.001$ ,  $r_s = 0.646$ ). There was a negative correlation between angle and decrement ( $p < 0.001$ ,  $r_s = 0.68$ ), between angle and relaxation time ( $p < 0.001$ ,  $r_s = 0.80$ ), and between BMI and tension ( $p = 0.02$ ,  $r_s = 0.12$ ).

**Conclusions.** The maximal SCMM tension was at +60°, whereas the minimal – at -30°, which corresponds with information about normal SCMM physiology and biomechanics. Selection of the head angle to work with the screen should be guided by the minimum muscle tension (i.e. 0 to 30), but to be sure within the angle, a study with extensor muscle tension measurements should be continued.



## EFFECT OF ANTI-FATIGUE MATS ON MUSCLE TENSION IN LOWER BACK AND LEGS

Authors: *Jānis Verners Birnbaums*<sup>1</sup>, *Monta Blumberga*<sup>1</sup>, *Laura Gelderiņa*<sup>1</sup>

Scientific research supervisor: Dr. med. *Jeļena Reste*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Ergonomic, anti-fatigue mat, muscle tension, sEMG, standing.

**Objectives.** The aim of this study was to compare muscle tension of the lower leg muscle (m.gastrocnemius) and lower back muscle (m.erector spinae) when standing on the anti-fatigue mat and floor in flat shoes.

**Materials and Methods.** Ten young and healthy volunteers participated in the study. Participants have been given a task to stand still on the floor and then on an anti-fatigue mat for 10 minutes each while typing text on the computer placed on the standing desk. Muscle tension was measured for 1 minute during every task. Muscles tested were lumbar part of m.erector spinae and m.gastrocnemius caput laterale bilaterally. Testing was made by surface electromyography with wireless electrodes (BTS FREEMG 1000, BTS Bioengineering), and manufacturer-provided signal processing computer program. 10-second section was cut out and analyzed by Microsoft Excel and the SPSS statistics 26 program.

**Results.** The higher voltage in the muscles was observed while standing on the anti-fatigue mat. The effect was more prominent in tested leg muscles. Right gastrocnemius muscle tension median on the floor was 19.20 $\mu$ V (interquartile range Q1-Q3 was 11.18–39.54), but on the mat it was 37.13 $\mu$ V (16.59–42.83). Right erector spinal muscle tension median on the floor was 8.38 $\mu$ V (5.73–12.95), but on the mat it was 9.52 $\mu$ V (8.85–22.26). Statistical significance was found between standing conditions in left erector spinal muscle ( $p=0.013$ ); right erector spinal muscle ( $p=0.007$ ); left lateral gastrocnemius ( $p=0.009$ ) and right lateral gastrocnemius ( $p=0.005$ ).

**Conclusions.** The study confirmed that the leg muscles responded more to the mat, but the back muscles reacted less. There was a tendency that muscle tension on anti-fatigue mat was higher than on the floor, that might be explained with micromovements to balance on soft surface. To prove this the number of measurements must be increased.

## FACE PERSONAL PROTECTIVE EQUIPMENT(PPE) USAGE AGAINST COVID-19: HABITS AND USER FEEDBACK

Authors: *Elza Gulbe*<sup>1</sup>, *Jana Kitoka*<sup>1</sup>

Scientific research supervisor: Dr. med. *Jelena Reste*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Personal protective equipment (PPE), face mask, COVID-19.

**Objectives.** The research aims to find out the face PPE usage habits and the user feedback in Latvia during COVID-19 pandemic to potentially improve face PPE wearing effectiveness in the future.

**Materials and Methods.** An anonymous survey was conducted to gather data about face PPE usage habits in the form of an Internet survey in Latvian. The data analysis was done by MS Excel program.

**Results.** A total of 414 people aged 10-69 took part in this survey (74.88% women, 23.91% men). Most of them (70.05%) were 20-29 years old, 26.39% studied/worked in the health and social care sector. Most popular face PPEs were surgical (41.98%) or fabric (38.90%) face masks. Most people said they were very satisfied (63.53%) with their face PPE, but common areas of complaint were around the mouth (severe sweating - 37.92%) and behind the ears (severe chafing/compression - 27.05%). 40.10% of people also felt discomfort in their eyes due to exhaled air. 58.78% noted facial skin problems such as acne and drier or oilier skin. 22.59% of respondents changed their disposable mask every few hours, but only 8.21% of respondents said that they changed their mask if it becomes visibly dirty/wet. 60.80% stored their face PPE in a bag/pocket without an extra plastic bag.

**Conclusions.** Surgical or fabric face masks are the most used in Latvian society for protection against COVID-19 infection. Respondents mostly were satisfied with the convenience of their face PPEs. Since there were notable complaints about face PPE usage associated discomfort and cases of face PPE misuse, it is necessary to improve the design of face PPEs and educate society about proper face PPE usage.

## THE IMPACT OF THE COVID-19 PANDEMIC ON THE REGULARITY OF PHYSICAL ACTIVITIES AND MENTAL HEALTH IN LATVIAN POPULATION

Author: *Kalvis Kaļva*<sup>1</sup>

Scientific research supervisors: Dr. *Toms Jānis Eglītis*<sup>1</sup>, Prof. *Oskars Kalējs*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19, physical activities, mental health.

**Objectives.** The COVID-19 pandemic has had a significant impact on people's ability to regularly engage in physical activity all around the world. It is important to clarify the habits of individuals' physical activities to predict the level of public health at the end of the pandemic. The aim of this research was to determine the frequency of physical activities of Latvian citizens and to evaluate their mental health.

**Materials and Methods.** Prospective study was conducted among citizens of Latvia who filled an anonymous electronic survey about their physical activities and Patient Health Questionnaire (PHQ-9) to evaluate their mental health during COVID-19 pandemic from April 2020 till January 2021. Data were analysed with SPSS 23 (Chi-Square test and Kruskal Wallis Test).

**Results.** In research participated 400 citizens of Latvia: 260 women (65.0%) and 140 men (35.0%) with average age 28.8 years (SD 11.8 years). 92 (23.0%) of study participants increased their physical activity, 186 (46.5%) decreased, but 122 (33.5%) people continued to be physically active as before the pandemic. No symptoms of depression were found in 127 (31.8%) study participants of which 53 (43.4%) continued to engage in physical activities as before the pandemic, 46 (36.2%) decreased, but 28 (22.0%) increased their physical activity. There was a statistically significant difference between groups ( $P=0.009$  CI 95%). People who do irregular physical activity have the greatest risk (PHQ-9 = 11.4 points) of developing depression compared with those who do regular physical activities more than 4 times a week (PHQ-9 = 4.58 points) ( $P<0.001$ ).

**Conclusions.** More than one-third of study participants who have reduced their physical activity experience depression from mild to severe form. It is necessary to look for further ways to encourage people to take part in regular physical activity in pandemic conditions to maintain a satisfactory level of Latvia society mental health.

## SELF-ESTEEM OF ELDERLY PEOPLE USING ROSENBERG'S SCALE IN RELATION TO VARIOUS BIOPSYCHOSOCIAL FACTORS

Authors: *Ugne Vaiciulyte*<sup>1</sup>, *Emilija Visinskyte*<sup>1</sup>, *Rolanda Valčiukaitė*<sup>1</sup>

Scientific research supervisor: Prof. *Janina Tutkuvienė*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Elderly people, self-esteem.

**Objectives.** The confidence in one's value and ability play a significant part in a person's quality of life. A high self-esteem ensures better quality of life. However, the self-esteem of our senior citizens is rarely a concern as they are not the main target of social media and television. Therefore, very little is known about this subject. The aim of the study was to evaluate the self-esteem of elderly people in Lithuania and its relation to various factors.

**Materials and Methods.** The investigation was carried out in hospices and leisure centers for senior citizens. A total of 245 elderly people were interviewed. The self-esteem of respondents was evaluated using the Rosenberg's scale (1965), which shows positive and negative feeling about self. Participants also answered questions about health, habits, social relations, housing. Statistical analysis was done using Microsoft Excel 2010, R Commander. Differences in results were considered statistically significant at  $p < 0.05$ .

**Results.** The age of investigated subjects ranged from 64 to 99 ( $M=77$ ;  $SD+/-8$ ). A total of 146 (59,6%) respondents answered questions related to Rosenberg's scale. A total of 99 (40,4%) seniors found the questions too complicated to understand. The median of evaluation was 19/30 points. Participants were sorted into three self-esteem categories based on their answers to Rosenberg's scale. In total, 80,1% fell into the median self-esteem group (15-25 points). Participants who lived in social housing, had no close relations with other, smoked, had poor health and appearance evaluation had lower self-esteem ( $p < 0,05$ ).

**Conclusions.** The majority of participants fell into the mean range of Rosenberg's self-esteem scale. Lower self-esteem in the elderly was mostly associated with poor close social relationships, negative assessment of health status and appearance. However, it is necessary to clarify the causal hierarchical relationships of the above-mentioned factors.

## CHANGES OF HOUSEHOLD INCOME AND ITS EFFECT ON SATISFACTION WITH SEX LIFE DURING COVID-19 PANDEMIC IN LATVIA

Authors: *Marta Laura Graviņa*<sup>1</sup>, *Ieva Pitkēviča*<sup>1</sup>, *Darja Mihailova*<sup>1</sup>

Scientific research supervisors: Prof. *Gunta Lazdāne*<sup>1</sup>, Dr. *Ieva Briedīte*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19, sexual satisfaction, household income.

**Objectives.** Since March 2020 COVID-19 restrictions were implemented in Latvia, which affected daily life and the socioeconomic situation. The study aims to find out the effect of income and income changes during COVID-19 pandemic on satisfaction with sex life.

**Materials and Methods.** A cross-sectional online survey was conducted from July 26 to September 3. This study was a part of the International Sexual Health and Reproductive Health Survey (I-SHARE) realized in Latvia as a component of the National Research Programme project “Impact of COVID-19 on health care system and public health in Latvia; ways in preparing health sector for future epidemics” (Nr. VPP-COVID-2020/1-0011). Data were summarized and analyzed using MS Excel and IBM SPSS Statistics 26.0

**Results.** We analyzed answers of 966 women and 205 male responders from 18 to 68 years of age living in Latvia. More than a half (53.9%) of all responders who rated their economic situation one year before COVID-19 as “low income” were not satisfied with their sex life, in contrast to 7.7% in the “high income” group ( $p=0.001$ ). Half of women who rated their economic situation as “low” before COVID-19 pandemic were not satisfied with their sex life, meanwhile all women who rated their economic situation as “high” were satisfied with their sex life ( $p=0.025$ ). Influence of income before COVID-19 with sex life satisfaction in men was not statistically significant. COVID-19 has resulted in decrease of satisfaction with sex life and frequency of engagement into sexual activities, however, no statistical difference was noted of the influence of the changes of household economic situation due to COVID-19 neither in women nor in men.

**Conclusions.** Income influences sexual life satisfaction especially in women. Decrease of income due to COVID-19 pandemic in Latvia did not statistically significantly influenced satisfaction with sex life.

## ASSESSMENT OF PM<sub>1</sub> POLLUTION LEVEL IN DIFFERENT PARTS OF IMANTA DISTRICT IN RĪGA

Authors: *Anda Veikšāne*<sup>1</sup>, *Valērija Ignatjeva*<sup>1</sup>, *Signe Zutere*<sup>1</sup>, *Rūta Kauce*<sup>1</sup>

Scientific research supervisors: Assist. Prof. Dr. med. *Žanna Martinsone*<sup>1</sup>,  
Asoc. Prof. *Ivars Vanadzīņš*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** PM<sub>1</sub>, outdoor air pollution, air quality, particle matter, household heating, urban.

**Objectives.** The aim of study was to determine the number of particles (PM<sub>1</sub> - Particulate Matter, diameter <1 μm) in different parts of Imanta district in Rīga.

**Materials and Methods.** In the study measurements of PM<sub>1</sub> were made using „P-Trak Ultrafine Particle Counter” Model 8525. Humidity, temperature, and the speed of wind were also assessed. Measurements were made 3 times a day for 7 days (in the morning from 9-11AM, afternoon 2-4 pm and evening 6-8 pm) in 4 different locations; Anniņmuižas park, private house district (Šķērsiela), intensive traffic junction (Slokas and Kurzemes prospekt) and in the courtyard of an apartment building (Kleistu Street). Study was supported by Rīga Stradiņš University Vertical Integrated project (VIP).

**Results.** The main results include: Out of all 4 locations the highest level of PM<sub>1</sub> were found in intensive traffic junction, where PM<sub>1</sub> on average was 26213 particles/cm<sup>3</sup>, followed by private house district of PM<sub>1</sub> 8866 pt/cm<sup>3</sup>, then courtyard of an apartment building where PM<sub>1</sub> on average was 7465 pt/cm<sup>3</sup> and park with an average PM<sub>1</sub> 6664 pt/cm. Park was less polluted on weekends compared to week days. Pollution in courtyard of an apartment building didn't change much on weekends compared to weekdays. Private house district was less polluted on weekends than weekdays and intensive traffic junction had increased pollution on Saturday compared to other days

**Conclusions.** PM<sub>1</sub> pollution was higher in private house district compared to an apartment building with central heating. PM<sub>1</sub> increased by 1401 pt/cm<sup>3</sup> on average in private house district compared to apartment courtyard.

## SELF-ASSESSMENT OF THE IMPACT OF COVID-19 PANDEMIC ON THE NUTRITION DURING PREGNANCY

Authors: *Katrīna Stašinska*<sup>1</sup>, *Marita Kalvane*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Laila Meija*<sup>1</sup>, Mg. phys. *Vinita Cauce*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19 pandemic, nutrition, pregnancy.

**Objectives.** Most of the women change their lifestyle during pregnancy. The COVID-19 pandemic has had a big impression on everyday's life, including a diet that is very important for mothers and fetus health, in 2020. This research aimed to evaluate the self-assessment of COVID-19 pandemic impact on nutrition change in pregnant women.

**Materials and Methods.** The study has been implemented within the frame of the project LZP Nr. lzp-2019/1-0335 funded by Latvian Council of Science. A cross-sectional survey of 287 postpartum women from July of 2020 till November of 2020 in 8 maternity centres all around Latvia had done. Data used for analysis were taken from the questionnaire and included questions about nutrition during pregnancy and COVID-19 pandemic impact on dietary habits during pregnancy. Data were analysed using chi-squared tests. The analysis had performed using IBM SPSS Statistics version 22.

**Results.** The mean age of respondents was 31.4 (SD 5.5) years, the mean body mass index (BMI) - 23.7 (SD 6.1) kg/m<sup>2</sup>. 177 (61.7%) mentioned that COVID-19 had not an impact on their diet during pregnancy, 110 (38.3%) - affected dietary habits. 70 (64.2%), had increased their frequency of meals; 33 (30.3%) had - the same frequency, 6 (5.5%) - decreased. Changes were statistically significant ( $p=0.003$ ). There has been statistical significance in education level on COVID-19 impact on nutrition ( $p=0.036$ ). There has not been found statistical significance ( $p>0.005$ ) in COVID-19 role in single portion size; marital status, nationality, BMI impact on nutrition in COVID-19.

**Conclusions.** This research shows that women nutrition during pregnancy has been affected by COVID-19 increasing the meal frequency notably but has not influenced a single portion size. The education level has an impact on nutrition during COVID-19 pandemic. The study should be investigated further to strengthen the Conclusions. and to discover other connections.

## ASSESSMENT OF RESPIRABLE PARTICLES (PM<sub>1</sub>) AS INDOOR AIR POLLUTION INDICATOR IN WORKPLACES IN RĪGA

Author: *Signe Dātava*<sup>1</sup>

Scientific research supervisor: Assist. Prof. Dr. med. *Žanna Martinsone*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** PM<sub>1</sub>, concentration level, pollution, workplace.

**Objectives.** Indoor air quality relates to the health and comfort of building occupants. Health effects may be experienced soon after exposure or years later. Understanding and controlling common indoor pollutants can help reduce the risk of health concerns. The aim of the study was to determine the number of particles (PM<sub>1</sub> - Particulate Matter, diameter <1 μm) in different workplaces in Rīga.

**Materials and Methods.** Measurements of PM<sub>1</sub> were made using „P-Trak Ultrafine Particle Counter” Model 8525. Measurements were made in 3 buildings located in 3 different districts in Rīga: museum (Kuzemes district), financial sector company (Centre of Rīga) and information technology (IT) company (Industrial district of Rīga). Workplaces were both open and closed type, also storage rooms. In all 3 buildings were sufficient ventilation systems, the museum had specific ventilation with 2 different systems (for office and storage). Study was supported by RSU Vertical Integrated project (VIP).

**Results.** Results show that the lowest concentration in the museum was found in the storage room (282 parts/cm<sup>3</sup>) and highest in different storage (1890 parts/cm<sup>3</sup>). Also this room was used as storage, but does not meet the requirements, because it was intended as an office. Lowest concentration in a financial sector company was found in an open type office (1980 parts/cm<sup>3</sup>), but highest in the printing room (154000 parts/cm<sup>3</sup>). Lowest concentration observed in IT company was at noon, rather than in the morning (1339 parts/cm<sup>3</sup>), the same was with highest, which was observed at noon only in different zone (23875 parts/cm<sup>3</sup>). Evaluating data in all 3 districts, the highest indoor concentrations were obtained in the industrial district.

**Conclusions.** The highest level of PM<sub>1</sub> number concentration was found in indoor air in an industrial district. Particle concentration in museum work offices was quite low, that indicates an efficient ventilation system regarding specific storage requirements.



## SLEEPING HABITS AND PSYCHOLOGICAL DISTRESS IN MEDICAL STUDENTS

Author: *Mihails Šatcs*<sup>1</sup>

Scientific research supervisor: Dr. biol. *Artūrs Papatde*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Psychological distress, Medical students, Sleeping habits.

**Objectives.** Medical students are prone to high stress and pressure due to intense medical studies. This can cause the formation of unhealthy sleeping habits, which can affect students' wellbeing. The aim of study was to evaluate the linkage between sleeping habits and psychological distress.

**Materials and Methods.** In total participated 168 medical students and residents from Rīga Stradiņš University (RSU). The survey included the Kessler (K-10) test, questionnaire on participants individual sleeping habits, such as an average sleeping duration, bedtime, awakening time, alarm usage and sleep connected habit regularity.

**Results.** There was no significant correlation between psychological distress test results and bedtime, waking time or the sleep connected habit regularity. The usage of an alarm did not have significant effect on the psychological distress results either between both groups. The weak negative correlation ( $r = -0.235$ ;  $p = 0.02$ ,  $N=168$ ) was found between average sleeping duration and psychological distress result. The group sleeping 4-5 hours (G<sub>1</sub>) did not have any significant differences with the group sleeping 6-7 hours (G<sub>2</sub>) (G<sub>1</sub> = 34(31;41) vs. G<sub>2</sub> = 34(26;39) ;  $p = 0.204$ ). However, there was significant differences between group sleeping 8-9 hours (G<sub>3</sub>) and group 4-5 hour (G<sub>1</sub>) (G<sub>1</sub>=34(31;41) vs. G<sub>3</sub>=28(22;35);  $p = 0.006$ ) and group 6-7 hour (G<sub>2</sub>) (G<sub>2</sub> =34(26;39) vs. G<sub>3</sub>=28(22;35);  $p = 0.027$ ).

**Conclusions.** Sleeping habits as bedtime, awakening time, as well as sleep connected habit regularity, did not have significant relationship with medical student Kessler's test score. Usage of an alarm did not affect Kessler's distress score results. In contrast, an average sleep duration showed an impact on students Kessler's test results. Students sleeping on average 8-9 hours (considered optimal) had a significantly lower distress score comparing to the ones sleeping 4-5 hours or 6-7 hours.

## TRANSEPIDERMAL WATER LOSS IN HANDS DEPENDING ON FREQUENCY OF HAND WASHING AND DISINFECTION

Author: *Toms Jānis Safranovs*<sup>1</sup>

Scientific research supervisor: Assist. Prof. Dr. med. *Žanna Martinsone*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Transepidermal water loss, TEWL, hand disinfection, hand washing, offices.

**Objectives.** The aim of this study was to determine if increasing frequency of hand disinfection and washing also increase transepidermal water loss on palmar hand surface/area.

**Materials and Methods.** In the study were 84 participants and the measurements were made from September 21 till September 30, 2020 in a building with mechanically ventilated rooms. In study was determined following parameters: air humidity (%), air temperature (Co), TEWL (Transepidermal water loss g/cm<sup>2</sup>/sec). Also all participants filled out a survey that was used to determine how many times a day they disinfect and wash their hands, and if they use any hand moisturiser.

**Results.** The main results include: after literature research was found that 0-10 g/cm<sup>2</sup>/sec defines oily skin, 10-15 g/cm<sup>2</sup>/sec defines moist skin, 15-25 g/cm<sup>2</sup>/sec defines common skin, above 25 g/cm<sup>2</sup>/sec defines dry skin. All 84 research participants were divided in three groups based on number of times a day they wash hands and compared against measurements of TEWL levels mentioned before. The analysis of data showed statistical significance ( $p=0.0034$ ) that people who wash their hands more than 6 times per day have dry skin. Also analysis of data showed statistical significance ( $p=0.001$ ) that people who disinfect their hands more than 4 times have dry skin.

**Conclusions.** We have statistical significance which proves that washing and disinfection increase TEWL, in result more people have dry hands. Acknowledgments: The study was done within the frame of Vertical Integrated Project (RSU) and with support by KoTuElpo Ltd.

## BREASTFEEDING PRACTICE AMONG MOTHERS IN LATVIA

Authors: *Anna Piskurjova*<sup>1</sup>, *Olga Aizbalte*<sup>1</sup>, *Ksenija Nikuļcova*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Laila Meija*<sup>1</sup>, Mg. phys. *Vinita Cauce*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia.*

**Keywords.** Breastfeeding promotion, subsequent children breastfeeding.

**Objectives.** Breastfeeding benefits for the mother and the baby physical and emotional well-being. Although most infants are given breast milk for a substantial amount of time, most mothers due to diverse reasons do not follow the global recommendation of six month of exclusive breastfeeding and continued breastfeeding up to the age of two years or beyond. The aim of the present study was to assess the breastfeeding practice among women in Latvia and examine if the duration of breastfeeding meets the WHO recommendations.

**Materials and Methods.** The study has been implemented in 2020 within the frame of the LZP Nr. lzp-2019/1-0335 project funded by Latvian Council of Science. It was a cross-sectional study of 287 pregnant women in 3rd trimester and women with singleton birth until 7th day post-partum. Data was obtained using questionnaire and medical documentation during face-to-face interviews in outpatient clinics and hospitals in various regions of Latvia. Data were analyzed using IBM SPSS 26.0.

**Results.** More than a half or 57.5% (n=165) with mean age of 32.9 (SD 4.6) years were mothers of more than one child. As many as 57.6% (n=95) in this group had higher education. The average income for one family member was 400 EUR (IQR: 300-581). The median duration of breastfeeding of a first child was 9.0 (IQR: 3.0-15.0) month and 10.0 (IQR: 4.5-14.5) month for the second child. A total of 41.8% (n=69) have not reached the minimum recommended goal for at least six months of breastfeeding with the first child and a total of 30.8% (n=20) with the second child.

**Conclusions.** Continuing the research with more incoming participants and investigating causes of findings, the study results can be used for between-country evaluation of breastfeeding duration and may facilitate for the development of breastfeeding promotion strategies in Latvia.

## MEDICATIONS AND DIETARY SUPPLEMENTS PURCHASING AND PROPHYLACTIC CONSUMPTION PREVALENCE AMONG HEALTHY SOCIAL MEDIA PLATFORM USERS IN LATVIA DURING COVID-19 PANDEMIC

Author: *Patrīcija Nemme*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Ingus Skadiņš*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19, prophylactic use, medications and dietary supplements.

**Objectives.** Until December of 2020, public health guidelines have not recommended any medications and dietary supplements for prophylaxis of SARS-CoV-2 infection. This study investigated whether social media platform users in Latvia irrationally purchased and prophylactically consumed medications and dietary supplements during COVID-19 pandemic for general prophylaxis.

**Materials and Methods.** A total of 330 respondents participated in an anonymous online survey, distributed through social media. Respondents were at least 18 years old and living in Latvia and were asked whether they purchased and prophylactically consumed medications during COVID-19 pandemic while being asymptomatic and without diseases requiring treatment. Medications were divided in 4 groups: dietary supplements, homeopathic and herbal remedies (Group I), cough, cold, nasal and throat preparations (Group II), non-prescription anti-inflammatory, analgesics, antipyretics (Group III), antibiotics (Group IV). Statistical analysis was done in IBM SPSS Statistics 26.

**Results.** Group I preparations were purchased by 51.2% (n=169), Group II preparations were purchased by 13.9% (n=46) and Group III preparations were purchased by 30.3% (n=100) of respondents, and in 77.5% (n=131), 13% (n=6) and 3% (n=3) of the cases, respectively, the reason for purchasing was prophylactic use. Almost half of the respondents (47%) consumed Group I preparations prophylactically. Group II preparations and Group III medications were used prophylactically by 5.5% and 1.5% of the respondents, respectively. The proportion of respondents who prophylactically consumed both Group I and Group II preparations was larger than the proportion who consumed preparations from one of the two groups (9.7% vs 1.7%,  $p = 0.001$ ).

**Conclusions.** Although until December of 2020 no guidelines recommended prophylactic consumption of medications and dietary supplements for SARS-CoV-2 infection, healthy individuals remarkably frequently purchased and prophylactically consumed different medication groups and dietary supplements during the COVID-19 pandemic.

## PARENTAL VIEW OF THE USE OF ANTIPIRETTICS IN CHILDREN WITH FEVER

Author: *Evita Kokuša*<sup>1</sup>

Scientific research supervisor: Dr. *Jelizaveta Aleksejeva*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Antipyretics, fever, child.

**Objectives.** Fever is one of the most common disease symptoms in childhood. Often parents themselves take charge of the treatment, especially if the rise of body temperature is small and therapy with antipyretics is not necessary. Aim. To analyse parental views on fever in children.

**Materials and Methods.** An online survey was performed to collect data on parental views in regards of fever, it's symptoms and antipyretics usage. The analysis of gathered data was carried out by IBM SPSS 26, MS Excel.

**Results.** A total of 379 parents (mean age 34 years, SD±6.6 years) were included in this study, 97.4% (n = 369) females and 2.6% (n = 10) males. As fever symptoms most parents considered warmth of skin (90.5%, n=343), chills (81.0%, n=307) and redness of cheeks (62.0%, n=236). Many responders (37.7%) thought that fever is harmful to the human body. Most parents (n=351, 92.6%) used antipyretics to treat fever in children and almost all (95.0%) had sought help with a medical professional. A correlation between parents' thoughts about "fever temperature" and "the time when to give antipyretics" was found (rs=0.217, p<0.001). More than ¾ of parents (76.0%) would give antipyretics to their children starting from 38.0-38.9 °C. Paracetamol or ibuprofen were used in 87.4% of cases, yet it is important to mention that some parents (11.1%) chose inadequate doses or provided alternative treatment methods (2.8%), for example, lemon water feet baths. Before antipyretic treatment, parents ensured -adequate fluid intake and got rid of excess clothing (83.4%).

**Conclusions.** Even though a lot of parents thought that fever is not harmful, most of them still sought help with healthcare professional. Not only body's temperature but also overall condition of the child was a great factor determining fever treatment and indications for antipyretics use.

## SELF-ASSESSMENT OF PHYSICAL AND MENTAL HEALTH DURING THE SARS-COV-2 PANDEMIC IN LATVIAN PREGNANT WOMEN

Authors: *Paula Rudzite*<sup>1</sup>, *Dārta Jakovicka*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Laila Meija*<sup>1,2</sup>, Mg. phys. *Vinita Cauce*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** SARS-CoV-2, Mental health, Physical health, Pregnancy.

**Objectives.** Currently, there is no data available on the physical and mental health changes of pregnant women during the SARS-CoV-2 pandemic in Latvia. The aim was to find out the self-assessment of a woman's physical and mental health in the perinatal period in the context of SARS-CoV-2 pandemic in Latvia.

**Materials and Methods.** Study has been implemented within the framework of the Latvian Council of Sciences project Nr.lzp-2019/1-0335. This cross-sectional study included 34 pregnant women in the third trimester and 253 new mothers until 7th day post-partum in 8 Latvian health care institutions, who consented to participating in a personal interview from July to November in year 2020. Data were analyzed by IBM SPSS.

**Results.** In 60.5% (n=170) of cases women denied the pandemic having impact on their physical activity, in 23.5 % (n=66) took more frequent walks, but in 18.5 % (n=52) reduced physical activity. Medium-intensity 30-minute physical exercises were performed daily or almost daily by 9.9% (n=28) of respondents, while 51.1% (n=145) performed them few times a year or not at all. 73.5% (n = 205) of respondents had a pre-pregnancy body mass index (BMI) of up to 25kg/m<sup>2</sup>, 26.5% (n = 74) of respondents of more than 25 kg/m<sup>2</sup>. Woman's pre-pregnancy BMI was not statistically significant related to self-assessment of their physical and mental health (p> 0.05). In 55.7% (n=141) of cases women denied the pandemic having impact on their mental health, 32.4% (n=82) had health fears, 24.5% (n=62) lacked communication with others, 7.9% (n=19) were sad, and 16.6% (n=42) of women were afraid of the unknown.

**Conclusions.** SARS-CoV-2 pandemic could be an additional subjective risk factor in the physical and mental wellbeing of pregnant women, which will need to be further researched to offer and adapt the support structures for maintaining these aspects of health.

## ASSESSMENT OF COMPLIANCE AND SELF MONITORING IN ARTERIAL HYPERTENSION PATIENTS IN A FAMILY PHYSICIANS PRACTICE

Author: *Telma Amanda Barisa*<sup>1</sup>

Scientific research supervisor: Prof. *Jānis Zaļkalns*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Arterial hypertension, compliance, self-monitoring.

**Objectives.** Lack of patient compliance to therapy and self-monitoring is one of the main reasons for insufficient control of arterial hypertension. The aim of the study was to evaluate patients self-monitoring and identify factors that affect patients compliance to the treatment of hypertension in a family physicians practice in order to improve the effectiveness of the treatment.

**Materials and Methods.** Questionnaire for arterial hypertension patients in the practice of family physicians. IBM SPSS for statistical tests. Chi-Square and McNemar's tests were used for data analysis.

**Results.** 95 patients participated in the study. 80% (76) of patients control arterial blood pressure at home. 55,2% of patients with monthly income of 65-430 € and 87,9% from the group of patients with monthly income >430 € have a blood pressure monitor at home. 95 % (19) of patients with higher education, 81.1% (43) with secondary vocational education, 61.9% (13) with secondary education perform blood pressure monitoring at home. In total 47,4% of patients have stopped using prescribed drugs for hypertension control for a period of time. 62,2% of patients pointed out that the main cause of stopping the medical treatment was improvement of their well-being, 35,6% admitted they have stopped the treatment because of forgetfulness. 36 patients (37,9%) smoked before the diagnosis of hypertension, but after getting diagnosed of having a hypertension only 12 (33%) of them continued smoking.

**Conclusions.** The main factors influencing treatment discontinuation are improvement of patients well-being and forgetfulness. There is a statistically significant association between income level and the presence of a blood pressure monitor at home and the association between education level and blood pressure control at home. The higher the level of education, the more patients are monitoring their blood pressure.

## PATIENT SELF-ASSESSMENT RISK OF MELANOMA ASSOCIATION WITH THEIR ATTITUDE TOWARDS MODIFIABLE RISK FACTORS AND CHECK-UP

Authors: *Valērija Kanuņņikova*<sup>1</sup>, *Elīna Skuja*<sup>1</sup>, *Laine Beķere*<sup>1</sup>

Scientific research supervisor: Dr. *Ilze Skuja*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Melanoma, risk self-assessment, risk factors.

**Objectives.** In Latvia incidence of skin melanoma in 2017 was 11.8 per 100 000. Risk assessment of melanoma includes non-modifiable risk factors (e.g. skin type by Fitzpatrick) and modifiable risk factors (e.g. UV exposure). Patients' compliance and prevention of modifiable risk factors could reduce the incidence of melanoma. The aim of this study was to find out melanoma self-assessment risk and knowledge about possible risk factors in patients.

**Materials and Methods.** This study includes adults from different GP practices in Latvia. Participants completed a questionnaire, that was made based on a melanoma risk assessment tools. Participants were divided into two groups, those who assessed their risk as low (LR) and medium to high (HR). Data was analyzed using IBM SPSS.

**Results.** This study included 91 participants (33 men) with the mean age of  $60.7 \pm 16.5$ . The mean age of LR group is 64.5, HR group 55.0. A statistically significantly higher number of respondents rated their risk higher after completing the questionnaire, which listed risk factors of melanoma ( $p < 0.01$ ). HR group reported to use sunscreen more frequently (56%) than LR group (34%). HR group performs skin self-examination and uses sunbeds more often ( $p < 0.05$ ). There is no significant difference between two groups considering their desire for GP to perform dermoscopy and skin examination or participants' choice to be checked by dermatologist primarily. Likert scale analysis LR and HR group responses are as following: concerns of developing melanoma ( $2.7 \pm 1.5$ ;  $3.9 \pm 1.3$ ), desire for GP to perform visual skin examination ( $3.7 \pm 1.6$ ;  $4.3 \pm 1.0$ ) and requesting a refer to a dermatologist ( $3.5 \pm 1.5$ ;  $4.2 \pm 1.2$ ).

**Conclusions.** This study indicates that there is a lack of knowledge about risk factors of melanoma in general population. Young people rate their personal risk higher than older people. Although there is no significant difference in habits of both groups.



# OPHTHALMOLOGY

## PREECLAMPSIA INDUCED RETINAL MANIFESTATIONS

Authors: *Mantile Juotkute*<sup>1</sup>, *Deimante Uzkuraityte*<sup>1</sup>, *Dovile Karaliute*<sup>1</sup>

Scientific research supervisor: Dr. *Vaida Makarevičienė*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Medical Academy, Lithuania*

<sup>2</sup>*Lithuanian University of Health Sciences Kaunas Hospital, Lithuania*

**Keywords.** Retina, preeclampsia, pregnancy, retinopathy, retinal detachment.

**Objectives.** One of the most common manifestations of preeclampsia are the retinal changes. High blood pressure damages the retinal vessels and induces vision impairment. Furthermore, there is an opinion that retinal changes indirectly indicate placental vascularization. Ergo, the aim of our overview is to find out how preeclampsia affects retina and to evaluate the most commonly described ocular conditions.

**Materials and Methods.** A systematic literature overview of articles on the retinal manifestations during preeclampsia was conducted via the free full-text archive PubMed (Medline). Permission for the study obtained from LUHS Bioethics center no. BEC – MF – 105.

**Results.** Visible retinal changes affect 40 to 100 percent of preeclamptic women. However, only half of them experience clinically significant symptoms. Different publications consent that hypertensive retinopathy is the most commonly occurring retinal manifestation. Meanwhile, retinal detachment and retinal vascular occlusion are rather rare, nevertheless, there is significant proof they might be more serious and could cause acute vision impairments or vision loss if not detected on time. Authors indicate that these changes are usually reversible and require no interventions. However, different studies suggest some conditions might demand urgent treatment and close follow-up monitoring for up to a year after giving birth. Any chosen treatment must be safe for both the mother and the fetus. While the ophthalmologists are in charge of the diagnosis and treatment, some studies suggest that in times the first link to suspect pathological ocular changes could be the obstetricians.

**Conclusion.** Most preeclamptic patients develop visual complications related to retina. Preeclampsia can cause or provoke severe retinal changes. Most of these changes are reversible, however, a possibility of acute vision loss should be taken into consideration at all times. Well-timed diagnostics and treatment of severe and progressive ocular conditions are of great importance.

## FACTORS INFLUENCING THE EFFECTIVENESS OF ANTI-VEGF THERAPY IN AGE-RELATED MACULAR DEGENERATION

Authors: *Renāte Nagobade*<sup>1</sup>, *Sintija Kukaine*<sup>1</sup>, *Agnese Vikmane*<sup>1</sup>

Scientific research supervisors: Prof. *Guna Laganova*<sup>1,2</sup>, Dr. *Artūrs Anss*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Age-related macular degeneration (AMD), anti-VEGF therapy, optical coherence tomography (OCT).

**Objectives.** AMD is one of the leading causes of blindness in older individuals worldwide. There have been identified many individual and environmental risk factors for AMD, but age is by far the strongest one. The aim of the study was to evaluate the change in retinal thickness and visual acuity after the therapy with VEGF-inhibitors in patients of different age.

**Materials and Methods.** This retrospective study took place in Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology from September of 2020 until December of 2020. Adult patients with AMD after anti-VEGF therapy were included in this study. The medical records of patients and OCT reports were analyzed. Obtained data was analyzed using IBM SPSS Statistics Version 26.0 and Microsoft Excel 2016.

**Results.** The study was composed of 20 eyes of 20 patients, among them 14 (70%) were female and 6 (30%) male. The mean age of the patients was 76.4 years  $\pm$  6.5 (SD). The mean number of anti-VEGF injections performed was 16. The mean visual acuity before anti-VEGF injections was 0.21  $\pm$  0.21 (SD) and after injections it was 0.16  $\pm$  0.13 (SD) - with no statistically significant difference ( $p > 0.05$ ). The mean retinal thickness before anti-VEGF injections was 399.4  $\mu\text{m}$   $\pm$  197.2 (SD) and after injections it was 347.2  $\mu\text{m}$   $\pm$  137.1 (SD) - with no statistically significant difference ( $p > 0.05$ ). There was no statistically significant correlation between age of the patient and visual acuity after anti-VEGF therapy ( $r = 0.263$ ,  $p > 0.05$ ). There was no statistically significant correlation between age of the patient and retinal thickness after anti-VEGF therapy ( $r = 0.153$ ,  $p > 0.05$ ).

**Conclusion.** 1. After the anti-VEGF therapy retinal thickness decreased, but visual acuity also decreased. 2. The age of the patients and number of anti-VEGF injections do not correlate with findings in OCT results.

## MORPHOLOGICAL CHANGES IN STRABISMUS AFFECTED EYE MUSCLES

Author: *Vita Knopecka*<sup>1</sup>

Scientific research supervisor: Prof. *Māra Pilmane*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Institute of Anatomy and Anthropology, Rīga Stradiņš University, Latvia*

**Keywords.** Strabismus, eye muscles, myosin, dystrophin, collagen IV.

**Objectives.** Strabismus can cause physical disturbance, binocular vision dysfunction leading to difficulties in everyday life. Eyeball muscles are very complex in development therefore it is very complicated to clarify their morphologic changes. However, changes in eyeball muscles may reveal the strabismus morphopathogenesis. The aim of the study was to evaluate on the distribution and appearance of myosin, dystrophin, collagen IV in strabismus affected human eyeball muscles.

**Materials and Methods.** Ten eye muscle specimens obtained from strabismus patients (aged 7–60 years) during correction surgery were examined. Specimens used for this study were property of the historical collection of Rīga Stradiņš University Institute of Anatomy and Anthropology. Beside the routine staining with haematoxylin and eosin also Biotin-avidin immunohistochemistry (IMH) method was used to detect myosin, dystrophin, collagen IV. Results were evaluated semi-quantitatively. Spearman's rank correlation coefficient was calculated for data evaluation between indices. Friedman's two-way analysis of variance by ranks was used to detect statistically significant differences between IMH markers.

**Results.** Strabismus affected eyeball muscles demonstrated different size and diameter of muscle fibres; newly formed (immature) skeletal striated muscle fibres were noticed in the slides. Muscles demonstrated moderate number of dystrophin and myosin positive fibres with some individual variations where abundance of positive structures were found. Only occasional collagen IV positive fibres were detected. Statistically significant difference was found between collagen IV and myosin [ $p=0.011$ ;  $n=10$ ]; collagen IV and dystrophin [ $p=0.005$ ;  $n=10$ ]. Spearman's rank coefficient revealed very high positive correlation between dystrophin and myosin [ $rs=0.840$ ;  $p=0.002$ ;  $n=10$ ].

**Conclusion.** Strabismus affected eyeball muscles demonstrated different size and diameter of muscle fibres; newly formed (immature) skeletal striated muscle fibres were noticed in the slides. Muscles demonstrated moderate number of dystrophin and myosin positive fibres with some individual variations where abundance of positive structures were found. Only occasional collagen IV positive fibres were detected. Statistically significant difference was found between collagen IV and myosin [ $p=0.011$ ;  $n=10$ ]; collagen IV and dystrophin [ $p=0.005$ ;  $n=10$ ]. Spearman's rank coefficient revealed very high positive correlation between dystrophin and myosin [ $rs=0.840$ ;  $p=0.002$ ;  $n=10$ ].

## ASSOCIATIONS OF MOBILE VIREOUS OPACITIES AFTER ANTI-VEGF INJECTION WITH ULTRASONOGRAPHIC IMAGING IN AGE – RELATED MACULAR DEGENERATION

Author: *Agnese Vikmane*<sup>1</sup>

Scientific research supervisor: Prof. *Guna Laganovska*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Age - related macular degeneration, mobile vitreous opacities, anti-VEGF therapy, eye ultrasonographic imaging.

**Objectives.** The aim of this study was to find out if there is an association among age - related macular degeneration (AMD) patients subjective complaints of obstructed vision and mobile vitreous opacities (MVOs) in front of the eye after intravitreal injection and ultrasonographic imaging.

**Materials and Methods.** This was a retrospective study which included patients with AMD who had received intravitreal injections with VEGF- inhibitors and after injections had ultrasonography. Ultrasonography images were analyzed if whether the opacities occupy more or less than 1/3 of the vitreous body, the results were compared using the subjective complaints of the patients. Data was analyzed using descriptive statistic methods and Microsoft Excel.

**Results.** This study was carried out on 13 patients and 13 eyes. The mean age of patients was  $78,8 \pm 6,1$ (SD) years. 3 patients had slight complaints of obstructed vision, 3 patients had significant complaints of obstructed vision, but in the ultrasonographic imaging MVOs took up less than 1/3 of the vitreous body. 7 patients had had significant complaints of obstructed vision, in the ultrasonography examination the MVOs took up more than 1/3 of the vitreous body.

**Conclusion.** MVOs are common side effects of anti-VEGF therapy, all patients had complaints of obstructed vision and all of them had MVOs in the ultrasonographic imaging, but the complaints differ from patient to patient as 23% had significant complaints, but had MVOs in less than 1/3 of the vitreous body.

## ANTI – VEGF THERAPY EFFICIENCY IN CASE OF DIABETIC MACULOPATHY

Authors: **Ričards Likjančiks**<sup>1</sup>, **Patricija Sproge**<sup>1</sup>

Scientific research supervisor: Prof. **Guna Laganovska**<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Anti-VEGF therapy, diabetes mellitus, diabetic maculopathy, macular edema, vision loss.

**Objectives.** Vision loss due to diabetic maculopathy is a very common complication in patients with diabetes mellitus. Anti-VEGF is a type of therapy that aims to limit the development of edematous process and reduce macular edema. The aim of the study was to analyze the results of anti-VEGF therapy for the reduction of macular edema and to find a correlation between the change in retinal thickness and the change in visual acuity.

**Materials and Methods.** The retrospective study was conducted by reviewing medical records of patients with diabetes mellitus who had undergone anti-VEGF therapy. Information about macular thickness before and after therapy was analyzed and compared using IBM SPSS 25.0.

**Results.** The study included 13 patients and 25 eyes were analyzed. The median age was 67 (38-78). All patients had diabetes mellitus and had received anti-VEGF injections as part of their therapy. The median amount of injections per eye were 10 (3-32). The median central retinal thickness before injections was 441 (239-1161) microns and after injections 298 (105-758) microns. The median visual acuity before and after injections was the same, before injections it was 0.3 (0.2-1.0) and after injections 0.3 (0.1-1.0). There was no statistically significant difference in visual acuity before and after anti-VEGF injections ( $p = 0.099$ ), even though there was a statistically significant difference in central retinal thickness before and after the therapy ( $p = 0.000$ )

**Conclusion.** Anti-VEGF therapy does reduce macular edema and decrease its thickness, however visual acuity stays within the same level, thus we can conclude that this therapy helps to maintain patients vision function, however there is no vision function improvement. This may be a reason to encourage frequency and quality of DM patient monitoring, so that treatment can be timely started and would prevent the development of vision loss.

## INTRAOCULAR PRESSURE DYNAMICS IN PATIENTS AFTER IRIS CLIP INTRAOCULAR LENS IMPLANTATION

Authors: **Dita Elīna Sila**<sup>1</sup>, **Monta Riklāne**<sup>1</sup>, **Santa Bigāte**<sup>1</sup>

Scientific research supervisors: Prof. **Guna Laganovska**<sup>1,2</sup>, Dr. **Dairis Meiers**<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Intraocular pressure, iris clip, glaucoma.

**Objectives.** Iris clip is an artificial intraocular lens (IOL), which is used to treat vision disorders like cataract, aphakia, IOL dislocation. It is fixed to the iris through a 5.5 mm surgical incision in the cornea. The aim of surgery is to restore vision and improve quality of life. In this research IOP was measured before and after iris clip implantation in anterior or posterior chamber. Parameters as age, gender, diagnosis of glaucoma were also evaluated as potentially influencing factors of IOP.

**Materials and Methods.** Data of 21 patient (10 men, 11 women) who had iris clip IOL surgery were analyzed. 14 of patients had anterior chamber IOL implantation, 7 posterior IOL implantation. IOP was measured before and 1 month after surgery. 15 patients had diagnosis of glaucoma. IOP of fellow eye were used as control group. Data was analyzed using MS Excel, IMB SPSS 26, Wilcoxon and Mann - Whitney U test.

**Results.** Mean IOP in the eye with IOL dislocation before surgery was  $24.57 \pm 9.41$  (SD) mmHg, 1 month after surgery  $16.62 \pm 6.37$  (SD) mmHg. Mean control group IOP before surgery was  $13.05 \pm 3.25$  (SD) mmHg and 1 month after  $13.4 \pm 3.63$  (SD) mmHg. There was statistically significant difference between IOP before and 1 month after IOL implantation in patients with anterior chamber iris clip implantation ( $p=0.002$ ). There was not found any statistically significant IOP difference in posterior chamber implantation ( $p=0.351$ ). Between genders, there were no statistically significant difference in pressure reduction ( $p = 0.863$ ), also no correlation between age of patient and IOP difference was found. There was no significant change in the intraocular pressure between patients with and without diagnosis of glaucoma ( $p=0.677$ ).

**Conclusion.** 1. IOP is significantly decreased after iris clip intraocular lens implantation in anterior chamber. 2. Gender, age and diagnosis of glaucoma does not significantly affect IOP after surgery.

## COMPARATIVE EVALUATION OF CENTRAL RETINAL VEIN THROMBOSIS USING OCT

Author: *Eva Mediņa*<sup>1</sup>

Scientific research supervisor: Prof. *Guna Laganovska*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Central retinal vein thrombosis, optical coherence tomography, intravitreal injections.

**Objectives.** Retinal vein occlusion (RVO) is the most common retinal vascular disease after diabetic retinopathy, which can cause vision worsening and lead to vision loss. Disturbed venous drainage can induce macular oedema and neovascularization. The aim of the research was to analyze and compare changes in retina in patients with CRVT using OCT before and after intravitreal injections were used.

**Materials and Methods.** 9 patients with CRVT were analyzed using optical coherence tomography (OCT). Central macular thickness was measured with OCT before and after treatment with intravitreal injections and the count of intravitreal injections was taken into consideration. To measure best corrected visual acuity (BCVA) ETDRS chart was used. Data was analyzed using Word Excel and IMB SPSS 22.0, Spearman's rho and Wilcoxon tests were used to analyze statistics.

**Results.** 5 men and 4 women were analyzed. Average age of patients was 71,56 years. Mean central macular thickness at the beginning of thrombosis was 475,11µm (IQR=251,5) and after treatment mean central macular thickness 254,4µm (IQR=116,5) - with statistically significant difference between them ( $p=0,008$ ). Average count of intravitreal injections was 9 (IQR=11). Mean BCVA of the thrombosed eye was 0,39k.n. There was found no statistically significant correlation between intravitreal injection count and BCVA of the same eye ( $r=0,25$ ;  $p=0,53$ ). No statistically significant correlation between intravitreal injection count and central macular thickness ( $r=0,5$ ;  $p=0,17$ ) was found.

**Conclusion.** 1.A trend of bigger intravitreal injection count after CRVT and decreased central macular thickness was noted. 2.Central macular thickness is decreasing after the treatment but can not be associated with better visual acuity. 3.Increased intravitreal injection count can not be associated with better best corrected visual acuity. 4.OCT can be used as diagnostic and prognostic tool for patients with CRVT.

## EYE STRUCTURAL AND FUNCTIONAL PARAMETERS IN PATIENTS WHO WERE DIAGNOSED WITH CHOROIDAL MELANOMA IN 2019 – 2020

Author: *Eva Mediņa*<sup>1</sup>

Scientific research supervisor: Prof. *Guna Laganovska*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Choroidal melanoma, ultrasonography, tumor size, best corrected visual acuity.

**Objectives.** Choroidal melanoma is the most common primary malignant tumor of the eye. It is typically diagnosed late because of the lack of early symptoms. Approximately half of patients go on to develop distant metastases via hematogenous spread. The aim of the research was to analyze the size of the tumor and compare it to the functional parameters of the eye.

**Materials and Methods.** 17 patients with choroidal melanoma were analyzed. The size of melanoma was measured in ultrasonography (USG) examination. To measure best corrected visual acuity (BCVA) ETDRS chart was used. Data was analyzed using Word Excel and IBM SPSS 22.0, Spearman's rho and Fisher's Exact tests were used to analyze statistics.

**Results.** 4 men and 13 women were analyzed. Average age of patients was 65,29 years. Mean tumor size was 34,63mm<sup>2</sup> (IQR=24,03). No statistically significant correlation between age and tumor size was found ( $r=-0,14$ ;  $p=0,59$ ). Mean BCVA was 0,7k.n. No statistically significant correlation between tumor size and BCVA was found ( $r=0,15$ ;  $p>0,05$ ). But there was found an association between tumor size and BCVA.

**Conclusion.** 1. Patients with larger tumor were associated with lower best corrected visual acuity. 2. A trend of the patients age and the size of tumor was noted. 3. There is neither association nor trend between patients age and tumor size. 4. USG can be used as diagnostic and prognostic tool for patients with choroidal melanoma.



## ANALYSIS OF CAUSED OF CORNEAL TRANSPLANTATION: RETROSPECTIVE CHART REVIEW

Authors: *Zane Semjonova*<sup>1</sup>, *Diāna Lavrinoviča*<sup>1</sup>, *Estere Zeltiņa*<sup>1</sup>

Scientific research supervisor: Prof. *Guna Laganova*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Corneal transplantation.

**Objectives.** Corneal transplant surgery is commonly performed for advance corneal diseases. A corneal transplant replaces diseased or scarred corneal tissue with healthy tissue from an organ donor. The aim of this study was to investigate the causes of corneal transplantation in Pauls Stradiņš Clinical University Hospital in the period from January 2018 to December 2019.

**Materials and Methods.** A retrospective study based on analysis of data on inpatient medical records. The study included 68 patients who received a corneal transplant in the period from January 2018 to December 2019. Data were analysed using Microsoft Excel and IBM SPSS Statistics 26.0.

**Results.** The study included 68 medical records of which 66,2% woman and 33,8% men. Mean age was 64,01 (SD 18,4). Left eye corneal transplantation - 51,5 % and right eye corneal transplantation 48,5%. The most frequent transplantation causes were infectious keratitis - 41,1%, bullous keratopathy - 32,4% and trauma - 14,7%. Additional manipulation was used in 23 (33,8%) cases. The most common additional manipulation was lensectomy and IOL implantation in the posterior chamber (47,8%).

**Conclusion.** Our research showed that the main causes of corneal transplantation were infectious keratitis, bullous keratopathy and trauma. Both right and left corneal transplants were in equal amounts.

## LATE RESULTS OF RETINAL DETACHMENT OPERATIONS AFTER LONG – TERM SILICONE OIL TAMPONADE

Author: *Renāte Nagobade*<sup>1</sup>

Scientific research supervisor: Prof. *Guna Laganovska*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Silicone oil (SO), long-term, retinal detachment.

**Objectives.** Although SO may remain in the eye for extended periods of time, its use is generally intended to be temporary, as complications may develop with prolonged intraocular duration. Long-term SO might be unavoidable in a small subgroup of patients with an extremely complicated clinical course. The aim of the study was to evaluate the retinal condition and the visual functions after long-term SO tamponade removal.

**Materials and Methods.** This retrospective study took place in Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology from April of 2017 until December of 2020. Adult patients after retinal detachment operations and long-term SO tamponade were included in this study. The medical records of the patients were analyzed. Obtained data was analyzed using Microsoft Excel 2016 and IBM SPSS Statistics Version 26.0, Wilcoxon Signed Rank Test was used to analyze statistics.

**Results.** The study was composed of 13 eyes of 13 patients, among them 7 (53.8%) were female and 6 (46.2%) male. The mean age of the patients was 53.9 years  $\pm$  17.7 (SD). The minimum age was 20 years, the maximum age was 84 years. The median SO removal time was 36 (IQR 17-83) months. The median visual acuity before SO removal was 0.01 (IQR 0.01-0.04) and after SO removal it was 0.04 (IQR 0.01-0.07) – with statistically significant difference ( $p=0.011$ ). The mean intraocular pressure (IOP) before SO removal was 30.3  $\pm$  12.6 (SD) and after SO removal it was 17.9  $\pm$  0.5 (SD) – with statistically significant difference ( $p=0.005$ ). Reoperations with repeated use of SO were performed in 61.5% of the patients after the median of 1 month (IQR 1-46).

**Conclusion.** 1. After removal of long-term SO tamponade the visual acuity of the patients increased and the IOP normalized. 2. Repeated use of SO tamponade was necessary for 61.5% of the patients.

## CHANGES IN RETINAL NERVE FIBER LAYER THICKNESS IN PATIENTS WITH EARLY AND LATE STAGE GLAUCOMA

Authors: *Viktorija Žuka*<sup>1</sup>, *Jūlija Janceva*<sup>1</sup>, *Marija Pērkone*<sup>1</sup>

Scientific research supervisor: Prof. *Guna Laganovska*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

**Keywords.** Glaucoma; Optical coherence tomography; Retinal nerve fiber layer; Visual fields.

**Objectives.** Glaucoma is a common, progressive disease of the eye that severely damages the optic nerve. Structural damage can be detected before visual field damage by Optical coherence tomography (OCT). The goal was to evaluate the thickness of the retinal nerve fiber layer (RNFL) for early and severe glaucoma (EG/SG) patient groups by using OCT, and to further analyse ISNT rule.

**Materials and Methods.** The authors analysed medical records of glaucoma patients registered at the Pauls Stradiņš Clinical University Hospital for anti-glaucomatous surgery. Patients underwent ophthalmic examinations, including the visual fields using Oculus centerfield perimeter. Heidelberg Spectralis Optical coherence tomography was used to measure the thickness of RNFL in four quadrants – upper (S), lower (I), temporal (T) and nasal (N).

**Results.** 19 glaucoma diagnosed eyes of ten patients with the mean age 71,36(±6,94) were included in the study, divided into two groups by visual field Mean deviation (Md) value. EG group was defined when  $Md > -3$  dB (n=5) and SG when  $MD < -3$  dB (n=14). Statistically significant difference was found in median RNFL between eyes with EG and SG in three quadrants: Quadrant I: EG med 119,50mm and SG med 65mm,  $p < 0,01$ ; in Quadrant S: EG med 125,50mm and SG med 76,25mm,  $p < 0,01$ ; and in Quadrant N: EG med 88,00mm and SG med 51,50mm,  $p < 0,001$ . ISNT rule was present in 10,53%(n=2) of eyes, one in each group. For EG, a tendency that  $T < N < S$  was observed in 80%(n=4) of cases, ISNT violating tendency of I value not being greater than S was identified. For SG,  $T < N < S$  was in 28,57%(n=4) of cases, but there was tendency that  $N < T$  which violates ISNT.

**Conclusion.** RNFL thickness is affected more in severe glaucoma than in early glaucoma group in each quadrant excluding T quadrant. ISNT rule is not confirmed in both groups.

# OTORHINOLARYNGOLOGY, OTORHINOLARYNGOLOGIC SURGERY, DENTISTRY, MAXILLOFACIAL SURGERY

## COVID-19 AND ADAPTATION TO VIRTUAL LEARNING: DENTAL STUDENT'S PERCEPTIONS AND FUTURE DIRECTION

Author: *Mashaal Moazzam*<sup>1</sup>

Scientific research supervisor: Prof. Dr. *Jelena Reste*<sup>1</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Dentistry, COVID-19, Online education, Scoping review.

**Objectives.** The COVID-19 pandemic demanded a quick shift from presential to online learning processes. Unlike planned online learning programs, medical and dental schools have had to quickly deliver the entire medical curriculum using remote strategies. This study aimed to describe dental student's experiences online classes, how this approach affects their skills in clinical practice under the pandemic situation.

**Materials and Methods.** Medline and Web of Science was searched using the following keywords: "Coronavirus Infections" OR "COVID-19" OR "SARS-CoV-2" and "online dental education". The endpoint was students' perceptions of online learning.

**Results.** The scoping review highlighted that virtual learning for dental students can limit clinical experiences of treating the patients, preclinical and laboratory works. Studies suggest that many countries opted to switch to online system and dental clinical practices were cancelled such as in the United States, Switzerland and Japan. In the United States, many students expressed that although the materials provided by professors online were understandable, however they were anxious in application of this knowledge to clinical practices. In Pakistan, Taiwan and Indonesia, studies noted that majority of students preferred to have onsite clinical lessons to gain practical experience. In Japan, some universities have started to reopen the onsite training for students through small groups sessions.

**Conclusions.** The COVID-19 pandemic has had a catalytic effect on the changes in educational processes worldwide. It caused an abrupt shift from face-to-face to online classes without enough time to plan and prepare virtual educational programs. The pandemic situation requires schools to restructure their educational plans for teaching in a virtual environment through a well-integrated trained team to detect students' and teachers' needs. They can support with digital tools and to develop a 'blended curricula', incorporating online and also on-site clinical practice in smaller groups to improve knowledge as well as skills of students.

## ADULT TONSILLECTOMY: A RETROSPECTIVE ANALYSIS OF INDICATIONS AND OUTCOMES.

Authors: *Ksenija Jenbajeva*<sup>1</sup>, *Karoļina Poļikarpova*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Renāta Klagiša*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Tonsillitis, tonsillectomy, adenotonsillectomy.

**Objectives.** According to the data of previous research works, it has been established that the number of acute tonsillectomies in the Clinic of Otolaryngology of P. Stradiņš Clinical University (PSKUS) is four times higher than the number of planned tonsillectomies, the most common indication was infection. The aim of this study is to evaluate risk factors, comorbidities and postoperative complications for tonsillectomy due to infectious indications.

**Materials and Methods.** The retrospective study included a group of 126 patients who has been hospitalized in the clinic of Otorhinolaryngology of PSKUS due to tonsillitis or peritonsillar abscess. Data was analysed using SPSS.

**Results.** In the study participated 56,3% females (n=71), 43,7% males (n=55). Participants were on average 33,27 years old. The planned tonsillectomy was made in 48 patients (37,5%) whereas acute tonsillectomy was made in 72 patients (57,1%). Average time in the hospital was 3,28 days. The symptoms included tonsil hypertrophy in 100 patients (79,4%), erythema of tonsils and pharynx in 82 patients (65,1%), dysphagia in 74 patients (58,7%), febrile temperature in 59 patients (46,8%), trismus in 55 patients (43,7%), adenopathy in 38 patients (30,2%), halitosis in 7 patients (5,6%). Tonsillitis complications such as peritonsillar abscess was presented in 71 patients (56%), parapharyngeal abscess in 11 patients (8,7%), retropharyngeal abscess in 5 patients (4,0%), obstructive sleep apnoea in 5 patients (4,0%). The most often comorbidities were immunological diseases in 5 patients (4,0%), cardiological diseases in 4 patients (3,2%), bronchial asthma in 4 patients (3,2%), hepatitis in 4 patients (3,2%), diabetes mellitus in 3 patients (2,4%). Postoperative complications occurred in 1 (0,8%) case with haemorrhage and in 1 (0,8%) case with pus collections. There is statistically significant difference between tonsillectomy type and hospitalization time (p=0,027).

**Conclusions.** An acute tonsillectomy is still performed more often than planned tonsillectomies and is a risk factor for longer hospitalization time.

## WHEN IS DIFFICULT, TOO DIFFICULT? WHARFE'S ASSESSMENT GRADING REVIEWED – PROPOSAL OF BGOR 4-POINT GRADING SCALE

Author: *Dinesh Kumar AB*<sup>1</sup>

Scientific research supervisor: Prof. *Soumithran CS*<sup>2</sup>

<sup>1</sup> *Government Dental College, Kozhikode, Kerala, India*

**Keywords.** Third molar surgery, Difficult tooth extraction.

**Objectives.** Third molar surgery is one of the most common surgical procedures performed in OMFS specialty. Outcome audit of difficulty is assessed by various predictive models. This study estimates the difficulty outcomes of third molar surgery, assessed using WHARFE model, and grades them into 3 classes based on total time elapsed. A BGOR 4-point scale grading scheme is proposed as an adjunct to further aid planning.

**Materials and Methods.** In this cross-sectional study, 68 patients underwent third molar surgery. WHARFE model was used to assess difficulty outcome on an orthopantomogram tracing. All patients were treated and assessed by the same operator. Statistical analysis was performed in SPSS version 13. Patients' WHARFE score and BGOR 4-point grading scheme was assessed preoperatively, and the total time elapsed after flap elevation till the exit of tooth is recorded in minutes. The cases were stratified into three groups of difficulty as mild (0-5 minutes), moderate (6-15 minutes), and severe ( $\geq 16$  minutes).

**Results.** One-way ANOVA test showed that the differences in mean time elapsed for different grades of WHARFE index were statistically significant, however, when a multiple comparison was done within the groups using Bonferroni comparison, statistically significant difference was achieved only between mild and severe grades. Implying cases with mean score less than 8 in WHARFE were mild or moderately difficult (0-15 minutes) and scores  $\geq 9$  were always difficult ( $\geq 16$  minutes). When cases were planned with codes B or G in the BGOR 4-point grading scale, the total time elapsed was  $< 15$  minutes and codes O or R corresponded to total time elapsed  $> 15$  minutes.

**Conclusions.** The BGOR grading scale is arbitrary plan of tooth removal, but when it is used in adjunct with WHARFE is useful in predicting difficulty. Validation on this model has to still be done with prospective studies.

## INFLUENCE OF UNILATERALLY IMPACTED MAXILLARY CANINES ON MAXILLARY TRANSVERSE DIMENSION

Author: *Ieva Ozola*<sup>1</sup>

Scientific research supervisor: Dr. *Ieva Mauliņa*<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Impacted maxillary canine, maxillary transverse dimension, cone beam computed tomography.

**Objectives.** In European population, the average prevalence of impacted canines is 0,8-8,4 %. Numerous etiological factors are involved in buccal and palatal canine impaction but their exact influence is not completely clear. Although it has been hypothesized that palatally impacted canines often have sufficient space in the dental arch, whereas buccally impacted canines are generally associated with dental or skeletal deficiency, the results of transversal dimension studies are inconclusive. The aim was to determine whether there is a difference in the maxillary transverse dimension between the impacted canine side and the opposite side without canine impaction using cone-beam computed tomography.

**Materials and Methods.** In this retrospective study, 79 cone-beam computed tomography images of patients with unilaterally impacted maxillary canine (58 palatally, 21 buccally) were analyzed. Measurements of the maxillary transverse dimension were performed at dental, alveolar and basal level at the 1st premolar and 1st molar on both sides of the maxilla with a freeware 3D Slicer. Two independent sample t-test and Mann-Whitney U-test were used.

**Results.** No significant differences in the maxillary transverse dimension were found between the impacted canine side and the opposite side without canine impaction in any of the measurements in both palatally and buccally impacted canine group.

**Conclusions.** There is no difference in the maxillary transverse dimension between the impacted canine side and the opposite side without canine impaction. This suggests that the maxillary transverse dimension could not be considered a major factor in the genesis of canine impaction.

## RETROSPECTIVE ANALYSIS OF OUTCOMES IN GERIATRIC PATIENTS WITH SQUAMOUS CELL CARCINOMA OF HEAD AND NECK CANCER

Author: *Dinesh Kumar AB*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Sajith Babu TP*<sup>1</sup>, Prof. *Satheesan B*<sup>1</sup>

<sup>1</sup> *Malabar Cancer Center, Kerala, India*

**Keywords.** Head and neck cancer, geriatric, SCC.

**Objectives.** Head and neck Cancers are one of the most common types of cancer worldwide. Increasing life expectancy and ageing is resulting in a greater proportion of geriatric population presenting with Head and neck cancers. Evidence and data on treatment outcomes of geriatric patients treated with curative intent is scarce. This study audits the treatment results of patients  $\geq 65$  years with curative intent, and evaluates the factors affecting survival in this cohort.

**Materials and Methods.** 69 patients treated over a period of six months (February to August 2012), were reviewed retrospectively. Variables like Age, Gender, Performance status, Habits, Nutritional status, WUHNCI (Washington University Head & Neck Comorbidity Index), Anatomic site, TNM stage, Treatment allocation (Surgery vs no surgery done) were analysed using SPSS 16. Primary endpoint was overall survival. Univariate and multivariate analysis were done using Kaplan Meier method with log rank test and Cox regression respectively.

**Results.** We found the cohort had median follow up of 27 months, and overall survival 28 months. Mortality profile includes 33 patients (48%) who died due to disease, 2 patients died during the treatment (3%), comprising total of 35/69 patients (51%). 34 patients (49%) were alive until last follow up. Radiation therapy completion was not seen in 7 patients (10%) due to radiation toxicity, 2 patients (3%) could not complete due to social issues, 2 patients (3%) died during RT. In this study we found age strata, ECOG performance status, inclusion of surgery in primary treatment as statistically significant factors influencing overall survival. In multivariate analysis, age strata and inclusion of surgery in primary treatment remained statistically significant.

**Conclusions.** Age in itself should not be a sole criterion in deciding the treatment outcomes nor should it be a reason to avoid the inclusion of aged patient for curative surgical therapy.



## STUDENTS AND TEACHERS AWARENESS OF EPISTAXIS

Author: *Jurgita Jurusaite*<sup>1</sup>

Scientific research supervisor: Dr. *Arnoldas Morozas*<sup>2</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Vilnius University Hospital Santaros Klinikos, Lithuania*

**Keywords.** Epistaxis, students, teachers, awareness, first-aid.

**Objectives.** To examine high school teachers' and students' knowledge and behaviour during epistaxis.

**Materials and Methods.** Anonymous surveys executed examining 175 students(S) and 102 teachers(T). Statistical analysis was performed using MSExcel and SPSS23.0 programs, applying the statistical significance level of  $p < 0.05$ .

**Results.** 86% of all students have ever experienced epistaxis. 71% of teachers have ever had a student with epistaxis at school. 35% of teachers and 66% of students believed that epistaxis is not a serious issue. The most commonly indicated epistaxis etiological factor in both groups was injury (S63%, T58%), whereas the least common – medications (S26%, T6%). Students revealed having better etiological knowledge as compared to teachers ( $p < 0.05$ ). 58% of students thought that epistaxis cannot cause any complications. Nasal tamponade was the most commonly indicated treatment way among students (46%), while among teachers (35%) it was electrocautery. 9% of the students and 42% of the teachers did not know any treatment for the illness. Therefore, the knowledge about treatment of epistaxis was statistically significantly better among students than among teachers ( $p < 0.05$ ). At the event of epistaxis, 40% of students would blow their noses and 71% of teachers would apply an ice pack. Only 6% of students and 9% of teachers would perform the right action and would pinch the nose above nostrils. Teachers (39%) more often than students (22%) would bend the head to the front ( $p < 0.05$ ). 8% of students and 3% of teachers would do nothing. In both respondent groups, the most frequent information source is family members (S52%, T41%). 40% of students and 95% of teachers have had first aid training at school. None of students and 7% of teachers were taught about management of epistaxis during these trainings.

**Conclusions.** Epistaxis among school children is common. Students and teachers lack knowledge of appropriate behaviour during epistaxis. Awareness and practices of school students and teachers on first aid during epistaxis need to be improved.

# ORTHOPAEDICS, TRAUMATOLOGY, TRAUMA & ORTHOPEDIC SURGERY, SPORTS MEDICINE, RADIOLOGY

## ESTABLISHMENT OF LOCAL DIAGNOSTIC REFERENCE LEVELS FOR HEAD COMPUTED TOMOGRAPHY EXAMINATIONS IN PAEDIATRIC PATIENTS

Author: *Baiba Ledaine*<sup>1</sup>

Scientific research supervisor: Dr. *Ingus Supe*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Vidzeme Hospital, Institute of Diagnostic Radiology, Latvia*

**Keywords:** Head CT, diagnostic reference level (DRL), paediatric population, ionising radiation.

**Objectives.** CT provides the highest contribution of the total collective radiation dose from all paediatric medical imaging. The increased frequency of paediatric CT examinations and the high radiosensitivity of children entail the need to determine DRLs and optimize CT protocols. The aim of the study was to establish paediatric local diagnostic reference levels (LDRL) according to age for head CT examinations at one regional hospital in Latvia and to compare them with European paediatric dose reference levels (PiDRL).

**Materials and Methods.** A retrospective study included 169 paediatric patients who underwent head CT examination at one regional hospital in Latvia over a period of three consecutive years (2016- 2018). The volume computed tomography dose index (CTDI<sub>vol</sub>) and dose length product (DLP) were quantities for setting LDRLs. LDRLs were based on the 3rd quartile method (the 75th percentile). Statistics were performed on MS Excel 2012.

**Results.** All patients (n = 169) were 1 - 17 years (y) old; male (n=109 (64%)) and female (n=60 (36%)). They were divided into four groups based on their age: 1 - <6y (n = 21), 6 - <10y (n = 24), 10 - <15y (n=53), ≥15y (n=71). LDRL of CTDI<sub>vol</sub> (mGy) were 16.47; 31.74; 32.17; 32.17 accordingly and LDRL of DLP (mGy x cm) were 425.8; 550.55; 886.5; 881.35. European PiDRL of CTDI<sub>vol</sub> (mGy) were 40; 50; 50; 50 and of DLP (mGy x cm) were 505; 650; 650; 650.

**Conclusions.** LDRLs in age group 1 - <10y were in accordance with the European guidelines for diagnostic reference levels for paediatric head CT imaging, but in age group ≥10y LDRLs were higher. A dose management is necessary in age group 10 years and older.

## LONG-TERM RESULTS OF STAGED BILATERAL HIP ARTHROPLASTY

Authors: *Maksims Mihailovs*<sup>1</sup>, *Dārta Jakovicka*<sup>1</sup>, *Vladislavs Janšins*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Pēteris Studers*<sup>1</sup>, Dr. *Justs Sauka*<sup>1</sup>,  
Dr. *Matīss Zolmanis*<sup>2</sup>, Dr. *Una Bladiko*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Hospital of Traumatology and Orthopaedics, Latvia*

**Keywords.** Total hip arthroplasty; staged; bilateral.

**Objectives.** Bilateral total hip replacement is an option for patients suffering from osteoarthritis in both hips with no effective nonsurgical treatment. Question about optimal time interval after first arthroplasty remains unclear. Complications after surgery can extend patient's hospitalization time and result in additional costs for hospital and patient. Aim of study was to discover if there is difference in timing of the second surgery, clinical results and adverse event rate.

**Materials and Methods.** The retrospective analysis of 162 patients (324 primary staged bilateral total hip arthroplasties) was made. All surgeries were performed by 1 senior surgeon (1992-2017) at a single hospital. We calculated months between both arthroplasties for every patient. Analysis of demographics, hospitalization time, transfusion rate, complications was conducted. Patients were split into three groups depending on timing of the second arthroplasty: (1) from 2 weeks to 5.9 months; (2) from 6 months to 11.9 months; (3) from 12 months to 24 months.

**Results.** Groups had similar demographic distribution and comorbidity rate. Most popular preoperative diagnosis was bilateral coxarthrosis (55,8% 1<sup>st</sup> group; 60,3% 2<sup>nd</sup> group; 67,6% 3<sup>rd</sup> group). Transfusion rate, median volume of red blood cell mass, allogenic blood transfusion rate, hospital adverse event rate were not significantly different between all groups. Median hospital stay was similar in all 3 groups (14 days vs 14 days vs 12 days). Difference in median operation time did not reach statistically significant level. Results of all 3 groups were similar, however, cementless endoprosthesis were much often used in patients with shorter time interval between arthroplasties, but percentage of cemented and hybrid prosthesis, on the contrary, increased with time interval till second arthroplasty.

**Conclusions.** Study demonstrates that staging of second arthroplasty does not influence hospital adverse event rate and perioperative outcome. Demographics, hospitalization time, complication and transfusion rate were similar among all 3 groups.

## THE RELATIONSHIP BETWEEN FOCAL SPOT SIZE AND IMAGE RESOLUTION IN PEDIATRIC CHEST IMAGING

Authors: *Egne Kürsa*<sup>1</sup>, *Erik Landor*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Kalle Kepler*<sup>1</sup>

<sup>1</sup> *Tartu Health Care College, Estonia*

**Keywords.** Paediatric radiography, thoracic imaging, focal spot, image resolution, radiation dose.

**Objectives.** In conventional paediatric radiography, it is recommended to use small focal spot for thoracic imaging, which limits the use of larger X-ray tube currents. A longer exposure time is necessary to obtain images at lower currents, which can cause motion artefacts.

The aim of the study was to find out the relationship between the focal spot size and image resolution in paediatric chest imaging.

**Materials and Methods.** The experiments were carried out using Siemens Ysio radiograph. A pinhole diaphragm was used to image the focal spot and the resulting image was used to take its measurements. Maximum resolution was determined using a bar pattern at various focus receptor distances (FRD). Doses of the performed exposures were recorded.

**Results.** The focal spot sizes (both 0.6 mm and 1.0 mm) corresponded to the dimensions declared by the manufacturer. For the small focal spot, the determined image resolution was 3.4 line pairs per mm (lp/mm) at FRD of 100, 150, 180 and 250 cm, limited by the maximum resolution of the image receptor, 3.47 lp/mm. As for the large focal spot, the image resolution increased from 2.8 lp/mm at 100 cm FRD to 3.4 lp/mm at 180 cm FRD. While additional filtration of 0.1 mm Cu did not significantly affect the resolution of the images, the entry skin dose decreased by 41% for the small focal spot and 44% for the large focal spot at FRD 100 cm.

**Conclusions.** A significant difference in image resolution was determined for images taken with the small and large focal spot at FRD 100 cm. The difference is reduced by increasing FRD. Larger FRD may be used to obtain paediatric chest images using large focal spot.

## USE OF ARTIFICIAL INTELLIGENCE (AI) IN BONE FRACTURE IDENTIFICATION IN PEDIATRIC PATIENTS

Authors: *Kristiāna Beča*<sup>1</sup>, *Līva Ozola*<sup>2</sup>, *Ivars Namatēvs*<sup>2</sup>

Scientific research supervisors: Dr. *Ilze Apine*<sup>3</sup>, Dr. *Olafs Volrāts*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Institute of Electronics and Computer Science, Latvia*

<sup>3</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Artificial intelligence, pediatric bone fracture, AI<sub>4</sub>DIAG, ResNet50, Faster R-CNN, X-rays, radiology.

**Objectives.** In the paediatric population, bone fractures can be hardly visible carrying the risk of misinterpretation of X-ray images by general radiologists and doctors working in emergency departments. Technologies improving the efficiency and quality, would solve the existing problem therefore AI-based computed program AI<sub>4</sub>DIAG, using machine vision neural networks ResNet50 (Keras, California, USA) and Faster R-CNN (Alegion, Texas, USA), adjusted for detection of paediatric fractures, was created. To assess the level of accuracy in recognition of hard-to-see bone fractures in x-ray images of the unique AI<sub>4</sub>DIAG program (created in Institute of Electronics and Computer Science, Rīga, Latvia).

**Materials and Methods.** First part of the study - the selection and anonymization of X-ray scans - was performed at the Children's Clinical University Hospital. The training set used to train the prototype had 1577 images and the validation set had 401 images selected from 2009 onwards, all sized 345×345 pixels. In the second part of the study, data was feed into the AI<sub>4</sub>DIAG program to classify the presence or absence of a fracture. Accuracy of the deep learning to recognize bone fractures was determined.

**Results.** Current technology readiness level (TRL) is 6 demonstrating the model is successfully trained with bone fracture data. The training went on for 100 epochs converging to 89% accuracy on the validation set, showing that the model successfully completed the classification task for pediatric bone fractures.

**Conclusions.** The neural networks of AI<sub>4</sub>DIAG architecture are able to do the detection and classification task in pediatric bones. Accuracy needs to be increased by feeding even more x-ray images into the software to expand the dataset.

## QUANTITATIVE MRI-DWI IMAGING IN COLORECTAL CANCER STAGING: CLINICAL AND HISTOPATHOLOGICAL CORRELATION

Author: *Madara Ratniece*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Maija Radziņa*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Paula Stradiņa Clinical University Hospital, Department of Radiology, Latvia*

**Keywords.** Colorectal cancer, MRI-DWI, TNM, mesorectal fascia, EMVI.

**Objectives.** The method of choice for the diagnostics and staging of colorectal cancer (CRC) is magnetic resonance imaging (MRI) due to high reported sensitivity and specificity. MRI-DWI ADC values have been shown to predict local advancement of colorectal cancer.

The aim was to investigate the usefulness of MRI-DWI imaging quantitative ADC measurement in determining local advancement of CRC and its relations to histopathological results.

**Materials and Methods.** Ninety-six CRC patients (F:M; 46:50M), mean age 68.5y (range 41-84), were included in retrospective study. All participants received an MRI of 1.5T including T2, DWI sequences. Apparent diffusion coefficient (ADC) mean values ( $\times 10^{-3}$  mm<sup>2</sup>/s) were calculated using region of interest (ROI) the size of 7-20 mm<sup>2</sup> in 3 different hypointense areas of the tumour (T-ADC) and 1 area for a lymph node metastasis (N-ADC). Extramural vascular invasion (EMVI) and mesorectal fascia (MRF) involvement were assessed on T2WI. TNM were classified according to Brierley et al. (cTNM).

**Results.** Tumours were graded: Stage I (n=5), II (n=10) III (n=66), IV (n=14). Median value for T-ADC was 0.726 (IQR 0.634-0.808), for N-ADC it was 0.748 (IQR 0.668-0.808). T-ADC showed a moderate correlation to N-ADC ( $r_s=0.529$ ;  $p<0.001$ ), weak to cancer stage ( $r_s=-0.210$ ;  $p=0.04$ ), tendency for lower value in higher cT ( $r_s=-0.266$ ;  $p=0.027$ ). cT correlated to cN ( $r_s=0.233$ ;  $p=0.022$ ) and pG ( $r_s=0.311$ ;  $p=0.004$ ). cN showed a weak correlation to cM ( $r_s=0.279$ ;  $p=0.006$ ). ECOG stage was correlated to patient's age ( $r=0.350$ ;  $p=0.001$ ). EMVI was present in 40 (42%) cases, MRF involvement in 24 (33%) cases. EMVI showed a statistically significant association to MRF ( $Chi^2=4.389$ ;  $p=0.036$ ). MRF was more prevalent in higher grade tumors ( $Chi^2=7.383$ ;  $p=0.025$ )

**Conclusions.** MRI-DWI quantitative tumour and metastatic lymph node low ADC values correlated with higher T stage but did not correlate with patients age, ECOG stage, EMVI or tumour grade. MRF was more prevalent in higher grade tumours.

## ECHOCARDIOGRAPHY VERSUS MRI IN COMPARING LEFT VENTRICULAR PARAMETERS

Author: **Roberts Lovcinovskis**<sup>1</sup>

Scientific research supervisor: Assoc. Prof. **Ingūna Lubaua**<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Echocardiography, Magnetic resonance imaging, Ejection fraction, Left ventricular mass index, Interventricular septal thickness.

**Objectives.** To compare ejection fraction(EF), interventricular septal wall thickness in diastole(IVSD), and left ventricular mass index(LVMI) using 2-D transthoracic echocardiography and cardiac magnetic resonance imaging(MRI) with an intravenous contrasting substance.

**Materials and Methods.** A retrospective cross sectional study performed at Children's Clinical University hospital, using patient databases. The study includes 45 children up to 18 years of age, 32 boys and 13 girls, diagnosed with structural heart defects, cardiomyopathy, myocarditis.

Data analyzed using IBM SPSS 23 and Microsoft Excel 2016.

**Results.** EF was overestimated in 68% of cases and underestimated in 29% of cases using echocardiography. The mean overestimation was by 10(SD±6.80)% and there was a median underestimation of 4(Q1;Q3 1.25-8.25)%. LVMI using echocardiography was overestimated in all cases but one, by a median of 21(Q1;Q3 13.75-32.00)g/m<sup>2</sup>. Using echocardiography IVSD was overestimated in 42% of cases with a median of 1(Q1;Q3 1-2)mm; underestimated 38% of the time with a median of 2(Q1;Q3 0.88-2.75)mm; and in 19% of cases IVSD measurements by echocardiography and MRI matched.

**Conclusions.** In comparison to MRI, echocardiography mostly overestimates the values of EF and LVMI and the extent of overestimation seems to be widely variable. Echocardiographic values of IVSD tend to be over and underestimated almost equally, with less of result variability. IVSD compared to EF and LVMI measurements using echocardiography are the most precise ones in reference to MRI measurements.

## CLINICAL OUTCOME IN PATIENTS WITH ACUTE ISCHEMIC STROKE WITH INSULAR RIBBON AND HYPERDENSE ARTERY SIGN

Author: *Roberts Naglis*<sup>1</sup>

Scientific research supervisor: Dr. *Nauris Zdanovskis*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Neuroradiology; Middle cerebral artery stroke; Early radiographic signs of stroke; Non-contrast CT.

**Objectives.** The aim of the study is to analyse clinical outcome based on presence of Insular ribbon sign and middle cerebral artery hyperdensity in acute ischemic stroke patients.

**Materials and Methods.** A retrospective analysis of 63 patients with acute middle cerebral artery (MCA) ischemic stroke was done. Patient evaluation was done by using NIHSS scale (The National Institutes of Health Stroke Scale) and non-contrast CT scan was done at the time of admission and on follow-up after 24-48 hours of symptom onset. Insular ribbon sign (ischemic lesion in the Insular cortex) and MCA hyperdensity was assessed in each CT scan. 3 analysis groups were defined- Insular ribbon sign; Hyperdense MCA; Insular ribbon sign and hyperdense MCA.

**Results.** The insular ribbon sign was found in 47,6% of (n=30) cases and NIHSS scores were higher in patients that had positive Insular ribbon sign compared with patients with no lesion in the Insular cortex-  $9.100 \pm 6.047$  vs.  $4.030 \pm 2.877$ . Hyperdense MCA sign was found in 53,9% (n=34) of cases and was associated with higher NIHSS score compared with normal findings-  $8.676 \pm 5.574$  vs.  $3.828 \pm 3.464$ . Both radiographic signs combined also showed markedly higher NIHSS score-  $10.565 \pm 5.727$  and  $3.682 \pm 3.137$ . NIHSS score differences between all study groups were statistically significant on follow-up scans- Insular ribbon sign (Mann-Whitney U test, n= 63, u= 255.500, p<0.01) ; hyperdense MCA (Mann-Whitney U test, n= 63, u= 211.500, p<0.001); Insular ribbon and hyperdense MCA sign (Mann-Whitney U test, n= 45, u= 78.000, p<0.001)

**Conclusions.** Insular ribbon and hyperdense MCA sign is an “easy to assess” radiographic finding that can be valuable in prediction of stroke’s clinical outcome. Furthermore, a patient with an ischemic lesion in the Insular cortex is suspected to demonstrate a high NIHSS score and are more likely to progress into surrounding MCA areas.



## KNEE JOINT CARTILAGE MRI ANALYSIS USING T2-MAPPING SEQUENCE

Author: *Vladislavs Janšins*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Ardis Platkājis*<sup>1</sup>, Dr. *Inguis Supe*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Radiology; MRI; cartilage; knee; osteoarthritis.

**Objectives.** Early degeneration of knee surface cartilage leads to early osteoarthritis. Osteoarthritis is the most common joint disease, that is starting with degradation and loss of cartilage, which is the third-most common chronic age-related joint disorder diagnosed in patients older than 65 years old, that leads to painful movements of the affected cartilage, which leads to decrease in quality of life. In 2019 in Latvia there were 40 087 patients with Goniarhrosis diagnosis (NHSRL data). The aim of this study is to determine the accuracy of T2-Mapping sequence for MRI diagnosis of early degeneration of knee surface cartilage in patients with suspected meniscal trauma and MRI approved meniscal trauma.

**Materials and Methods.** We compare 2 patient groups, measuring cartilage using T2-mapping data, using T2-mapping GE engineered program. 21 patient suspected for meniscus tear were taken as control group (age 18-40 years old), 31 patient with positive anamnesis of meniscus tear were used as examination group.

**Results.** Analysing groups by location, in Lateral-Femoral-Medial group T2-relaxation time was higher than normal relaxation time in 7 patients (33.3%) in control group and in 13 patients (41.9%) in examination group. In Lateral-Femoral-Lateral: 3 (14.3%) in control and 11 (35.5%) in examination. In Medial-Femoral-Medial: 4 (19.0%) in control and in 14 patients (45.2%) in examination. In Medial-Femoral-Lateral: 2 (9.5%) in control and in 9 (29.0%) in examination. In Lateral-Tibial-Medial: 1 (4.8%) in control and 8 (25.8%) in examination. In Lateral-Tibial-Lateral: 2 (9.5%) in control and in 5 (16.1%) in examination. In Medial-Tibial-Medial: 1 (4.8%) in control and 7 (33.3%) in examination. In Medial-Tibial-Lateral: 2 (9.5%) in control and 5 (16.1%) in examination.

**Conclusions.** In group of patients with meniscal tear T2-relaxation time is higher than in control group. Higher T2-relaxation time (above 40m/sec) was present in both groups, but was prevalent in examination group.

## INTRAOPERATIVE OSTEOTOMY ANALYSIS IN TOTAL KNEE ARTHROPLASTY USING ORTHOPAEDIC COMPUTER NAVIGATION

Author: *Rūdolfs Vētra*<sup>1</sup>

Scientific research supervisor: Dr. *Sandris Petronis*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Total knee arthroplasty, navigation system, osteotomy, malalignment.

**Objectives.** Accurate reconstruction of leg alignment is crucial for lasting long term results in total knee arthroplasty (TKA). However, component malalignment can occur and for one of the reasons being the manner of resecting the bone. The aim of this study was to evaluate the alignment of tibial and femoral cutting surfaces using a computer navigation system to determine the accuracy of bone resection.

**Materials and Methods.** All included patients were diagnosed with osteoarthritis of the knee (M-17, SSK-10) and TKA was performed in the time period of 2019-2020. Patient information was gathered from Riga 2nd Hospital records and existing joint deformation as well as bone cutting error measurements were gathered intraoperatively. All of the patients were operated using a *Aesculap OrthoPilot* navigation system.

**Results.** 39 patients were analysed. Mean age of the patients was 68.24 years (SD=10.54) at the time of operation. 76.9% (N=30) patients were female.

The most common error was in femoral osteotomy – a more extended position occurred in 51.3% (N=20) patients out of whom 13 had a cutting error of 1 degree while 7 had an error of 2 degrees. Second most frequent error was tibia cut in an extended position occurring in 11 patients. Bone cutting errors in the frontal plane occurred in 33.3% (N=13) of the operations. Overall, only 5.1% (N=2) patients had no cutting errors detected in any plane after both femoral and tibial resection.

**Conclusions.** Vast majority of patients had some sort of deviation between the planned osteotomy and the result. Most commonly made errors were femur and tibia cuts in an extended position. Effort should be made to improve bone cutting precision, because otherwise unstable loading conditions, wear and component loosening may occur. Orthopedic navigation system is useful during TKA for verification of the cutting surface and avoidance of malalignment.

## CT SEVERITY SCORE AND MODIFIED CT SEVERITY SCORE IN EARLY DIAGNOSIS OF ACUTE PANCREATITIS

Author: *Violeta Sevcenko*<sup>1</sup>

Scientific research supervisor: Dr. *Aiste Gulla*<sup>1</sup>

<sup>1</sup> *University of Vilnius, Lithuania*

**Keywords.** Acute pancreatitis; computed tomography; severity score.

**Objectives.** Acute pancreatitis is a severe disease with diverse clinical signs which causes a massive burden for health care system and remains a radiological challenge in the early stage. In this retrospective study, we investigated the benefits of computed tomography (CT) in the early detection of disease severity and the correlation between clinical severity and the CT indices, such as CTSI (computed tomography severity score) and MCTSI (modified computed tomography severity score).

**Materials and Methods.** 13 patients underwent contrast-enhanced CT within 3 weeks of onset of symptoms. Two radiologists independently evaluated CT, as well as CTSI and MCTSI.

**Results.** 13 patients, 10 men, 3 women, mean age, 48.8 years underwent contrast enhanced CT scan that was performed within 10 days of onset of symptoms. For the CTSI, mild was noticed in 1 patient (7,69%), moderate in 8 patients (61,54%) and severe in 4 patients (30,76%). For the MTSI the morphologic severity of pancreatitis was graded as moderate in 5 patients (38,46%), severe in 8 patients (61,54%), mild pancreatitis was not noticed. Among the 13 cases, 4 (30,7 %) patients were diagnosed with clinically mild pancreatitis, whilst 9 (69,23 %) patients had clinically severe pancreatitis on the Atlanta score. APACHE II score median was 15,5 for 9 patients, 3 were not graded. 8 (61,53 %) patients needed surgical intervention. 5 (38,46 %) patients developed organ failure. 7 (53,84 %) patients died.

**Conclusions.** Both CT severity and modified CT severity indices correlated with clinical outcomes.

## THE DIFFERENCE IN FLEXIBILITY OF LUMBAL JOINTS BEFORE AND AFTER YOGA GYMNASTICS ON ELDERLY AT POSYANDU ELDERLY YUSWO WIDODO SURABAYA

Author: *Gracelia Alverina*<sup>1</sup>

Scientific research supervisors: *Dr. Inge Wattimena*<sup>1</sup>, *Dr. Yudita Wulandari*<sup>1</sup>

<sup>1</sup> *Widya Mandala Catholic University, Indonesia*

**Keywords.** Yoga, Lumbar Joint Flexibility, Sit and Reach Test.

**Objectives.** Indonesian Ministry of Health Research (2017) stated that since 2000 the percentage of elderly people above 7%. Ministry of Health Indonesia predicts that the population of Indonesian seniors will continue to increase. The elderly will undergo a gradual decline in physical and mental capacities, one of which is a decrease in the flexibility of lumbar joints. It can be prevented by exercising. One of the sports that can be done is yoga.

**Materials and Methods.** The type of research used in this study is pre-experimental with one group pretest-posttest design approach. The sampling techniques used in this research are the non-probability sampling method i.e. purposive sampling with a sample number of 35 people. Elderly flexibility was measured using the sit and reach test scale.

**Results.** The flexibility of lumbar joints to thirty five elderly as subjects before yoga on the first day and after the yoga at the last day. Were measured using a meter band and the result is showed 27 elderly people with increased flexibility, 6 elderly people with decreased, and 2 people who have not increased or decreased. The Results obtained a significant difference between before yoga on the first day and after the yoga exercise at the last day ( $P = 0.00$ ).

**Conclusions.** There is a difference in the flexibility of lumbar joints before and after yoga gymnastics in elderly at Posyandu Elderly Yuswo Widodo Surabaya. With a better flexibility after yoga exercise. This condition might minimize the probability risk of musculoskeletal injury.

## EFFECTIVENESS OF TOTAL HIP REPLACEMENT IN YOUNG PATIENTS WITH AVASCULAR NECROSIS OF THE FEMORAL HEAD

Authors: *Pāvels Sidorovs*<sup>1</sup>, *Ernests Kocetkovs*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Pēteris Studers*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Traumatology and Orthopaedics hospital, Latvia*

**Keywords.** Avascular necrosis, hip replacement, orthopedics.

**Objectives.** To evaluate the feasibility of total hip replacement (THR) in young patients aged 20 to 55 with avascular necrosis of the femoral head, to compare preoperative and postoperative findings, based on the Harris hip score (HHS), to find if there is a statistically significant correlation between the Kerboul angle and preoperative HHS results, and the stage of AVN.

**Materials and Methods.** Forty nine patients participated in the study. Each patient was evaluated by the Harris hip score (HHS) preoperatively and postoperatively. Preoperative radiographic findings (AP and LL projections) were used to diagnose the stage of AVN and to measure the Kerboul angle, which is used as a prognostic indicator of the femoral head collapse.

**Results.** According to the Harris hip score, there was a 101,36% improvement in all patients on average after total hip replacement. In forty eight out of forty nine patients the Kerboul angle was > 200 degrees. There was no statistically significant difference between the Kerboul angle and preoperative HHS results ( $p=0,229$ ). There was no statistically significant difference between the Kerboul angle and the stage of AVN ( $p=0,719$ ).

**Conclusions.** Treatment varies considerably, depending on the location and severity of AVN, but the goal of initial treatment is to prevent collapse of the joint surface. One of the treatment methods is total hip replacement. All patients had a 101,36% improvement according to the postoperative HHS results comparing to preoperative ones. All patients benefited from THR. In forty eight patients the Kerboul angle was more than 200 degrees, which is indicative of high probability of the femoral head collapse. There was a tendency found showing higher HHS results correlated with lower values of the Kerboul angle, although it was statistically insignificant ( $p=0,229$ ).

## THE IMPACT OF FUNCTIONAL TRAINING ON THE PHYSICAL FEATURES AND SWIMMING PERFORMANCE OF 10 – 13 YEARS OLD SWIMMERS

Authors: *Vaida Karpavičiūtė*<sup>1</sup>, *Katrin Kočan*<sup>1</sup>  
Scientific research supervisor: Dr. *Lina Budrienė*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Physical features, functional training, endurance, muscle force, balance, functional movements.

**Objectives.** The aim of the study was to evaluate the impact of functional training on the physical features and swimming performance of 10 – 13 years old swimmers.

**Materials and Methods.** 24 swimmers were studied in the 10-13 age group. Subjects were divided into two groups: study (n=12) and control (n=12). The study group consisted of swimmers attending functional workouts once a week. The control group is for swimmers who attend traditional workouts once a week in the pool gym. Subjects tested were at the beginning of the study and at the end of the study. Physical characteristics were assessed according to McGill's methodology, long jump, FMS (Functional Movement Screen) system, modified star deviation (Y balance) test. The results of the children's swimming competitions corresponding to the start and end time interval of the study were used for the study.

**Results.** The study group had a statistically significant increase in abdominal muscle endurance ( $p=0.04$ ) from baseline to the end of the study. When comparing the two groups, statistically significant improvement in the static endurance of the torso lateral muscle (left side  $p=0.03$  and right side  $p=0.04$ ). When comparing the two groups, a statistically significant improvement in functional motion quality results was observed in the study group ( $p=0.02$ ). At the end of the study, a statistically significant increase was observed in dynamic balance indicators. The 50 m free-style swimming score in the study group was 1.23 s better than the control at the end of the study. This difference was found to be statistically significant ( $p=0.4$ ).

**Conclusions.** The physical characteristics of the subjects who attended functional workouts and the results of swimming competitions were statistically significantly better than those who attended traditional workouts in the pool gym.

## DO LARGE LUMBAR DISC PROLAPSE NECESSITATE PRIMARY FUSION?

Author: **Sharan Jhaveri**<sup>1</sup>

Scientific research supervisor: Dr. **Subir Jhaveri**<sup>2</sup>

<sup>1</sup> Smt. NHL Municipal Medical College, Gujarat

<sup>2</sup> Dr. Subir Jhaveri spine hospital, Ahmedabad

**Keywords.** PID , large disc, primary fusion.

**Objectives.** The objective of this paper is to identify best methodology to treat “large” lumbar disc herniations.

**Materials and Methods.** We identified 68 patients (Group A) with “large” PIDs, occupying more than 50% of the spinal canal, from 279 patients (168M, 111F), who underwent MIS Discectomy using tubular discectomy system. 211 patients having “non-large” PIDs comprised Group B. ODI & VAS scales for back and leg pain were noted pre-op, post-op at 6 months, and at last follow-up. Mean follow-up was 38.5(6–129) months.

**Results.** VAS(Back) improved from 7.27 to 1.03 (Group A,  $p < 0.00$ ) & from 5.04 to 1.43 (Group B,  $p < 0.00$ ); and VAS(Leg) improved from 8.53 to 0.86 (Group A,  $p < 0.00$ ) & 8.20 to 0.90 (Group B,  $p < 0.00$ ). Mean ODI improved from 71.6 to 8.44 (Group A,  $p < 0.00$ ) & from 62.77 to 10.68 (Group B,  $p < 0.00$ ). 10(14.70%) patients in Group A had recurrent PID, of which, 7 were treated non-operatively, while 3 underwent revision discectomy. Comparatively, only 5(2.37%) patients in Group B had recurrent PID, of which, only one required revision discectomy. None of the patients in either group demonstrated a second recurrence. Group A had a slightly higher degree of residual disc, but not significant statistically ( $p = 0.09$ ). Only two patients in Group B had post-operative discitis and underwent lumbar fusion. Difference in improvement between Groups A (median=6.75) & B (median=3.0) was significant ( $p < 0.00$ ), inferring greater improvement in back pain following surgery in Group A, thus invalidating primary lumbar fusion as an option.

**Conclusions.** 14.70% patients having “large” PID, developed recurrent PID. VAS and ODI scores correlated well with “non-large” group, but showed significant difference regarding improvement in back pain. No patient required lumbar fusion surgery for recurrent PID. We strongly recommend primary lumbar microdiscectomy, preferably minimal invasive tubular discectomy; as first line of approach for all disc prolapses, including “large” ones.

## DIAGNOSTIC INFORMATIVENESS OF ULTRASONOGRAPHY EXAMINATIONS IN PAEDIATRIC APPENDECTOMY PATIENTS DURING 2018-2020 AT CHILDREN'S CLINICAL UNIVERSITY HOSPITAL OF RĪGA, LATVIA

Author: *Ilze Rence*<sup>1</sup>

Scientific research supervisors: Dr. *Ilze Apine*<sup>2</sup>, Assoc. Prof. *Zane Ābola*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Acute appendicitis, visual diagnostics, ultrasonography, children, paediatric, appendectomy, histopathology.

**Objectives.** Acute appendicitis (AA) is the most common surgical emergency in children. Due to psychological characteristics and pain intolerance in pediatric patients, visual diagnostics may be difficult, leading to errors in the interpretation of results. The aim of the study was to analyze the informativeness of the performed ultrasonography (US) examinations in appendectomy patients in the Children's Clinical University Hospital (CCUH) during last two years.

**Materials and Methods.** This retrospective study includes 361 patient hospitalized in CCUH between December 2018 and December 2020 with performed diagnostic US examination and appendectomy, along with its histopathological evaluation. The degree of informativeness of US was classified as 'positive', 'ambiguous' and 'non-diagnostic'. Histopathological findings were classified as 'no appendicitis', catarrhal AA and phlegmonous/gangrenous AA with no perforation, with micro-perforation and macro-perforation. Pearson Chi-Square test of independence was used to determine the statistical significance between US findings and AA stages in children under and above 7 years. Statistical analysis was performed using Stata/IC.

**Results.** There was no difference between US and histopathological findings in either the total children population,  $\chi^2(4, N=361) = 9.49, p=0.30$ , nor in the age groups <7 years,  $\chi^2(4, N=49) = 2.87, p=0.83$ , and >7 years,  $\chi^2(4, 310) = 8.96 (p=0.35)$ .

**Conclusions.** The informativeness of US does not change depending on whether AA is catarrhal, phlegmonous/gangrenous without perforation, with micro-perforation, or with macro-perforation in either the general patient population or the age groups under and above 7 years.



# PAEDIATRICS

## FATHERS' ATTITUDES TOWARDS CHILDREN'S VACCINATION IN LITHUANIA

Authors: *Austėja Kindurytė*<sup>1</sup>, *Austėja Liekytė*<sup>1</sup>

Scientific research supervisor: Dr. *Miglė Leonavičiūtė- Klimantavičienė*<sup>2</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Vilnius University Children's Hospital, Lithuania*

**Keywords.** Vaccination, immunisation, children, fathers.

**Objectives.** Childhood vaccination is one of the key public health practices that saves more than two million lives every year. It is known that success of any childhood vaccination program is highly dependent on parents' attitudes toward immunization. Accordingly, in order to improve the vaccination coverage, it is necessary to reveal factors that have significant impact on negative parents' approach.

**Materials and Methods.** 1464 respondents were given anonymous original questionnaire. Statistical data analysis was performed using MS Excel and R Commander. A statistically significant correlation was considered when the p value  $< 0,05$ .

**Results.** 1193 (81,5%) fathers were positive towards mandatory vaccination. Fathers with advanced education were more positive towards mandatory vaccination ( $p=6.273e-11$ ). Only 492 (33,6%) fathers used additional vaccination for their kids. Also, more fathers with higher education vaccinated their kids with additional vaccines ( $p=0.00000002309$ ). Also, older fathers were more positive towards mandatory ( $p=0.0005493$ ) and additional vaccines ( $p= 3.31e-12$ ). Fathers, who have more children were more likely to choose additional immunization ( $p= 6.193e-14$ ). Fathers, who spend more time with their children during the day were less likely to choose additional vaccination, compared with those, who spend less time ( $p= 0.04992$ ).

**Conclusions.** Fathers with advanced education were more positive towards mandatory vaccination. Also, more fathers with higher education vaccinated their kids with additional vaccines. Also, older fathers were more positive towards mandatory and additional vaccines. Fathers with more children were more likely to choose additional immunization. Fathers, who spend more time with their children during the day, were less likely to choose additional vaccination, compared with those, who spend less time.

## CYSTIC FIBROSIS NEONATAL SCREENING RESULTS EVALUATION SINCE 1ST OF JULY IN 2019

Author: *Patricija Platace*<sup>1</sup>

Scientific research supervisor: Dr. *Elīna Aleksejeva*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Screening, Cystic fibrosis, Newborns.

**Objectives.** CFNS program was implemented in Latvia in July 2019. The CFNS is based on double detection of immunoreactive trypsinogen (IRT<sub>1</sub>/IRT<sub>2</sub>), sweat test and DNA analysis for *CFTR*. The aim of the study was to assess the average values of IRT<sub>1</sub>/IRT<sub>2</sub> for false positive cases and compare to the average values of IRT<sub>1</sub>/IRT<sub>2</sub> for diagnosed CF disease and to evaluate risk factors for false positives IRT<sub>1</sub>/IRT<sub>2</sub> values and compare those with described in the literature. False positive risk factors mentioned in literature: prematurity, low birth weight, traumatic birth, congenital anomaly and perinatal asphyxia.

**Materials and Methods.** A descriptive retrospective study using Children's Clinical University database from July 2019 till December 2020. Statistical analysis was processed by Microsoft Excel. IRT was measured by fluorometric enzyme immunoassay, with a cutoff value of 70 µg/L.

**Results.** 27057 neonates underwent CFNS, 490 (1.8 %) of these had elevated IRT<sub>1</sub>, and 85 (0.3%) – IRT<sub>2</sub>. CF was confirmed molecularly in four cases (p.[Phe508del];[Phe508del]) in three cases, and one -p.[Ser168Leu];[Leu1335Pro]) with positive sweat test (> 60 mmol/l). Average IRT<sub>1</sub> value in false positive cases was 105,62 mkg/L, but in confirmed CF cases IRT<sub>1</sub>-158,35 mkg/L. Average IRT<sub>2</sub> value in false positive cases was 80,85 mkg/L and in confirmed CF cases IRT<sub>2</sub> - 171,57 mkg/L. The potential risk factors for false positive IRT<sub>1</sub>/IRT<sub>2</sub> results are: prematurity - 9 (10,5%), low birth weight - 8 (9,9%), traumatic childbirth - 15 (17,6%), congenital anomaly - 6 (7,4%), perinatal asphyxia - 5 (6,2%), mothers infection during pregnancy - 6 (7%), congenital infections - 4 (4,7%), umbilical cord strangle - 5 (5,8%).

**Conclusions.** In the case of CF, IRT<sub>2</sub> mean values are 2 times higher compared to false positive IRT<sub>2</sub> showing a high sensitivity of the method. Potential risk factors for IRT<sub>1</sub>/IRT<sub>2</sub> results are consistent with the literature data described, but potential causes should be further evaluated.

## RESULTS OF TRANSCATHETER CLOSURE OF ATRIAL SEPTAL DEFECTS IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL FROM 2008 UNTIL 2018

Authors: *Elizabete Zaņģe*<sup>1</sup>, *Edīte Boitmane*<sup>1</sup>

Scientific research supervisors: Dr. *Elīna Ligere*<sup>1,2</sup>, Dr. *Inga Lāce*<sup>1,2</sup>, Dr. *Valts Ozoliņš*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Atrial septal defect (ASD), transcatheter closure, pediatrics, complications.

**Objectives.** The secundum atrial septal defect (ASD) is the fourth most common congenital heart disease with incidence ~ 6-9/1000 births, characterized by a septal defect that results in shunt flow from the left to the right atrium of the heart, leading to pulmonary circulatory hypervolemia, hypertension, and right ventricular failure. Transcatheter ASD closure is nowadays the method of choice for closing a type II (secundum type) atrial septal defect. In CCUH this method has been performed since 2008. Research aim was to evaluate the results of transcatheter closure of type II (secundum type) atrial septal defects and safety in children at the Children's Clinical University Hospital (CCUH).

**Materials and Methods.** In a retrospective descriptive study, the medical histories of 94 patients with transcatheter-closed ASD in the period 2008 - 2018 were selected and analyzed in CCUH. Patient demographics, clinical symptoms of the disease, objective and echocardiographic findings before and after ASD closure, frequency of complications (closure embolization, arrhythmia, residual defect, etc.) were evaluated. The data was statistically processed and analyzed with IBM SPSS 26.

**Results.** The study analyzed 94 patients, of which 61.3% were female and 38.7% were male. The mean age of patients diagnosed with ASD was 5.45 years (IQR 1-9.5), and the age at the time of manipulation was 6.85 (IQR 3-10). Of the 94 patients who underwent manipulation, in 93.6% (n=88) of cases the outcome of the operation was successful, 6.4% (n=6) of the operations were complicated by embolization of the device and need of subsequent surgical correction. The average ASD size is 13.87 mm (IQR 12-15 mm). Complicated course of closure correlated with a higher than average echocardiographic ASD in mm.

**Conclusions.** Transcatheter closure of atrial septal defects in CCUH shows good surgical results and is considered a safe and effective method of treatment.

## PNLR COULD BE A NOVEL BIOMARKER IN EARLY VIRAL VERSUS BACTERIAL DIAGNOSTICS IN PEDIATRIC EMERGENCY

Authors: *Jurate Pakrosnyte*<sup>1</sup>, *Kipras Snarskis*<sup>2</sup>  
Scientific research supervisor: Dr. *Lina Jankauskaite*<sup>3</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Lithuanian University of Health Sciences, Department of Pediatrics, Lithuania*

<sup>3</sup> *Hospital of Lithuanian University of Health Sciences Kauno Klinikos, Kaunas, Lithuania*

**Keywords.** Early biomarkers of infection, PNLR.

**Objectives.** The aim of the current study was to investigate the diagnostic value of standard infection biomarkers, such as CRP, WBC, neutrophils, platelets (PLT) as well as PNLR (PLT\*neutrophil/lymphocyte ratio) to discriminate between early and late bacterial and viral infections.

**Materials and Methods.** We performed a prospective single-centre study. Children with SIRS criteria were enrolled into the study. Exclusion criteria: chronic conditions, immunodeficiency, recent antibiotic use. 179 children (1 to 5 years old) were enrolled and further divided according to the final diagnosis into three groups: severe bacterial infection (SBI) (n=22), bacterial infection (BI) (n=37) and viral infection (VI) (n=120) patients. Also, every group were subdivided into early arrival ((EA)(<12h)) and late arrival ((LA (>12h)). For all study participants, blood has been drawn, CBC and CRP levels were assessed and PNLR was calculated. Data analysis was performed using GraphPad Prism. P-value of <0.05 was considered significant.

**Results.** There was no significant difference in children age or gender between SBI, BI and VI groups (median-30 mo, male (55.86%)). We observed a significant difference in EA children's neutrophils between SBI, BI and VI (18.9±9.846; 15.24±4.317; 8.627±3.715, p=0.0001). CPR was significantly different in early arrival patients between SBI, BI and VI (41.96±52.18; 38.14±18.29; 14.36±35, p=0.0004). No difference was observed in PLT in early arrival but the levels of PLT in LA showed to be higher in SBI (311.9±87.63 (SBI) vs 265.2±79.41 (BI) vs 252.8±75.51 (VI), p=0.0314). The calculated PNLR between all the groups showed to be significantly higher in SBI, BI compared to VI (3502±1887; 2962±1261; 1602±1114, p=0.0073). With an AUC 0.7880 (CI 0.6602 to 0.9158, p=0.01909). With a cut-off value of 1909, PNLR identified subjects with SBI/BI with the sensitivity of 76.92% and specificity of 69.29%.

**Conclusions.** PNLR is a promising biomarker to discriminate between early SBI, BI and VI in clinical practice.

## EFFECT OF SLEEP HYGIENE ON DAYTIME SLEEPINESS IN LATVIAN ADOLESCENTS: GENDER DIFFERENCES

Authors: *Monta Urbane*<sup>1</sup>, *Agnese Urbane*<sup>1</sup>

Scientific research supervisor: Dr. *Marta Celmiņa*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Epilepsy and Sleep Medicine Center, Latvia*

**Keywords.** Sleep, daytime sleepiness, PSQI, adolescents.

**Objectives.** Good and sufficient sleep is important for physical and mental health of the individual, and is a positive indicator of well-being. However, in adolescents quality and quantity of sleep decrease due to various reasons. The aim of this study was to investigate sleep hygiene, daytime sleepiness and sleep quality in Latvian adolescents.

**Materials and Methods.** A prospective cross-sectional survey was carried out in 2020 to evaluate sleep quality (using Pittsburgh Sleep Quality Index, PSQI) and daytime sleepiness (using Pediatric Daytime Sleepiness Scale) in Latvian adolescents. Statistical analysis was performed, using multivariate linear regression, Pearson Chi-square and T test.

**Results.** Final sample consisted of 320 adolescents (47% girls), median age 14,1 +/- 1,23 (12-17) years. According to National Sleep Foundation recommendations, 73,4% of adolescents slept less than recommended for age. However, only 44,8% thought they were not sleeping enough. Poor sleep quality (>5 points in PSQI) was detected in 37,9% of children and was related to a higher daytime sleepiness (16,76 vs. 12,61,  $p < 0,001$ ). Statistically significant differences were found between genders: more girls evaluated their sleep as insufficient (53,6% vs. 36,9%,  $p < 0,05$ ), „always” had difficulties waking up (27,2% vs. 15,4%,  $p = 0,012$ ), slept less than 7 hours (51,0% vs. 34,6%,  $p = 0,012$ ) had poorer sleep quality (47,9% vs. 28,8%,  $p = 0,001$ ), had higher degree of daytime sleepiness (15,59 points vs. 13,04 points in PDSS,  $p < 0,001$ ) than boys. Body mass index had no statistically significant effect on adolescent sleep or daytime sleepiness.

**Conclusions.** The prevalence of poor sleep quality and quantity is high in Latvian adolescents, especially girls. Reasons for difference in sleep parameters between sexes should be studied in more detail taking into account psychological factors. Proper education about healthy sleep habits should be included in school's curriculum.

## COMPARISON OF COVID-19 CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS IN CHILDREN AT THE OUTPATIENT AND HOSPITAL SETTING IN LATVIA: A DESCRIPTIVE RETROSPECTIVE COHORT STUDY

Author: *Anna Beate Apsite*<sup>1</sup>

Scientific research supervisors: Prof. *Jana Pavāre*<sup>1</sup>, Dr.med. *Liene Smāne*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** COVID-19, viral illness, pediatric population.

**Objectives.** To compare the clinical and epidemiological features of acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection of children in Latvia at the outpatient and hospital setting.

**Materials and Methods.** The retrospective cohort study was conducted from March 2020 to December 2020 and totally 123 SARS-CoV-2 positive children (0-18 years of age) were enrolled in the study. All patients were evaluated in a face-to-face visit according to a specially designed study protocol which consisted of 95 questions divided into 8 sections. Descriptive statistics were used to present the data.

**Results.** The outpatient phase included 100 children, the hospital – 23. Average age in outpatient phase – 11,2, hospital – 6,9. Among outpatient patients 39% (n=36) were girls, 61% (n=56) – boys; but in hospital setting – 65% (n=15) girls, 35% (n=7) boys. Both groups noted contact with a known COVID-19 positive patient in the last 14 days (outpatient phase – 74% (n=74), inpatient – 78% (n=18)). At the outpatient stage 92% (n=92) the disease was mild. Inpatient – 74% (n=17) disease was mild, 13% (n=3) moderate, 8% (n=2) severe. The most common clinical symptoms in outpatient phase were – increased temperature 80% (n=74), fatigue 46% (n=42), headache 37% (n=34); in hospital setting – increased temperature 96% (n=22), cough 57% (n=13), rhinorrhoea 48% (n=11) and fatigue (n=11).

**Conclusions.** COVID-19 clinical course in children, compared to adults, is mostly mild and only very small part of the children needed hospitalisation. Hospitalisation was needed for only more severe cases of COVID-19, when there were complications present. In both outpatient and hospital settings the symptoms were nonspecific and overlap with other seasonal viral diseases.

## POSTNATAL FOLLOW-UP OF ANTENATALLY DIAGNOSED FETAL ARRHYTHMIA

Author: *Zanda Grīnberga*<sup>1</sup>

Scientific research supervisor: Dr. *Inga Lāce*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Fetal arrhythmia, supraventricular paroxysmal tachycardia.

**Objectives.** Aim of this study was to assess the efficiency of initiated antiarrhythmic therapy in fetuses with cardiac arrhythmias and evaluate these patient's postnatal development.

**Materials and Methods.** This retrospective study included fetuses with diagnosed cardiac arrhythmias without any evidence of congenital heart defects, between 2008 and 2020 in Children's Clinical University Hospital (CCUH) in Latvia. Data was collected from fetal echocardiography database. Further patient development and long term follow up were evaluated from patient medical histories. Data was analysed using descriptive and statistical methods.

**Results.** During this period in CCUH fetal echocardiography was performed on average 790 times per year. Fetal arrhythmias were diagnosed 110 times. Rare or frequent extrasystoles were registered in 65% of cases (n=71), while supraventricular paroxysmal tachycardia (SVPT) – 14% (n=15) of cases. At the time of diagnosis, the fetuses average gestational age was 30 weeks. In SVPT cases, prenatal antiarrhythmic therapy was started for 12 patients; Digoxin was used as first line medication. It was possible to retrospectively track 10 patients from this group. Digoxin was started antenatally in 9 cases. In six – therapy was effective and no cardiac arrhythmias were registered afterwards. In 4 cases SVPT remained till birth; postnatally their clinical condition was severe, they needed respiratory support and initiation of antiarrhythmic drugs. In all cases were used – Adenosine, Amiodoron, Proranolol. After discharge all patients received Propranolol treatment for 6 – 18 months, and they were regularly tested for repeated SVPT episodes, but no such episodes were diagnosed.

**Conclusions.** Digoxine is used as first – line medication for fetal SPVT. In cases where antenatal therapy has no effect, postnatally the condition of newborn is severe and requires intensive care and aggressive treatment. In general, long term prognosis is excellent and there are no permanent arrhythmias in the cases of successful therapy.

## NATION-WIDE PEDIATRIC SLEEP QUESTIONNAIRE HIGHLIGHTS SLEEP PROBLEMS AND RECOMMENDED ACTIONS BY THE MEDICAL COMMUNITY: KEY TAKE-AWAYS

Authors: *Anete Sperberga*<sup>1</sup>, *Renate Apse*<sup>1</sup>

Scientific research supervisor: Dr. *Marta Celmiņa*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Epilepsy and Sleep Medicine Center, Latvia*

**Keywords.** Sleep problems, pediatric sleep, knowledge about infant sleep.

**Objectives.** Sleep problems are highly prevalent in early childhood, and a common reason of concern to caregivers and physicians. There is an abundance of information about sleep but it is not always evidence-based. The aim of this study was to identify infant/toddler sleeping habits, information on sleep available for parents and recommendations given by the doctors.

**Materials and Methods.** A cross-sectional study was conducted in Latvia (December 2020 - January 2021). Parents with children aged 0-36 months filled an online questionnaire on pediatric sleep patterns and difficulties. Statistical analysis: IBM SPSS Statistics 26 (chi-square test).

**Results.** The final sample consisted of 616 parents; 63.9% of them admitted to have encountered infant sleep problems - night wakings with the parent calming the child (62.9%), difficulties falling asleep (39.0%), and the child not sleeping in its own crib (36.0%). Only 29.9% of these parents sought Primary Care Physician's (PCP) help and 41.3% went to see a specialist (Pediatric Neurologist - 19.4%, Osteopath 17.0%, or Sleep Consultant 17.0%). Recommendations by PCP vs. specialist were as follows: medical/homeopathic/natural medicines (42.2% vs. 14.1%), waiting for the problem to subside (65.3% vs. 21.5%), improving sleep habits (38.1% vs. 23.0%). Parents who did not receive prenatal courses on infant's sleep, more frequently reported continued sleep problems (62.6% vs. 17.4%,  $p=0.002$ ). Majority (91.4%) of the respondents would like to receive information about pediatric sleep in the form of free video lectures (53.2%), brochures (47.1%), or lectures about sleep within prenatal courses (36.5%).

**Conclusions.** Lack of knowledge about infant/toddler sleep among the medical community leads to unnecessary medical intervention. There is a strong need for evidence-based information about pediatric sleep for parents and physicians.



## PARENTAL KNOWLEDGE AND ATTITUDE TOWARDS PEDIATRIC EPILEPSY IN LATVIA

Author: *Violeta Zubkova*<sup>1</sup>

Scientific research supervisors: Dr. *Jurģis Strautmanis*<sup>2</sup>, Dr. *Marta Celmiņa*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Epilepsy and Sleep Medicine Center, Latvia*

**Keywords.** Paediatric epilepsy, myths, epilepsy care.

**Objectives.** Knowledge and attitude towards children epilepsy has a variable cultural background. Parental involvement in epilepsy management, communication and decision-making has a great impact on successful treatment of this condition. The aim of this study was to investigate parental knowledge and attitude towards epilepsy of their children.

**Materials and Methods.** In a cross-sectional study (November – December, 2020) Latvian parents of children with epilepsy answered to survey using internet or during outpatient visit to Paediatric Neurologists. Data was analysed using IBM SPSS 26.0. Mann Whitney, Fisher Exact Test and Chi square were used.

**Results.** Final sample consisted of 93 parents (93.5% female). Mean age was 37.7±6.0 years, 58.1% had higher education, 44.1% lived in Riga. Mean age of children was 9.0±4.1 years (55.9% male). Overall, 43% of children received mainstream education (12.9% attended kindergarten, 30.1% - school). Majority of children (54.8%) had presumably severe epilepsy (refractory and/or structural/genetic). Overall, parental knowledge of epilepsy was good. However, substantial part of respondents considered several unproved factors to be the cause of epilepsy (vaccination – 12.9%, changes in moon phase – 18.3% or weather – 5.4%, physical activity – 21.5%). Out of 15 correct seizure management strategies only four were performed by more than 50% of parents (remaining calm, supporting child, timing the seizure, waiting till the seizure subsides). Higher education level was statistically significantly associated with belief that epilepsy is not incurable (75.9% vs 48.7%,  $p<0.023$ ), some epilepsy types could be treated surgically (96.3% vs. 81.1%,  $p<0.03$ ), and children with epilepsy should be vaccinated according to the national vaccination plan (75.9% vs 53.8%,  $p<0.012$ ).

**Conclusions.** Although overall parental knowledge of pediatric epilepsy is adequate, several myths and misinformation are still present in epilepsy patient families. Ensuring education and support in community should be one of main epilepsy care priorities.

## ANALYSIS OF INFECTION INCIDENCE AND THEIR RISK FACTORS IN CHILDREN'S CLINICAL UNIVERSITY HOSPITAL'S NEONATAL INTENSIVE CARE UNIT

Author: *Linda Ločmele*<sup>1</sup>

Scientific research supervisor: Dr. *Dace Sniedze*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Late-onset sepsis, newborns.

**Objectives.** Immunity of newborns, especially premature infants with very low birth weight (VLBW; < 1500 g), has not strengthened enough. Neonates often require medical procedures, hence increasing risk of infections, including healthcare associated ones. The most common cause of infection in neonates are central catheter-related bloodstream infections, namely, early onset sepsis (EOS) and late onset sepsis (LOS). In order to improve preventive measures in the hospital, it is important to monitor the incidence of infections and understand their risk factors. The aim is to identify the most common group of bacterial agents and their relation to mortality of neonates < 1500 g with LOS.

**Materials and Methods.** A retrospective study was conducted in Children's Clinical University Hospital's (CCHU's). Data from all cases of neonates with birth weight < 1500 g was collected in one-year period (01.01.2019-31.12.2019) using CCHU data system Andromeda and ICIP. Statistical analysis was processed by Microsoft Excel.

**Results.** From 367 patients analysed, 122 (33.24%) were VLBW < 1500 g. LOS was confirmed in 20 (16.39%) neonates with VLBW. There were 16 (80%) neonates, who had at least one positive blood culture; in 20% of cases microorganisms were not isolated. The vast majority (n=12, or 60%) of LOS were caused by Gram-positive organisms and in 8 (40%) cases LOS were caused by Gram-negative organisms. The most common microorganisms were *S.hemolyticus* and *S.epidermidis*. 65% of VLBW neonates with LOS had central or peripheral central catheter. The median age of neonates with LOS was 14 days. In NICU, mortality in neonates with VLBW was 20%.

**Conclusions.** Gram positive organism induced LOS occurred in 60% of VLBW in CCHU's NICU during one-year period. The most common microorganisms were *S.hemolyticus* and *S.epidermidis*. Mortality of VLBW with LOS was 20%.

## PAIN MANAGEMENT IN PEDIATRIC ILEOCOLIC INTUSSUSCEPTION

Author: *Emīlija Zeltiņa*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Astra Zviedre*<sup>1,2,3</sup>,  
Dr. *Zanda Pučuka*<sup>3,4</sup>, Dr. *Jānis Kolbergs*<sup>5</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Department of Pediatric Surgery, Children's Clinical University Hospital, Latvia*

<sup>3</sup> *Department of Pediatrics, Rīga Stradiņš University, Latvia*

<sup>4</sup> *Department of Emergency, Children's Clinical University Hospital, Latvia*

<sup>5</sup> *Department of Anesthesiology and Intensive Care, Children's Clinical University Hospital, Latvia*

**Keywords.** Ileocolic intussusception, FLACC pain score, analgesia.

**Objectives.** Ileocolic intussusception (ICI) is one of the most common surgical emergencies in children. Over 90% of all cases involve abdominal pain. The aim of the study is to determine a provision of analgesia before the reduction of ileocolic intussusception.

**Materials and Methods.** A retrospective study was made including 93 patients admitted to Emergency Department with ICI (January 2017 - December 2019). Patients were divided into two groups – 84 patients with FLACC pain score (FLACC) in the range of 0-5 and 9 patients with FLACC in the range of 6-10. Clinical presentation, diagnostic, FLACC and analgesia before the treatment were obtained and compared between groups. Statistical analysis was made by SPSS 26.0 ( $p < 0.05$ ). The study was approved by the Institutional Ethics Review Board.

**Results.** 93 patients with the median age of 29.2 (11±36) months, 66 (71.0%) were boys and 27 (29.0%) were girls. ICI was confirmed by ultrasound in 96.8% of the cases. 77 (83%) of all patients had pneumatic reduction of ICI and 16 (17%) – surgical treatment of ICI. Statistically significant differences between study groups were found among diagnostic and analgesia. Patients with FLACC  $\geq 6$  had significantly more usage of X-ray compared to other group before ICI reduction ( $\chi^2 = 7.5$ ,  $df=1$ ;  $p=0.006$ ). Necessity of ketorolac tromethamine, fentanyl and morphine were significantly increased for patients with FLACC  $\geq 6$  ( $\chi^2 = 32.5$ ,  $df=1$ ;  $p=0.000$  vs.  $\chi^2 = 17.1$ ,  $df=1$ ;  $p=0.001$ ) compared to patients with FLACC  $< 6$ . Statistically significant differences in study groups were not found between clinical symptoms, method of treatment and usage of acetaminophen, morphine, metamizole and ibuprofen.

**Conclusions.** Patients admitted to Emergency Department with abdominal pain and suspected ICI require opioids to release pain of FLACC  $\geq 6$ .

## FATHERS' INVOLVEMENT IN THE CHILD'S EDUCATION

Authors: *Austėja Liekytė*<sup>1</sup>, *Austėja Kindurytė*<sup>1</sup>

Scientific research supervisor: Dr. *Miglė Leonavičiūtė Klimantavičienė*<sup>2</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Vilnius University Hospital Santaros klinikos; Vilnius University Faculty of Medicine, Lithuania*

**Keywords.** Fathers; education; involvement; children.

**Objectives.** Parents are considered the primary context of children's development. It is known, that when fathers get involved in their children's early education, children tend to learn more, achieve better results in the future.

**Materials and Methods.** 1464 respondents received anonymous original questionnaire. Statistical data analysis was performed using MS Excel and R Commander. A statistically significant correlation was considered when the p value <0,05.

**Results.** 819 (56%) fathers spend more than 2 hours a day with their children. Older fathers tend to spend less time with their children compared with younger (p= 0.005026). Only 37 (2,5%) fathers help children with educational tasks compared to mothers. 536 (36,7%) answered that they spend the same amount of time with children during educational tasks. 492 (41,6%) respondents answered, that mothers more often participate in the school parents meetings. Fathers, with higher education more often participated in the school parents meetings together with mothers, compared to advanced education fathers (p= 0.03625). Also, older fathers were more likely participate in the school meetings alone (p= 0.01744). 940 (66,9%) respondents answered, involvement into child's education depends on the problem, and on child's decision, to which parent children ask for help.

**Conclusions.** Older fathers tend to spend less time with their children compared with younger. Fathers are less likely to participate in child's educational tasks. Parents with higher education more often participate in the school parents' meetings together, compared with advanced education fathers, in these families usually mother participates. Also, older fathers were more likely to participate in school meeting alone. When children have learning or managing difficulties, it depends on the problem, which parent they would choose to ask for help.

## ROLE OF IMMUNOMODULATOR THERAPY IN MYOCARDITIS IN CHILDREN: A META-ANALYSIS

Authors: *Helly Thakkar*<sup>1</sup>, *Avichal Dani*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Devang Rana*<sup>1</sup>

<sup>1</sup> *Smt. NHL Municipal Medical College, Ahmedabad, Gujarat*

**Keywords.** Immunomodulator therapy, paediatric myocarditis, death, need for transplantation.

**Objectives.** To assess the role of different immunomodulator therapies in myocarditis in children and its impact on the incidence of death and need for transplantation.

**Materials and Methods.** A total of 14 RCTs having 879 patients out of which 416 patients received immunomodulator therapy and 463 patients were given conservative treatment following PRISMA guidelines till August 2020 were matched for inclusion and exclusion criteria. The following search strings and MESH terms were used: “immunomodulator therapy”, “paediatric myocarditis”. Following this, role of different treatment options such as corticosteroids, intravenous immunoglobulin and corticosteroids plus azathioprine or cyclosporine combination on the outcome of rate of death or transplantation was analysed. RevMan 5.3 was used for appropriate statistical tests. Fixed and Random Effect Model Test were used and  $p < 0.05$  was considered statistically significant.

**Results.** Intravenous immunoglobulin therapy was found to be associated with decreased incidence of death or need for transplantation (OR=0.421, CI= 0.208 to 0.854,  $p < 0.017$ ). However, Corticosteroids plus azathioprine or cyclosporine therapy was found to be associated with incidence of death or need for transplantation (OR=1.781, CI=1.122 to 2.826,  $p < 0.014$ ). There was no significant association between corticosteroids single therapy and incidence of death or need for transplantation.

**Conclusions.** The present metanalysis does not support corticosteroids or combination of corticosteroids plus azathioprine or cyclosporine as superior to conventional therapy in myocarditis in children. However, intravenous immunoglobulin might be beneficial in reducing death or need for transplantation in myocarditis in children.

## LACK OF KNOWLEDGE ABOUT PEDIATRIC SLEEP RELATED PROBLEMS IN LATVIAN PHYSICIANS

Author: *Kristīne Kozlova*<sup>1</sup>

Scientific research supervisors: Dr. *Raita Kusiņa*<sup>3</sup>, Assoc. Prof. *Ilva Daugule*<sup>4</sup>,  
Dr. *Jurģis Strautmanis*<sup>2</sup>, Dr. *Marta Celmiņa*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Epilepsy and Sleep Medicine Center, Latvia*

<sup>3</sup> *Children's Clinical University Hospital, Latvia*

<sup>4</sup> *University of Latvia, Latvia*

**Keywords.** Sleep medicine, pediatric sleep, physicians' knowledge and attitude.

**Objectives.** Although prevalence of pediatric sleep problems is high and Sleep Medicine has developed as a separate medical field, it is rarely included in standard Medical syllabus. The aim of this study was to evaluate Latvian physicians' knowledge and attitude towards pediatric sleep problems.

**Materials and Methods.** In a cross-sectional study (September 2019 - August 2020) General Practitioners (GP), Pediatricians (P) and GP with additional education in Pediatrics (GP-P) completed a questionnaire about socio-demographic factors, attitude and knowledge about sleep medicine. Statistical analysis of data was performed using IBM SPSS 26.0 (Chi-square, Fisher's exact test).

**Results.** Final sample consisted of 207 respondents (31.9% GP, 29.0% P, 19.3% GP-P, 19.8% residents). Majority of respondents worked in outpatient settings (63.8%), 16.4% - in hospital, 19.8% - both. Only 4.9% of physicians evaluated their knowledge as good with significant differences between specialties (7.7% GP-P vs. 2.4% residents ( $p=0.006$ )) and work settings (7.0% outpatient vs. 0.0% inpatient ( $p<0.001$ )); 42.2% - as mostly poor (52.2% P vs. 15.4% GP-P ( $p=0.006$ ) and 73.5% inpatient vs. 31.8% outpatient ( $p<0.001$ )). Only 25.1% asked about sleep often, while others - rarely or never. Mostly parents of toddlers (48.3%) and teens (47.9%) were enquired about sleep. Majority of physicians had prescribed medication (61.9%) or referred patient to a specialist (56.1%), with significant difference between outpatient and inpatient physicians (71.7% vs 44.1% ( $p=0.001$ ) and 73.8% vs 14.7% ( $p<0.001$ ), respectively). Majority of respondents considered sleep disorders to be an essential problem (83.6%), would be ready to attend lectures (93.2%), agreed that Sleep Medicine should be included in curriculum - even if it meant less time for other topics (76.8%).

**Conclusions.** Poor knowledge about pediatric sleep problems results in unnecessary referrals and needless drug prescriptions. Sleep Medicine should be included in Medical University syllabus.

## FACTORS AFFECTING SLEEP IN 6-36 MONTHS OLD LATVIAN CHILDREN

Authors: **Paula Branta**<sup>1</sup>, **Artis Lapsiņš**<sup>1</sup>, **Karina Romanova**<sup>1</sup>, **Elīna Voitehoviča**<sup>1</sup>

Scientific research supervisors: Dr. **Marta Celmiņa**<sup>2</sup>, Asoc. Prof. **Lilian Tzivian**<sup>1</sup>,  
Dr. **Egija Zelča**<sup>1</sup>, Dr. **Kristīna Sindecka**<sup>1</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Epilepsy and Sleep Medicine Center, Latvia*

**Keywords.** Sleep onset association disorder, electronic devices.

**Objectives.** Parental perception of their infant's sleep as problematic increases parental stress. One of the factors that affect child's sleep is the use of electronic devices, which was the main subject of this study.

**Materials and Methods.** In a cross-sectional study performed in Latvia (November 2018 – February 2019), parents of 6-36-month-old children reported on infant's sleep, smart electronic device usage, and daily habits of their children using an online survey. Multiple logistic regression models adjusted for individual covariates were built for the parental assessment of problematic sleep. Models were built separately for each of 6-months age groups. Statistical significance was considered at  $p < 0.05$ .

**Results.** Data of 4114 respondents (51.6% male; 45.8% with PhD) was analysed. 30.9% of parents assessed their child's sleep as problematic, and this differed from other educational categories ( $p = 0.05$ ). Singletons had mostly problematic sleep and middle children were those with the best sleep quality ( $p < 0.01$ ). Children falling asleep while being rocked or fed slept worse than children that fell asleep in their own crib (48.1% vs. 21.5%,  $p = 0.05$ ). Use of electronic devices by the child was not significantly related with parental perception of problematic sleep. In multiple regression model, a probability of problematic sleep was increased by a greater amount of time needed to put child to sleep (odds ratio, OR = 1.03 [95% confidence interval 1.02-1.03]), more night walking (OR = 1.19 [1.09-1.30]), and excessive use of smart devices (OR=1.94 [1.53-2.46]) i. Sleeping alone in a bed in parents' room or in a separate room were inversely associated with problematic sleep (OR=0.53 [0.30-0.92] and OR=0.5 [0.27-0.94], respectively).

**Conclusions.** To improve infants' sleep quality and decrease parental stress parents should be educated on physiology of sleep, most frequent sleep disturbances (sleep onset association disorder) and healthy sleep habits.

## ASSOCIATION OF MAGNETIC RESONANCE IMAGING FINDINGS WITH CLINICAL AND LABORATORY SIGNS OF SACROILIITIS IN PATIENTS WITH JUVENILE IDIOPATHIC ARTHRITIS

Authors: *Viktorija Aleksejeva*<sup>1</sup>, *Kristīne Kozlova*<sup>1</sup>

Scientific research supervisor: Dr. *Zane Dāvidsone*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Juvenile idiopathic arthritis (JIA), sacroiliitis (SI), magnetic resonance imaging (MRI).

**Objectives.** JIA is an autoimmune disease that affects children and can cause sacroiliitis. MRI can help in early diagnostic of sacroiliitis additionally to patient's subjective complaints. There is evidence regarding association between subjective complaints of sacroiliitis and MRI findings. The objectives were to evaluate MRI findings and association with clinical signs of sacroiliitis, including symptoms, children's health questionnaires (CHAQ), visual analogue scale (VAS) assessments, laboratory results.

**Materials and Methods.** Medical history of 82 patients over the period of 2014 to 2018 were analyzed in this retrospective study, using the CCUH database. MS Excel and IBM SPSS Statistic 26.0 were used for data compilation and analysis.

**Results.** Out of all patients referred to MRI 72% had findings of sacroiliitis with no significant difference between patients with/without complaints of lower back pain (73% vs 70% respectively,  $p=0.422$ ). Mean CHAQ score was 0.484 and VAS pain was 4.57 with significant difference between patients with/without signs of active inflammation on MRI (0.398 vs 0.762 respectively,  $p=0.009$ ; 5.54 vs 4.14,  $p=0.05$ ). CRP was elevated only in 20% ( $n=13/65$ ) of patients with significant difference between the MRI findings (0% of chronic sacroiliitis ( $n=0/10$ ), 23% acute ( $n=7/30$ ), 60% of chronic sacroiliitis with exacerbation ( $n=3/5$ ),  $p=0.007$ ). Out of 52 patients with radiologically confirmed sacroiliitis ESR was elevated in 27% ( $n=13$ ), thrombocytes in 16% ( $n=8$ ) and leucocytes - in 18% ( $n=9$ ). ANA was positive in 50% ( $n=22$ ), RF positive in 14% ( $n=7$ ), HLA-B27 positive in 39% ( $n=19$ ) with no significant associations with MRI results.

**Conclusions.** There was no association between MRI findings and patients' complaints and laboratory markers, moreover CHAQ and VAS pain scores were significantly lower in patients with signs of active inflammation. CRP is the only marker that is significantly more often elevated in patients with acute sacroiliitis or chronic sacroiliitis with exacerbation.



## INDICATIONS FOR RENAL REPLACEMENT THERAPY IN CHILDREN WITH CHRONIC KIDNEY DISEASE

Author: *Edīte Boitmane*<sup>1</sup>

Scientific research supervisor: Dr. *Sandra Derkevica*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Renal replacement therapy, chronic kidney disease, pediatrics.

**Objectives.** Chronic kidney disease (CKD) is a chronic and progressive disease that leads to the initiation of renal replacement therapy (RRT). End-stage CKD is a rare disease in the pediatric population but associated with high mortality and reduced quality of life. These are both laboratory parameters and clinical symptoms, that indicates the initiation of RRT. Patients previously observation from nephrologist leads to more successful treatment of complications and timely initiation of RRT. The main aim is to evaluate the indications for initiating RRT in children with CKD in Latvia from 2009 to 2019.

**Materials and Methods.** Medical histories of 20 patients who initiated RRT at the Children's Clinical University Hospital (CCUH) and Northern Kurzeme regional hospital in the period from 2009 to 2019 were retrospectively studied. Patient demographics, anthropometrics, laboratory tests and objective findings were studied. Data were statistically collected and analyzed with IBM SPSS 26.

**Results.** 20 patients were analyzed – 23.8%(5) girls and 71.4%(15) boys. The mean age at initiation of RRT was 10.20 years (min 4 months; max 17 years). Primary renal diagnosis was: obstructive uropathy/other congenital conditions - 50%(10), end-stage CKD after acute kidney failure - 25%(5), glomerulonephritis – 20%(4), others – 5%(1). Mean creatinine conc. was 477.5 µmol/L (min 168.0; max 1025.0), mean GFR was 12.9 ml/min/1.73m<sup>2</sup> by Schwartz formula. 73%(13) patients had hyperkalemia (mean K 5.8 mmol/L; min 3,87; max 7,72). 60%(12) patients were overhydrated, 70%(14) had arterial hypertension and 30%(6) patients had nausea and vomiting. 15(79%) patients initiated PD, 4(21%) HD and 1 patient received preemptive kidney transplant. 70%(14) of patients were observed by nephrologist more than 3 months before initiating RRT.

**Conclusions.** In the pediatric population RRT is started due to clinical indications and most patients were under the supervision of a nephrologist.

## NON-SUICIDAL SELF-INJURY AMONG CHILDREN AND ADOLESCENTS: PREVALENCE AND POSSIBLE CONTRIBUTING FACTORS

Author: *Marija Terēze Viļumsone*<sup>1</sup>

Scientific research supervisors: Dr. *Urzula Nora Urbāne*<sup>1,2</sup>, Dr. *Nikita Bezborodovs*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Non-suicidal self-harm, adolescents, MFQ, HBSC.

**Objectives.** According to the World Health Organization, suicide is the third most common cause of death among 15 to 19-year-olds. In the EU, Latvia ranks third in terms of the number of suicides per 100 000 inhabitants. One of the risk factors for suicide is non-suicidal self-harm (NSSH). The aim of this study was to determine the prevalence of NSSH and potential influencing factors among children and adolescents.

**Materials and Methods.** A randomized set of 433 5<sup>th</sup> – 12<sup>th</sup> grade students from Rīga and the surrounding area took part in a survey containing a Mood and Feelings Questionnaire (MFQ), as well as a selection of questions from Health Behavior in School-aged Children (HBSC). Data were analyzed using IBM SPSS.

**Results.** One fifth of the participants had committed NSSH during their lifetime and one third had thought about it in the past year. 16.2% of adolescents who had engaged in NSSH at least once in their lifetime had thought about death in the two weeks prior. Significantly higher risk for NSSH was found in children aged 12 – 15 years compared to 16 – 18 (RR 1.359). Most of the respondents inflicting NSSH (82.4%) also knew somebody who had done the same. Significantly higher risk for NSSH was found in those reporting feelings of unhappiness (RR 2.430 95% CI 1.561 – 3.782), guilt (RR 2.238 95% CI 1.626 – 3.081), loneliness (RR 1.961 95% CI 1.378 – 2.789), or concerns about their appearance (RR 1.920 95% CI 1.350 – 2.729).

**Conclusions.** This study showed that the prevalence of NSSH in Rīga region is high but consistent with rates reported in other developed countries. An increased rate of NSSH was observed in the younger age group. Future studies are necessary to research the influence of peers who have experienced NSSH on other adolescents.

# SURGERY

## PARENTAL ANXIETY, KNOWLEDGE AND SATISFACTION IN THE FIELD OF PEDIATRIC SURGERY

Authors: *Deividas Nekrosius*<sup>1</sup>, *Roberta Dievinė*<sup>1</sup>

Scientific research supervisors: Dr. *Ausra Lukosiute-Urboniene*<sup>2</sup>, Dr. *Inga Dekeryte*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup>*Department of Pediatric surgery, Hospital of Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Pediatric surgery, parental anxiety, patient education.

**Objectives.** Child's surgery is stressful event for parents. There are many factors, influencing parental anxiety. Our aim was to determine reasons and level of parental anxiety before child's surgery and factors for successful Doctor-Patient communication.

**Materials and Methods.** This is a prospective observational study. Legal guardian or parent of the patient (child's age 0-15yrs) has answered 2 self-questionnaires: after the consultation of pediatric surgeon in outpatient clinic/emergency department and on the operation day. Parent's anxiety was evaluated with the Visual Analog Scale (100=maximum), Amsterdam Preoperative Anxiety and Information Scale (20=maximum). Possible factors for anxiety (urgency of the surgery, child's age, previous operations, prematurity, parent demographic characteristics) were analysed. Satisfaction with the quality of the given information was evaluated through a numerical scale (0=minimum, 10=maximum).

**Results.** 77 patients' parents were included in the study. The most common reasons for parental anxiety were possible postoperative complications (63%) and the fear of child's reaction after surgery (55%). Multiple regression analysis showed that younger child's age ( $p=0,001$ ) and lower parental education ( $p=0,047$ ) were significant factors for higher anxiety level after initial consultation. Meanwhile younger child's age ( $p=0,07$ ), urgent surgery ( $p=0,023$ ) and lower satisfaction with given pre-operative information ( $p=0,031$ ) were independent factors for higher anxiety level on the operation day. The survey showed that parents were most interested in information about the surgical care benefits, postoperative care and complications. Parental satisfaction was higher in elective surgeries group than in urgent ones ( $p<0,01$ ). Longer waiting time for operation was associated with lower parental satisfaction ( $p<0,001$ ,  $r=-0,536$ ).

**Conclusion.** The most common reason for parental anxiety was possible postoperative complications. The younger child's age, urgency of surgery, lower parental education and dissatisfaction with given information increased parental anxiety. In elective surgeries group parents showed more satisfaction, particularly when the time between consultation and operation was shorter.

## THE ROLE OF CLINICAL EXAMINATION AND ULTRASONOGRAPHY IN THE DIFFERENTIAL DIAGNOSIS AND MANAGEMENT OF PEDIATRIC ACUTE SCROTUM SYNDROME

Authors: *Deividas Nekrosius*<sup>1</sup>, *Ugnė Kaunietytė*<sup>1</sup>

Scientific research supervisors: Dr. *Ausra Lukosiute-Urboniene*<sup>2</sup>, Dr. *Inga Dekeryte*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup>*Department of Pediatric surgery, Hospital of Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Acute scrotum syndrome (ASS), ultrasonography (US).

**Objectives.** Acute scrotal pain in children is a common urological emergency. Differential diagnosis of ASS includes testicular torsion (TT), testicular appendage torsion (TAT), trauma and acute epididymo-orchitis (EO). TT may result in testicular ischemia and necrosis, thereby increasing the risk of infertility if interventions are not performed timely. The aim of the study was to analyze predictive factors for TT.

**Materials and Methods.** A retrospective review of the medical records of patients (age 0-17yrs) with ASS diagnosis was conducted. Following data were reviewed: demographic and clinical features, US findings, time from onset of symptoms to the consultation in the Emergency Department. All patients were divided into 2 groups: patients with TT and other acute scrotum causes (ASC).

**Results.** The study included 235 patients –31.5% TT, 31.9% EO, 29.4% TAT, 7.2% trauma. TT was diagnosed in older age ( $13.8 \pm 2.7$  vs  $10.2 \pm 3.8$ ,  $p < 0.001$ ). 80.6% of TT cases occurred at the age of 13 to 17 years. The median duration of symptoms before arrival at the hospital was shorter in TT group (7.5 vs 24 hours,  $p < 0.001$ ). Multivariate analysis showed that older age ( $p < 0.001$ ), shorter duration of symptoms ( $p = 0.048$ ), palpated hard testis ( $p = 0.01$ ), absence of blood flow ( $p < 0.001$ ) and hypoechoic regions in US ( $p = 0.024$ ) were independent factors for detection of TT. Surgery was performed more often in TT group (89.6% vs 43%,  $p < 0.001$ ). Ten patients (13.7%) with TT underwent orchidectomy. In multivariate regression analysis, orchidectomy was associated with the longer duration of symptoms before surgery ( $p = 0.038$ ), hard testis by palpation ( $p = 0.037$ ) and urological comorbidities ( $p = 0.012$ ).

**Conclusion.** Age around 14 years, short duration of symptoms, hard testicle by palpation, hypoechoic regions and absence of blood flow in ultrasonography are predictive factors for testicular torsion. Long lasting symptoms, hard testis by palpation and urological comorbidities are associated with higher risk for orchidectomy in TT patients.

## FEATURES OF GRANULOMATOUS MASTITIS - SINGLE CENTER EXPERIENCE

Authors: *Darja Stankeviča*<sup>1</sup>, *Ramona Brūvere*<sup>1</sup>  
Scientific research supervisor: Prof. *Arvīds Irmejs*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Head of Breast Unit, Department of Surgery, Latvia*

**Keywords.** Breast, Granulomatous mastitis, treatment.

**Objectives.** Granulomatous mastitis (GM) is a rare disease of unknown aetiology with an autoimmune component that occurs in women of childbearing age on average within 5 years after childbirth. GM visual examination mimics bacterial mastitis with multiple abscesses and/or breast cancer. In case of uncomplicated mastitis conservative management is treatment of choice however symptomatic bacterial infection requires surgical intervention. Aim of the research is to study the management of GM treatment in Pauls Stradiņš Clinical University Hospital (PSCUH), Latvia.

**Materials and Methods.** 15 patients who were diagnosed with GM were treated in PSCUH. Information about age at diagnosis, clinical manifestations, treatment were collected.

**Results.** The mean age of the patients at diagnosis was  $35,9 \pm 5,1$  years. The mean age after childbearing  $2,9 \pm 1,1$  years. The time to completed remission  $4,3 \pm 3,6$  months. A core biopsy was taken to establish the diagnosis in 12 cases. GM treatment included surgery, pharmacological therapy and observation only. Total of 9 patients received surgical treatment – incision with drainage (n=9), excision (n=2). Total of 13 patients received antibacterial therapy, sulfamethoxazolium/trimethoprimium in 13 cases and others antibiotics in 11 cases. Immunosuppression included steroids (n=8), hydroxychloroquine (n=6) and methotrexate (n=2). 1 patient did not receive any treatment.

**Conclusion.** In our cohort GM affects women within 3 years after delivery. Despite of autoimmune pathogenesis of the disease, in majority of cases surgery was performed, which evidence limited experience in the treatment of this rare condition.

## CALCIUM LEVEL DIFFERENCES IN PATIENTS WITH AND WITHOUT PARATHYROID GLAND TRANSPLANTATION IN THYROIDECTOMY

Authors: *Beāte Elizabete Daukšte*<sup>1</sup>, *Darja Mihailova*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Zenons Narbutis*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Hypocalcemia, thyroid surgery, parathyroid gland transplantation.

**Objectives.** Parathyroid gland transplantation is currently used to prevent hypocalcemia in patients with thyroidectomy if the parathyroid gland cannot be saved in the body. Aim of study is to analyze calcium levels between groups of patients with and without parathyroid gland transplantation.

**Materials and Methods.** Retrospective Pauls Stradiņš Clinical University Hospital five years (2016–2020) registry data analysis was performed. Preoperative, on the first postoperative day and one month postoperative after bilateral thyroidectomy, including lymphadenectomy, calcium levels were analyzed and compared for a total of 868 patients; group A (n=784) patients with no parathyroid gland transplantation, and group B (n=84) patients with parathyroid gland transplantation.

**Results.** In group A during surgery were visualised average 3.3 parathyroid glands, in group B - average 2.9. No significant difference was found in groups A and B - preoperative (2.35 vs. 2.38 mmol/L,  $P < 0.001$ ), in first postoperative day (2.08 vs. 2.03 mmol/L,  $P < 0.001$ ), one month after the surgery (2.33 vs. 2.34 mmol/L,  $P < 0.001$ ) median calcium levels in serum. The statistical tests revealed a weak correlation between the number of parathyroid glands and the postoperative changes of calcium levels. In group A and B after discharge ( 27.7% vs. 43.1% ) patients were given calcium substitution, after a month (8.5% vs.19.1%).

**Conclusion.** There was no difference indicated in calcium levels in serum between the two groups of patients. Research shows that the parathyroid gland transplantation has little value in influence of calcium levels in serum.

## RISK FACTORS FOR POSTOPERATIVE ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS GRAFTING

Authors: *Kristīne Dombrovska*<sup>1</sup>, *Agnese Eihenbergā*<sup>1</sup>

Scientific research supervisor: Dr. *Jānis Pavārs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Surgery, Latvia*

**Keywords.** Postoperative atrial fibrillation, potassium, cardiac surgery.

**Objectives.** Postoperative atrial fibrillation (POAF) is the most frequently encountered postoperative complication after cardiac surgery. Studies have shown that POAF increases risk of perioperative stroke, 30-day mortality and have demonstrated an increased risk of POAF in patients with potassium deficiency. However, potassium supplementation is commonly thought to prevent POAF.

**Materials and Methods.** Out of 591 undergoing isolated coronary artery bypass grafting (CABG) at Pauls Stradiņš Clinical University Hospital Center of Cardiac surgery, 204 patients were included in a single center retrospective cohort study from January 1, 2018 till December 31, 2018. Patients were divided in subgroups based on the occurrence of POAF (POAF vs non-POAF). Data was analyzed using IBM SPSS.

**Results.** Out of the 204 patients, 50 (24.5%) developed POAF. In the POAF group, the mean age was  $70 \pm 9$  years vs non-POAF group  $66 \pm 8$  years ( $p=0.02$ ). Moreover, age increases risk of developing POAF ( $OR=1.056$ ;  $p=0.008$ ). 32 (64%) patients in the POAF group had had myocardial infarction vs 75 (48.7%) in the non-POAF group ( $p=0.06$ ). Left atrial enlargement (described as on preoperative echocardiogram as mild or severe LAE) was present in 19 (38%) of the POAF group and 37 (24%) of the non-POAF group ( $p=0.054$ ). Although no statistically significant differences were found between the pre- and postoperative serum potassium levels of the two groups, the POAF group received intravenous rehydration with added potassium chloride (KCl 7.45% 20, 25 or 30mL) to Ringer Lactate or 0.9% NaCl (500 or 1000mL) less than the non-POAF group (27 (54%) vs 91 (59.1%) respectively;  $p=0.032$ ).

**Conclusion.** In our retrospective study, age and LEA were significant risk factors for the development of POAF. Addition of potassium chloride during intravenous rehydration could be a protective factor in regards to POAF, however more trials with postoperative serum potassium levels should be carried out.

## MESH-COVERED (ROADSAVER) STENT AS A NEW TREATMENT MODALITY FOR SYMPTOMATIC OR SIGNIFICANT CAROTID ARTERY STENOSIS: A PILOT STUDY

Authors: *Baiba Ledaine*<sup>1</sup>, *Zane Zarembo*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Kārlis Kupčs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Institute of Diagnostic Radiology, Latvia*

**Keywords.** Carotid artery stenting, Roadsaver stent, carotid artery disease, nitinol double-layer mesh stent.

**Objectives.** With conventional carotid stents, the risk of embolization and periprocedural stroke persists for 30 days. For this reason, it is necessary to refine the carotid stent design. One of the recently introduced new stent designs is the double nitinol layer micromesh self-expandable stent Roadsaver. The aim of the study was to assess 30-day safety and effectiveness of internal and common carotid artery stenting (CAS) using the Roadsaver stent in patients with symptomatic or significant carotid artery stenosis.

**Materials and Methods.** A retrospective analysis of 18 procedures using the Roadsaver stent in patients, who underwent CAS in Pauls Stradiņš University Hospital from August 2019 till October 2020 and 30-day follow-up with carotid duplex ultrasound (DUS). Statistics were performed on IBM SPSS 26, level of statistical significance was set at  $p < 0.05$ .

**Results.** The patients were male ( $n = 10$ ) and female ( $n = 8$ ); mean age was  $68 \pm 8.16$  years. In the last 6 months before CAS 4 patients had TIA and 2 patients had stroke of ipsilateral hemisphere. Femoral access was used in all cases. The Roadsaver stents (nominal diameter 7, 8 or 9 mm, length 20, 25, 30, 40 mm) were implanted successfully in the left ICA ( $n = 5$ ), right ICA ( $n = 6$ ), left CCA bifurcation ( $n = 4$ ), right CCA bifurcation ( $n = 3$ ). The length of the stenotic segment was from 3 to 80 mm (mean: 18.33 mm). No adverse events and device deficiency/malfunction occurred during and after procedure. Stenosis decreased from  $69.94 \pm 19.83\%$  (range: 40–99%) to  $7.5 \pm 9.11\%$  (range: 0–20%) ( $Z = -3.742$ ,  $p < 0.001$ ). One significant in-stent restenosis was observed on 30-day follow-up DUS.

**Conclusion.** The CAS using the Roadsaver stent seems to be safe and effective. Further studies involving larger patient populations are needed.



## CHRONIC PANCREATITIS SURGICAL COMPLICATIONS AND TREATMENT OPTIONS: A TEN YEAR ANALYSIS IN RĪGA EAST UNIVERSITY HOSPITAL

Authors: *Marika Reinicāne*<sup>1</sup>, *Natālija Mihailova*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Haralds Plaudis*<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Surgery, Latvia*

<sup>3</sup> *Rīga East University Hospital, Clinical Centre Gailezers, Department of Surgery, Latvia*

**Keywords.** Chronic pancreatitis, complications, surgical procedures, operative, surgery.

**Objectives.** Chronic pancreatitis (CP) is a multifaceted, progressive, fibro-inflammatory process of the pancreas which leads to irreversible changes. The structural changes result in significant complications such as abdominal pain and loss of gland exocrine and endocrine functions. Treatment is centred on a conservative approach, surgery is indicated in many patients due to the progression of the CP complications to improve the quality of life. The aim of the study was to investigate and analyse CP complications and surgical options in the Rīga East University Hospital (REUH).

**Materials and Methods.** The retrospective cohort study included 302 patients with CP complications who underwent surgery and were admitted to REUH between 2010-2020. The data has been collected from medical records and analysis was done with IBM SPSS Statistics 22.

**Results.** 302 patients were enrolled, 93% of them had CP and 7% presented with pancreatic pseudotumors. The average age of a patient was 48,9 years (IQR=11,7) from which 77,2% (N=233) were men. Most patients had a history of abdominal pain 83,8% (N=253). 55,6% had therapy of pancreatic enzyme replacement and 22,5% had endocrine insufficiency. Based on the obtained data and the criteria, we evaluated the M-ANNHEIN clinical staging of CP. Most patients had the second stage 43,7% (N=132). The most common reason for surgical treatment was pseudocysts, therefore the surgical drainage was performed 45,48% (N=171). Open or laparoscopic surgical drainage were conducted 24,2% (N=91), percutaneous drainage 21,28% (N=80). Average time of a stay at the hospital for operated patient was 15,8 days, but in the ICU about 2,1 day. Postoperative complications were observed in 8,3% patients, 30,8% of them had postoperative bleeding. Mortality rate during hospital admission detected 1,7% (N=5), most common causes were severe comorbidities 60% (N=3).

**Conclusion.** This study demonstrated successful outcomes associated with medium-term hospital admissions, low postoperative complications, mortality incidents and the improvement of the quality of life.

## DIAGNOSTIC ACCURACY OF PROSTATE CANCER DIAGNOSTIC USING TRANSPERINEAL MRI/US FUSION PROSTATE BIOPSIES. INITIAL EXPERIENCE

Authors: *Vladislavs Janšins*<sup>1</sup>, *Sofija Strutinska*<sup>1</sup>

Scientific research supervisors: Dr. *Juris Jansons*<sup>2</sup>, Dr. *Alberts Belovs*<sup>2</sup>,  
Asoc. Prof. *Vilnis Lietuvietis*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Urology, prostate, cancer, biopsy, transperineal biopsy, fusion biopsy.

**Objectives.** Transrectal US guided prostate biopsy has been the golden standard of prostate cancer (PC) diagnostics for several decades. Literatures reviews on comparison between Transrectal US guided biopsies and post-surgery material show an upgrade of diagnosis in 30-43% of cases, having concordance of diagnosis only 60% of cases. In recent years there is a growing interest in MRI/US fusion biopsies which could increase accuracy of PC early detection. The aim of this study was to evaluate efficacy of transperineal MRI/US fusion biopsies.

**Materials and Methods.** This is retrospective, one center experience obtained in a time period from 2019 to 2020. Patients and procedure data were gathered from men who underwent radical retropubic prostatectomy after diagnosed with transperineal MRI/US fusion biopsy using BK Fusion technologies. Biopsy and post-surgery histological reports were compared. For statistical analysis IBM SPSS 22 was used.

**Results.** 33 men were eligible and recruited for this study. Average age of the patient was  $62.8 \text{ SD} \pm 5.37$  years, with average PSA level of  $10.29 \pm 7.18$  ng/ml and average prostate volume of  $45.13 \pm 16.9$  cm<sup>3</sup>. Average pre-surgery International Society of Urological Pathology grade (ISUP) group was  $1.94 \pm 0.79$ . In 15% (n=5) cases ISUP grade group upgraded by  $1.8 \pm 0.84$ . In 6% (n=2) cases downgraded, by  $1.5 \pm 0.7$ . Concordance of diagnosis was estimated to be 79%.

**Conclusion.** MRI/US fusion biopsies increase concordance of diagnosis, therefore increase accuracy of prostate cancer diagnostics. Results of this study are comparable to other research done in the field.

## IN PURSUIT OF ADEQUATE PREDICTION TOOL FOR WEIGHT LOSS AFTER BARIATRIC TREATMENT

Author: *Izabela Karpińska*<sup>1</sup>

Scientific research supervisor: Prof. *Piotr Major*<sup>2</sup>

<sup>1</sup> *Jagiellonian University Medical College, Poland*

<sup>2</sup> *Jagiellonian University Medical College, Department of General Surgery, Poland*

**Keywords.** Risk prediction models, external validation, weight loss, bariatric surgery.

**Objectives.** Bariatric surgery is the most effective obesity treatment. Weight loss varies among patients and not everyone achieves desired outcome. Identification of predictive factors for weight loss after bariatric surgery resulted in several prediction tools proposed. We aimed to validate the performance of available prediction models for weight reduction 1 year after surgical treatment.

**Materials and Methods.** The retrospective analysis included patients after Roux-en-Y gastric bypass (RYGB) or sleeve gastrectomy (SG) who completed 1-year follow-up. Postoperative body mass index (BMI) predicted by 12 models was calculated for each patient. The correlation between predicted and observed BMI was assessed using linear regression. Accuracy was evaluated by squared Pearson's correlation coefficient ( $R^2$ ). Goodness-of-fit was assessed by standard error of estimate (SE) and paired sample t test between estimated and observed BMI.

**Results.** Out of 760 patients enrolled 509 (67.00%) were women with median age 42 years. 65.92% of patients underwent SG and 34.08% had RYGB. Median BMI decreased from 45.19kg/m<sup>2</sup> to 32.53kg/m<sup>2</sup> after 1 year. EWL amounted to 62.97%. All models presented significant relationship between predicted and observed BMI in linear regression (correlation coefficient between 0.29 and 1.22). The best predictive models explained 24% variation of weight reduction (adjusted  $R^2=0.24$ ). Majority of models overestimated outcome with SE 5.03kg/m<sup>2</sup> to 5.21kg/m<sup>2</sup>.

**Conclusion.** Although predicted BMI had reasonable correlation with observed values, none of evaluated models presented acceptable accuracy. All models tend to overestimate the outcome. Accurate tool for weight loss prediction should be developed to enhance patients assessment.

## ADOPTION AND IMPLEMENTATION OF SURGICAL SAFETY CHECKLIST IN THE DEPARTMENT OF SURGERY AT THE HOSPITAL OF LUHS KAUNAS CLINICS

Authors: *Deimantė Krutulytė*<sup>1</sup>, *Žygimantas Žumbakys*<sup>1</sup>  
Scientific research supervisor: Prof. *Žilvinas Dambrauskas*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Medical Academy, Lithuania*

<sup>2</sup>*Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Surgical safety checklist, adoption of guidelines, quality assurance.

**Objectives.** The World Health Organization Surgical Safety Checklist (WHO SSC) is linked to reduced mortality, improved outcomes, and teamwork. Our objectives were to assess the attitudes of doctors and nurses towards the adoption of WHO SSC and the need for local modification of the checklist in the Department of Surgery (LUHS KC).

**Materials and Methods.** A cross-sectional study was conducted at the Department of Surgery during December 2019. OR and anesthesia nurses, surgeons, anesthesiologists answered a questionnaire about WHO SSC. Data analysis was performed with MS Excel. Qualitative data were given in absolute value and percentage (%). After testing, an adapted checklist was approved in October 2020. Original WHO SSC was made of 19 items. We disaggregated them into 28 items (e.g. “Has the patient confirmed his/her identity, site, procedure, and consent?” = 4 single elements) and compared with an adapted checklist.

**Results.** The study involved 43 respondents: 34.9% (n=15) nurses and 65.2% (n=28) doctors. While evaluating the opinion whether a checklist causes an unnecessary time delay - 66.7% (n=10) nurses vs 4% (n=1) doctors agreed, 20% (n=3) vs 88% (n=25) did not agree, others were not sure. When asked if the checklist improves patient safety, 95.3% (n=41) thought yes, 4.7% (n=2) were not sure. Also, 93% (n=40) respondents admitted that usage of a checklist may improve communication and teamwork. According to 93% (n=40) respondents (80% (n=12) nurses, 100% (n=28) doctors), they would want the checklist used if they were having an operation. 6 WHO SSC items were deleted, 9 added and 5 modified in the adapted checklist (the checklist grew in size).

**Conclusion.** The majority of respondents thought that WHO SCC improves patient safety and teamwork. However, more than half of nurses believed that checklist causes an unnecessary time delay. Overall, the adapted checklist grew in size.

## COMPARISON OF KIDNEY GRAFT QUALITY IN MULTI-ORGAN DONORS VS KIDNEY-ONLY DONORS

Authors: *Žanis Bordo*<sup>1</sup>, *Alberts Broders*<sup>1</sup>, *Arta Alksnīte*<sup>1</sup>  
Scientific research supervisor: Assist. Prof. *Aleksandrs Maļcevs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Center of Transplantology, Latvia*

**Keywords.** Kidney transplantation, kidney graft, multi-organ donor, kidney-only donor, graft function.

**Objectives.** Kidneys are most commonly obtained from deceased donors, which can be either kidney-only donors (KOD) or multi-organ donors (MOD), which significantly differ in the time of ischemia. Our aim was to determine whether this difference affects the outcome of the graft functionality and if there should be any method improvements considered. Such findings could assist in creating more suitable donor-recipient pairs and help maximise full potential of the grafts.

**Materials and Methods.** A retrospective study, conducted by analyzing clinical records of 82 donors and 146 recipients in PSKUS from 2016 to 2019. Data was statistically analyzed using IBM SPSS Statistics 26.

**Results.** The mean donor age in the KOD group is  $55.8 \pm 1.1$ , in the MOD group -  $39.5 \pm 2.1$ . The mean time of donor preparation for organ explantation in the KOD group is  $7.1 \pm 0.7$  hours, in the MOD group -  $12.4 \pm 1.1$  hours, and the mean time of organ preparation for explantation is  $1.3 \pm 0.3$  and  $2.3 \pm 0.1$  hours, respectively. The graft function in KOD and MOD groups: primary - 81.3% and 78%, delayed - 16.7% and 18%, no function - 2% and 4%, respectively. The mean creatinine results of recipients in KOD and MOD groups: after 1wk  $211.8 \pm 20.1$  and  $162.2 \pm 17.6$ , after 6mo  $156.0 \pm 12.7$  and  $125.4 \pm 6.7$ . All  $p > 0.05$ .

**Conclusion.** There are no statistically significant differences in the results of kidney graft function between the two groups. Although the time of donor preparation is twice as high in the MOD group, laboratory analysis indicate that the grafts received from this group function slightly better, however, this may be due to the donor age difference. To draw a thorough conclusion, more extensive studies should be carried out.

## DIABETES MELLITUS INFLUENCE ON INFECTIOUS COMPLICATION RATE AFTER A MAJOR LOWER LIMB AMPUTATIONS

Authors: *Zigurds Tamans*<sup>1</sup>, *Matīss Dravnieks*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Arnolds Jezupovs*<sup>1</sup>

<sup>1</sup> *University of Latvia, Latvia*

**Keywords.** Diabetes mellitus, atherosclerosis, lower limb amputations, infectious complications.

**Objectives.** To find out if diabetes mellitus influences infectious complications frequency in patients after a major lower limb amputations due to the atherosclerotic gangrene.

**Materials and Methods.** A prospective, randomized study includes patients with a major lower limb amputations treated in Rīga East University Hospital Medical Centre “Bīķernieki”, Rīga, Latvia. We assessed patients with atherosclerosis who had diabetes mellitus and patients with atherosclerosis who did not have diabetes mellitus after lower limb amputation. Demographic data, total infectious complications, was analyzed. Statistical analysis was performed with SPSS 22.0 by using Pearson’s Chi-square test and binary logistical regression. The level of statistical significance was set at  $p < 0.05$ .

**Results.** 169 patients were initially selected for the study: 58.9% (n=99) were males, 41.1% (n=69) – females. Mean patient age 74.94 (21-95) years. 35.1% (n=59) had diabetes, 64.9% (n=109) had atherosclerosis. Total infectious complications were 20.2% (n=34) of which local infectious complications were 8.9% (n=15) and systemic infectious complications 11.3%(n=19). In Pearson’s Chi-square test between diabetes mellitus and total infectious complications result was statistically insignificant ( $\chi^2 = 0.001$ ,  $df=1$ ,  $p=0.981$ ), analyzing diabetes mellitus and local complications there was no difference between the groups ( $p=0.865$ ), also there was no difference between diabetes mellitus and systemic infections ( $p=0.867$ ). Binary logistic regression analysis showed that diabetes mellitus (OR=1.010, 95% CI 0.459 – 2.220,  $p=0.981$ ) was not significantly associated with infectious complications.

**Conclusion.** Diabetes mellitus did not influence infectious complication rate in patients after a lower limb amputations. Infectious complication rate was not different for patients who had diabetes mellitus compared with patients without diabetes mellitus.

## SURGERY VERSUS BALLOON ANGIOPLASTY FOR TREATING COARCTATION OF AORTA: A META-ANALYSIS

Authors: *Helly Thakkar*<sup>1</sup>, *Avichal Dani*<sup>1</sup>

Scientific research supervisor: Dr. *Dani Sameer*<sup>2</sup>

<sup>1</sup> *NHL Municipal Medical College, India*

<sup>2</sup> *Apollo CVHF Heart Institute, India*

**Keywords.** Coarctation of aorta, surgery, balloon angioplasty, aneurysm.

**Objectives.** To compare the clinical outcomes in patients having coarctation of aorta undergoing surgery versus balloon angioplasty.

**Materials and Methods.** We conducted a database search of the MEDLINE, Embase and Cochrane Central Register of Controlled Trial and RCTs till 1st September 2020 were included following PRISMA guidelines after being with matched with inclusion and exclusion criteria. 13 RCTs were included with 537 patients undergoing surgery and 340 patients undergoing balloon angioplasty. We used the MESH strings such as 'coarctation of aorta', 'surgery', 'balloon angioplasty', 'aneurysm'.

**Results.** Meta-analysis showed that surgery was associated with a significant increase in severe complications (OR = 1.993, 95% CI = 1.126–3.527, p=0.018). However, it was also associated with decrease in post-op aneurysm (OR = 0.32, 95% CI = 0.144–0.710, p=0.005) and recoarctation (OR = 0.375, 95% CI = 0.268–0.524, p<0.001).

**Conclusion.** Although surgery results in increased risk of severe complications, it also at the same time, reduces the incidences of post-op aneurysms and recoarctations.

## CHARACTERISTICS AND MANAGEMENT OF LIVER ABSCESS

Authors: *Tatjana Ivanova*<sup>1</sup>, *Jelizaveta Stepanova*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Artūrs Ozoliņš*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Surgery, Latvia*

**Keywords.** Liver abscess, risk factors, percutaneous/surgery drainage, antibacterial therapy.

**Objectives.** Liver abscess (LA) is a common intraabdominal pathology mostly caused by pyogenic infection. It may be potentially life-threatening without appropriated management. The aim of the present study was to determine clinical and laboratory characteristics of patients with LA as well as evaluate their therapy options.

**Materials and Methods.** This retrospective-prospective study included 51 patients with diagnosis of LA who were treated in Clinical University hospital in the time period from 2018 to 2020. The diagnosis was based on clinical symptoms, radiological and microbiological findings. We analysed clinical characteristics, risk factors, radiological results and treatment management of LA.

**Results.** Analyzing the total number of patients with diagnosis of LA (n=51) - 49% were women and 51% were men; mostly among individuals with median age 68. The clinical features were abdominal pain (73%), fever (71%), weakness (22%), vomiting (8%). The risk factors were detected for 55% of patients (n=28): biliary tract disease - 79%, diabetes mellitus type 2 - 43%, pancreatitis - 14% and alcoholism - 7%. The pyogenic liver abscess was found in 73% (n=38) and most frequently was induced by *Klebsiella pneumoniae* - 58% (n=22). The most common affected liver lobe was right - 57%. Solitar abscess was in 55% of cases and multifocal abscess - in 45%. LA was complicated by bacteriemia in 18% of cases. All patients received antibacterial therapy according to microbiological findings. Percutaneous drainage was used in 72,5% (n=37), surgical drainage - in 13,7% (n=7), both methods - in 9,8% (n=5) and only antibacterial therapy - 4% (n=2).

**Conclusion.** The present study may draw attention from clinicians to pay attention to LA in patients with non-specific symptoms for early diagnosis and successful therapy. LA treatment should involve multidisciplinary team with possibilities to do minimally invasive procedures as well as surgical operations.



## VIDEO-ASSISTED THORACOSCOPIC SURGERY VERSUS CHEST TUBE DRAINAGE: OPTIMAL APPROACH FOR TREATMENT OF PLEURAL EMPYEMA

Author: *Alina Tomova*<sup>1</sup>

Scientific research supervisor: Dr. med. *Artjoms Špaks*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Early stage pleural empyema, loculated effusion, chest tube drainage (CTD), Video-assisted thoracoscopic surgery (VATS).

**Objectives.** Pleural empyema is a dynamic triphasic process, thus diagnosis, staging and treatment might be challenging. With a variety of management modalities, there is no consensus or official guidelines available. Whilst VATS surgery for empyema gains increasing popularity, CTD usually remains the first choice treatment. This study aims to evaluate CTD versus VATS for second stage empyema in order to identify an optimal primary treatment approach. Primary outcomes for assessment were treatment failure rate, complications, length of hospital stay, secondary intervention, treatment related mortality.

**Materials and Methods.** Retrospective observational single-centre study of patients with fibrinopurulent stage of empyema whose treatment was initiated with CTD or VATS from January 2017 until October 2020.

**Results.** Totally 55 patients were admitted with second stage of pleural empyema. 18 patients were initially treated with CTD (33%) and 37 patients underwent VATS (67%). There was no statistically significant difference between groups based on age, sex, etiology, empyema side and assessment of clinical symptoms. Treatment failure in CTD group was significantly higher than that of VATS (89% vs. 0%;  $p < 0.05$ ). In comparison to CTD, VATS group had shorter hospital stay (17 vs. 21 days,  $p < 0.05$ ) and shorter tube drainage duration (5 vs. 9 days,  $p < 0.05$ ). Three VATS patients had postoperative bleeding (8.1%), and two patients (7%) required ventilation for > 7 days due to deterioration of general condition. Due to conservative nature of CTD treatment major complications were not encountered in this group.

**Conclusion.** VATS should be considered as an optimal primary treatment approach for second stage empyema due to its higher efficacy, improved outcomes, shorter hospital stay, low invasiveness and fewer complications compared to widely used CTD. Fit for surgery patients with empyema should be referred to thoracic surgeon.

## BRONCHIAL ARTERY EMBOLISATION IN HEMOPTYSIS - TECHNICAL ASPECTS AND CLINICAL RESULTS

Authors: *Zane Zaremba*<sup>1</sup>, *Baiba Ledaine*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Kārlis Kupčs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Institute of Diagnostic Radiology, Latvia*

**Keywords.** Hemoptysis, a. bronchialis, embolisation.

**Objectives.** Massive hemoptysis is a potentially life-threatening medical emergency with high mortality rates. The main bleeding source in 90% is determined to be aa. bronchiales. Bronchial artery embolization (BAE) has become a cornerstone in severe hemoptysis treatment. Immediate clinical success described as termination of hemorrhage ranges from 85-100%, rebleeding ranges 10-33%. Major complications are rare. The main objective of this study was to evaluate the success rate, complications and technical aspects of BAE in Latvia.

**Materials and Methods.** Retrospective material analysis of 16 patients, who underwent bronchial artery embolisation in Pauls Stradiņš Clinical University hospital January 2016 - October 2020 due to episode/-s of clinical, severe hemoptysis. Statistical analysis of the data performed with Microsoft Excel and SPSS software.

**Results.** In all patients immediate clinical success was reached (100%) and the bleeding was stopped. No complications were faced during the procedure. 19% (n=3) of the patients underwent more than one bronchial artery embolization. In 25% of cases rebleeding occurred. In 6% - during first month after procedure, in 12.5% 1-3 months after BAE and in 6% >1 year after procedure. In 50% the cause was malignancy; 13% Bronchiectasis disease, Hops; 6% (n=1) Castleman disease, 6% arterial blood flow anatomical anomaly, 6% aspergillosis. 6% Anticoagulants and 13% cryptogenic origin. In 75% (n=12) BAEs polyvinyl alcohol particles were used (PVA). In 2 of which Hystoacril glue was added and in 3 of which embolisation coil was added, in 25% only Hystoacril glue was used. In 69% a. bronchialis dextra was embolised; in 25% a. bronchialis sinistra, in 6% both bronchial arteries.

**Conclusion.** According to the results of this study Bronchial artery embolisation has proven itself as life-saving procedure with very high immediate rate of success here in Latvia, recurrent hemorrhages in 1/4 and no major complications.

## RESULTS OF EXTRALEVATOR ABDOMINOPERINEAL EXCISION OF LOW RECTAL CANCER PERFORMED IN LATVIA

Author: *Olga Rimdenoka*<sup>1</sup>

Scientific research supervisors: Dr. med. *Jānis Zariņš*<sup>2</sup>, Dr. med. *Guntis Ancāns*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Department of Hand and Plastic Surgery, Microsurgery Centre of Latvia, Latvia*

<sup>3</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Rectal cancer, ELAPE, APE.

**Objectives.** Extralevator abdominoperineal excision (ELAPE) is a quite new method for low rectal cancer radical treatment – only 11 patients in Latvia have received it. ELAPE is more extensive compared to the conventional method – abdominoperineal excision (APE), thus some studies associate ELAPE with more frequent complications, but also with smaller number of positive resection margins than APE. The aim of the study was to describe the results of ELAPE performed in Latvia, and to compare them to the results of APE.

**Materials and Methods.** The study group included 11 patients, who underwent ELAPE, meanwhile the control group included 10 patients, who were treated with APE. All were diagnosed with low rectal cancer. Fisher's Exact One-Sided and Mann-Whitney U tests were performed via IBM SPSS 26.0.

**Results.** The median age in the study group was 54 years (7 males, 4 females), meanwhile in the control group it was 63 years (5 males, 5 females). Overall, 5 patients were younger than 50 years. All resection margins after ELAPE were negative, meanwhile after APE – 10% were positive. In ELAPE soft tissue defects in 64% of cases were reconstructed with vertical rectus abdominis musculocutaneous flap, in 36% – with other reconstruction method. Complications occurred in 36% of ELAPE, and in 50% of APE. 20% of APE complications required reconstruction with a flap. Although, the difference between the frequency of complications and the time of hospitalization after ELAPE and APE was not statistically significant.

**Conclusion.** Even though ELAPE is more extensive, the frequency of complications and hospitalization time is the same as in case of APE. All resection margins in ELAPE are negative, meanwhile in APE a positive resection margin is observed. According to this study, ELAPE can be suggested as an option for low rectal cancer treatment to avoid positive resection margins.

# PSYCHOLOGY

## EXPLORATION OF THE PSYCHOLOGICAL EXPERIENCE OF THE TRANSATLANTIC SAILING

Author: *Laura Regzdiņa-Pelēke*<sup>1</sup>

Scientific research supervisors: Prof. *Kristīne Mārtinsone*<sup>2</sup>, Prof. *Anita Pipere*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Health Psychology and Pedagogy, Latvia*

**Keywords.** Dynamic of the psychological experience, psychological experience, qualitative approach, transatlantic sailing.

**Objectives.** This study pertains to the new field of psychological research in Latvia and aims to explore the phenomenon of the psychological experience of transatlantic sailing. Additionally, the dynamic of the psychological experience during the sailing was contemplated.

**Materials and Methods.** Four Latvian citizens with different sailing experience (1 female, 3 males), aged 36-68 years old, participated in the study. In line with the qualitative research approach, data were obtained by using semi-structured interviews before and after sailing and by individual travel diaries. Diaries completed by each sailor contained reflection on daily sailing experience by freehand drawings of self-portraits or something important during the day, and answers to the open questions. After the sailing, an individual semi-structured graphic elicitation interview was conducted with each participant. The main themes and subthemes of the experience were identified by inductive thematic analysis complemented with a frequency analysis.

**Results.** Themes before journey related to previous sailing experience, identity as a sailor, sailing motivation, preparation for transatlantic voyage, existential experience and transcendence, nature, crew members, psychological and physical self, meaningfulness; themes revealed from travel diaries were about spending time on board, social relationships, connection and relationships with nature, sailing equipment, psychological and physical self, existential experience and transcendence; while after sailing interviews revealed also such categories as intentions, resources, meaningfulness, unusual and transcendent experience, specific place, environment and time experience.

**Conclusions.** The results offered an opportunity to see varied information about the phenomenon of the psychological experience during the transatlantic sailing – psychological experience of the human being in a specific context and environment.

## BALANCED TIME PERSPECTIVE IN REMOTE ENVIRONMENT

Author: *Sanda Šalma*<sup>1</sup>

Scientific research supervisors: Prof. *Kristīne Mārtinsonē*<sup>2</sup>, PhD. *Ervīns Čukurs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Health Psychology and Pedagogy, Latvia*

**Keywords.** Balanced time perspective, conscientiousness, emotionality, extraversion, job level, job satisfaction, remote work.

**Objectives.** Previous research shows that balanced time perspective (BTP) explains additional variance in job satisfaction beyond the one explained by personality traits (Bajec, 2018). Stolarski (2016) research results provide an evidence for the moderating role of balanced time perspective on the well-established relationships between both extraversion and neuroticism, and well-being. The correlation between well-being and job satisfaction is proven in previous studies (Sironi, 2019). The present research aims to explore the relationships between BTP, extraversion, emotionality, conscientiousness, job satisfaction and job level as a relevant attribute in organisational psychology.

**Materials and Methods.** A sample (N=181, age 21–60) was recruited by using a snowball method within IT, finance and professional services sector international companies in the Baltic states and several countries in Eastern Europe. These were organisations with English as a working language where employees are given opportunity to work remotely. Data pack combined questions of Swedish version of Zimbardo Time Perspective Inventory (S-ZTPI, Carelli & Wiberg, 2011), Job Satisfaction Survey (JSS, Spector, 1985), HEXACO-60 (Ashton & Lee, 2009) and demographic questionnaire.

**Results.** Pearson's correlations between BTP and other measured variables showed the following results: job level ( $r=.29$ ), job satisfaction ( $r=.32$ ), extraversion ( $r=.60$ ), conscientiousness ( $r=.25$ ), emotionality ( $r=-.24$ ) in the remote work settings at the  $p<.001$  level. The results indicated statistically significant positive correlation between BTP and job level, job satisfaction, extraversion and conscientiousness, as well as statistically significant negative correlation between BTP and emotionality.

**Conclusions.** As a next step it would be useful to research the direct and indirect relationships among all the before-mentioned variables to draw more concise conclusions and interventions to increase BTP in a remote workplace. If BTP correlates with job satisfaction, it might be beneficial to work on creation of specific interventions to increase BTP of employees.

## ARTS THERAPISTS VIEWS ON THE ORGANIZATION OF ARTS THERAPIES PRACTICE WITH THE CHILDREN PATIENT/CLIENT GROUP IN LATVIA

Author: *Līva Kupča*<sup>1</sup>

Scientific research supervisor: Prof. *Kristīne Mārtinsonē*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Arts therapies practice, children patient/client group, organization of psychological help practice.

**Objectives.** Arts therapists in Latvia are healthcare professionals who provide psychological help to children across several work environments including healthcare, social services, educational institutions, and private practice (Paiča et al., 2014). This study aims to find out what practicing arts therapists consider to be main aspects of the organization of their arts therapies practice with the children patient/client group in Latvia.

**Materials and Methods.** Semi-structured interviews were conducted online in the form of a focus group (n=4) and an individual interview (n=2). Participants were selected from four arts therapy specializations (art, music, drama, dance and movement therapy), were certified and had experience working with children in different work settings. After the literature review, there were four broad questions posed to arts therapists concerning different aspects of the organization of their practice with children. Interviews were recorded, transcribed and analyzed using thematic analysis (Braun&Clarke, 2006).

**Results.** Arts therapists identified several aspects of the organization of their arts therapies practice with children face to face and online which can be described in terms of 5 main themes – the organization of arts therapies practice within the requirements of a specific work environment, the organization of arts therapies sessions, arts therapists cooperation with the other professionals, the cooperation and communication between arts therapist and the child's parents, the collaboration between arts therapist and the child.

**Conclusions.** As each of the working environments has its own requirements, the organization of arts therapists practice differs across work settings. The findings show that the organization of arts therapies practice with children can be described in several aspects. These aspects will be used in future research to build an arts therapists survey to gather quantitative data of how the organization of arts therapies practice with children differs in different working environments.

## RELATIONSHIP BETWEEN NEUROTICISM AND COGNITIVE RESERVE IN OLDER ADULTS

Author: *Linda Karole*<sup>1</sup>

Scientific research supervisor: Mag. Psych. *Kristīne Šneidere*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Reaction time/information processing speed, neuroticism, cognitive processes, cognitive reserve, aging.

**Objectives.** The aim of the study was to examine the correlation between neuroticism and cognitive reserve in practically healthy adults over 65 years of age.

**Materials and Methods.** The study included a total of 70 older adults, aged 65-85, of which 49 respondents were included in the data processing ( $M = 72,10$ ,  $SD = 5,16$ ). Inclusion criteria involved native Latvian speakers, with no self-reported significant illnesses that might impact research task results, or limit their ability to participate. The personality trait "Neuroticism" and its subscales "depressivity", "stress resistance", "anxiety" and "shyness" were assessed with the *Latvian Personality Survey* (Perepjolkina & Reņģe, 2014), while *Cognitive Reserve Index questionnaire* (Nucci, Mapelli, & Mondini, 2012) was used to evaluate cognitive reserve of each individual participant. Data acquisition was conducted with each participant individually, frontally.

**Results.** The results indicated statistically weak, negative correlations with cognitive reserve subindices "CRI-Work experience" and personality sub-trait "depressivity" ( $r_s = -.35$ ,  $p < .05$ ), while subindice "CRI-Leisure time" showed a negative close relationship with personality sub-trait "stress resistance" ( $r_s = -.39$ ,  $p < .01$ ), as well as with the personality trait "neuroticism" ( $r_s = -.40$ ,  $p < .01$ ).

**Conclusions.** The results showed a potential relationship between cognitive reserve and neuroticism as a personality trait, indicating that people who are more actively involved in leisure time activities, will also show lower levels of neuroticism and have better stress resistance abilities. Also, people with higher level occupations might present with lower levels of depressivity as a personality trait. Extensive studies would be beneficial to better understand this association, which could be crucial when developing healthy ageing plans.

## FACTORS AFFECTING THE FORMATION OF THE COMPONENTS OF THE THERAPEUTIC ALLIANCE, PATIENT/CLIENT-THERAPIST BOND AND MUTUAL COLLABORATION IN ARTS THERAPIES.

Author: *Alvīne Milere*<sup>1</sup>

Scientific research supervisor: Prof. *Kristīne Mārtinsonē*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Health Psychology and Pedagogy, Latvia*

**Keywords.** Arts therapies, factors affecting the therapeutic alliance, patient - therapist bond, therapeutic alliance, therapeutic relationships.

**Objectives.** In literature, therapeutic alliance (TA) is defined as general bond between the patient/client and the therapist that is developed during the therapeutic process, and is being described as that is one of the most important factors underlying any therapeutic relationships. This study aims - to determine how arts therapists practicing in Latvia describe factors affecting the formation of the components of the TA, patient/client- therapist bond and mutual collaboration.

**Materials and Methods.** Nine participants were selected to take part in an online focus group discussion. Participants were certified, had practiced for at least two years, represent different arts therapies specializations and different working environments. For data analysis, thematic analysis (Braun & Clarke, 2006) was applied, using data analysis software NVivo.

**Results.** After thematic analysis, 30 factors were identified and divided into four themes: 1) Arts therapist-dependent factors; 2) Patient/client-dependent factors; 3) factors dependent on mutual collaboration; 4) contextual factors. The following factors affecting formation of the components of the TA, patient/client-therapist bond and mutual collaboration, were identified as the most relevant subthemes (based on frequency): 1) therapist's ability to respond to the needs of a patient/client; 2) safety; 3) needs of a patient/client; 4) motivation of a patient/client; 5) patient/client's previous experience of interpersonal relationships; 6) non-verbal communication and experience; 7) online/ face-to-face therapy format; 8) child's parents (if patient/client is child).

**Conclusions.** Diverse factors affecting formation of the components of the TA, patient/client-therapist bond and mutual collaboration, were identified and divided into four groups, however, research participants have characterized factors, identified in each group, not homogeneously, emphasizing different unrelated contextual factors. In future studies, it would be important to identify differences of these factors working face-to-face and online, as well as differences between various arts therapies specializations.



## CONNOR-DAVIDSON RESILIENCE SCALE (CD-RISC-25) VALIDATION IN LATVIA

Author: **Gunita Skaldere-Darmudasa**<sup>1</sup>

Scientific research supervisor: Assist. Prof. **Velga Sudraba**<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Resilience, resilience assessment, resilience scale, psychometric property.

**Objectives.** The aim of the research was to adapt the full version of the Connor-Davidson Resilience scale (CD-RISC-25) in Latvia to gain a qualitative and valid psychological measure of assessing resilience. Connor-Davidson Resilience Scale is translated in 75 different languages and its validation is proved in clinical and general samples showing good internal consistency  $\alpha = 0,89$  (Connor & Davidson, 2003). Studying the scientific literature has shown the multidimensional nature of resilience construct as well as broaden the knowledge about resilience as a complicated psychological construct which can be affected by different factors rising from one's individual experience and environment where he comes from. Permission to adapt CD-RISC-25 was received after successful communication with the authors of the scale.

**Materials and Methods.** Sample of 186 economically active Latvian speaking people in age range 18 to 69 years old ( $M=37,65$ ;  $SD = 12,07$ ), 75,8% females, 24,2% males. Participants filled demographic data questionnaires (gender, age, education,) and Connor-Davidson Resilience Scale (CD-RISC-25, Connor & Davidson, 2003). The scale of 25 items, each rated in 5 points Likert scale (0-4), with higher scores reflecting greater resilience.

**Results.** Cronbach's Alpha for all items varies from 0,88 to 0,90 and for scale total  $\alpha = 0,89$ , which proves good internal consistency. The item-difficulty index shows that item 1 slightly exceeds the limited range of 0,8 to 3,2 being 3,37. All of the items reach the item-discrimination index range of 0,2 to 0,8 (Rascevska, 2005).

**Conclusions.** The Connor-Davidson Resiliency Scale in the Latvian sample showed high internal consistency  $\alpha = 0,89$  and good psychometric properties, same as noted in other studies (Connor & Davidson, 2003). This proves CD-RISC-25 as qualitative and a valid measure for further studies of resilience in the Latvian population.

## RELATIONSHIP BETWEEN ILLNESS PERCEPTION AND SOCIODEMOGRAPHIC VARIABLES IN ADULTS DURING THE COVID-19 PANDEMIC

Author: *Sandra Feldmane*<sup>1</sup>

Scientific research supervisor: Dr. psych. *Jeļena Ļubenko*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Illness perception, Illness representations, COVID19, Impact, Mental health, Pandemic.

**Objectives.** The end of 2019 and early 2020 shocked the world with a new infectious disease called COVID-19 which caused a global health crisis. People were called to follow a number of health behaviour measures. The illness perception is one of the key factors for understanding and respecting the adoption of preventive action.

**Materials and Methods.** The study included 9565 participants from 78 countries (77,7% female, 22,0% male, 0,03% other),  $M = 36,9$ ,  $SD = 13,88$ . Participants filled Adapted Illness Perception Questionnaire for COVID – IPQ (Broadbent et al., 2006, 2015; Karekla, Gloster, Kassianos, 2019) and Beliefs about COVID based on the HBM (Irwin, 1966; Rosenstock, 1966; Becker et al., 1970; Karekla, Gloster, Kassianos, 2019). Data were collected from March 2020 to June 2020 by completing an international online survey as part of the COVID-19 IMPACT study.

**Results.** Statistically significant negative correlations were found between age and Covid-19 illness perception in the dimensions: Consequences, Treatment Control and Emotional Response ( $r = -0.05$  to  $-0.07$ ,  $p < 0.01$ ). The analysis of gender differences revealed that women showed significantly higher results in all dimensions and scales of illness perception, except Personal control. Healthcare workers in comparison to other respondents showed lower average scores on COVID-19 illness perception ratings on Consequences, Concern, Emotional Response, and Perceived Severity of COVID-19, but higher scores on Perceived Susceptibility to COVID-19. There were statistically significant differences in almost all dimensions of illness perception between groups based on the risk factors (being aged above 60; having cancer) as determined by one-way ANOVA.

**Conclusions.** The results show the importance of gender, age, occupation and belonging to the risk group (age 60 + and oncology) in the illness perception of COVID-19 in sample of adults.

## EMOTIONAL HELPLINES: HOW MUCH DO THE PSYCHIATRISTS AND RESIDENT DOCTORS IN PSYCHIATRY KNOW ABOUT THEM?

Authors: *Augusta Valentukevičiūtė*<sup>1</sup>, *Kotryna Liberytė*<sup>1</sup>  
Scientific research supervisor: Asoc. Prof. *Alvydas Navickas*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Psychiatrists, resident doctors in psychiatry, emotional support, emotional support helplines, recommendations.

**Objectives.** Assess the knowledge of doctors working in the field of psychiatry (psychiatrists, resident doctors in psychiatry) about emotional support lines, their types, contacts. Determine how often do survey participants recommend patients to seek support using emotional helplines.

**Materials and Methods.** 35 doctors (psychiatrists and resident doctors in psychiatry) were interviewed. The questions in the questionnaire included respondent's professional specialization, demographic data (age, gender), types of known emotional support lines, their contacts, subjective evaluation of frequency recommendations to contact the emotional support helpline.

**Results.** Among the surveyed doctors the „Youth line“ was the most-known line of emotional support. „Children's Line“ (14 (40%)), „Silver Line“ (12 (34%)), „Helpline for Women“ (11 (31%)) were mentioned less frequently. The majority of the interviewed physicians indicated that they generally recommend patients to seek help in emotional support helplines. When asked about the frequency of recommendations, 1 (3%) indicated that they never recommend contacting the emotional support line, 17 (49%) recommend rarely, 14 (40%) – moderately, 3 (9%) – common, and 0 (0%) – very common. According to the interviewed doctors, patients with neurotic, stress-related and somatoform disorders (F40-F49), mood disorders (F30-F39) and organic and symptomatic mental disorders (F00-F09) were the most likely to contact emotional support helplines.

**Conclusions.** The majority of doctors recommend their patients to reach help using emotional helplines, but only 3 out of 35 were able to write at least one telephone number of the emotional helpline.

## DISCRIMINATION BASED ON SEXUAL ORIENTATION: PREVALENCE AND LINKS WITH PSYCHOSOCIAL DISTRESS AMONG STUDENTS OF VILNIUS UNIVERSITY

Authors: *Augusta Valentukevičiūtė*<sup>1</sup>, *Aivija Pečkutė*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Aušra Šapranauskienė*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Discrimination, CORE-OM, psychological distress, homophobia, biphobia, students, LGBT, Vilnius University.

**Objectives.** 1) to examine the noticed and experienced cases of discrimination based on sexual orientation among homosexual, bisexual and heterosexual Vilnius University students; 2) to compare our results with EU and Lithuanian survey data; 3) to investigate discrimination cases in the Vilnius University environment and its possible impact on psychological distress.

**Materials and Methods.** A questionnaire survey was conducted to students of Vilnius University with help from the University LGBT+ group, Lithuanian Gay League, and internet website Gayline.lt. The questionnaire includes a CORE-OM test to assess psychological distress and several questions about sexual orientation, perceived and experienced discrimination on the grounds of sexual orientation in society, its frequency, and nature, questions about sexual minority respondents' discrimination based on sexual orientation in the environment of Vilnius University, its sources, and frequency. 331 valid forms were included, distinguishing 2 control groups (heterosexual men (N=40) and women (N=153)) and 4 research groups (homosexual men (N=41) and women (N=23), bisexual men (N=18) and women (N=56)). Statistical analysis was performed with R 3.3.2 program Commander and IBM SPSS 21.0 program.

**Results.** Among all study groups, homosexual (55%) and bisexual (39%) men claimed to experience discrimination on the grounds of sexual orientation over a 12-month period the most often. Bisexual women (21%) claimed to be discriminated against on the grounds of sexual orientation at the least. Respondents from all research groups (sexual minorities) who claim to experience discrimination in the VU environment has been evaluated with greater psychological distress (higher overall and functional CORE-OM scores) than those who do not.

**Conclusions.** Homosexual and bisexual men were the most likely to experience discrimination. Sexual minorities who experience discrimination in the VU environment are associated with higher psychological distress levels.

## MYSTICAL EXPERIENCE PREDICTS SPIRITUAL INTELLIGENCE

Author: *Daiga Katrīna Bitēna*<sup>1</sup>

Scientific research supervisor: Prof. *Kristīne Mārtinsone*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Faculty of Public Health and Social Welfare, Department of Health Psychology and Pedagogy, Latvia*

**Keywords.** Mystical experience, spiritual intelligence.

**Objectives.** Mystical experience (ME) is an altered state of consciousness and may indicate an individual's psychospiritual growth (Garcia-Romeu et al., 2015). Since one of the defining characteristics of ME is a sense of the presence of a higher, all-encompassing force, ME is often interpreted as a spiritual experience (Lifshitz et al., 2019; Moreira-Almeida, 2012). One of the concepts of spirituality whose relationship with ME has so far not been studied, is spiritual intelligence. The ability to enter and exit higher states of consciousness is mentioned as one of the characteristics of spiritual intelligence (King & DeCicco, 2009).

The aim of this research was to evaluate the relationships between ME spiritual intelligence on a sample of 299 non-clinical Latvian women. We hypothesized that spiritual intelligence will be closely related to ME and ME will be an important predictor of spiritual intelligence.

**Materials and Methods.** The data were collected using three self-report questionnaires – Mysticism Scale (Hood, 2001), Spiritual Intelligence Survey (Bitēna et al., 2020), and sociodemographic data survey.

**Results.** Results suggest that ME is positively correlated with the overall indicator of Spiritual intelligence ( $r_s = .66, p < .001$ ) as well as its factors ( $r_s = .46-.63, p < .001$ ) and is important predictor to the spiritual intelligence ( $\beta = .66$ ).

**Conclusions.** The results of the study support the growing trend of the recent years to view ME as a spiritual phenomenon (Harris et al., 2015; Moreira-Almeida & Cardeña, 2011), which is often perceived and interpreted as a spiritual experience (Garcia-Romeu et al., 2015) and is consistent with previous research on the relationship between ME and spiritual dimensions (Willard & Norenzayan, 2017).

## SLEEP & MIND: THE RELATIONSHIP BETWEEN SLEEP HYGIENE AND DAYTIME SLEEPINESS AND COGNITIVE PROCESSES IN LATVIAN ADOLESCENTS

Author: *Renārs Alksnītis*<sup>1</sup>

Scientific research supervisor: *Edmunds Vanags*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *University of Latvia, Latvia*

**Keywords.** Sleep, sleep hygiene, cognitive abilities, adolescents.

**Objectives.** To determine and analyze the self-reported indices of sleep hygiene, cognitive test indices and daytime sleepiness, and to find whether there are any correlations within these factors. To determine whether there are any differences in the beforementioned factors between genders. To educate Latvian youth on the importance of sleep and sleep hygiene (in “research-friendly” secondary schools).

**Materials and Methods.** Sleep hygiene was assessed by *Adolescent Sleep Hygiene Scale* (Storfer-Isser, Lebourgeois, Harsh, Tompsett, & Redline, 2013), daytime sleepiness was assessed by the *Pediatric Daytime Sleepiness Scale* (Drake et al., 2003); *The Digit Span test* (adapted by Vanags, Ekmanis, 2018) was used to test the short term memory. *The Stroop test* (Roelofs, 2010; Stroop, 1935; modification by Vanags & Ekmanis, 2018). *The Wisconsin Card Sorting test* was used to assess the decision making ability.

**Results.** Sleep hygiene scores form a statistically significant negative association with daytime sleepiness scores ( $r_s = -.423$ ,  $p < .001$ ). The bedtime factor on the Adolescent Sleep Hygiene Scale produces a statistically significant negative association with impulsivity scores ( $r_s = -.155$ ,  $p = .048$ ). Better sleep hygiene scores are associated with better short-term memory scores ( $r_s = .158$ ,  $p = .043$ ,  $r_s = .190$ ,  $p = .015$ ).

**Conclusions.** Adolescent Sleep Hygiene is negatively associated with Pediatric Daytime Drowsiness. Sleep and sleep hygiene are associated with memory, especially short-term memory, that is, if an individual pursues healthy sleeping habits shows better results in a short-term memory test. Hypotheses: “Higher self-reported sleep hygiene rates among young people are confirmed to be negatively associated with daytime sleepiness rates” and “there are gender differences in sleep hygiene and daytime sleepiness rates among young people”. The hypothesis “higher self-reported sleep hygiene rates among young people are positively related to cognitive test scores” was partially confirmed.

## DEVELOPMENT OF THE FIRST STAGE OF EMOTIONAL STROOP TASK: EMOTIONAL RESPONSE TIME TO COVID-19 SEMANTICALLY RELATED WORDS

Author: *Rebeka Nagle*<sup>1</sup>

Scientific research supervisor: Mg. Psych. *Kristīne Šneidere*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Semantically related words, COVID-19, emotional words, neutral words.

**Objectives.** As COVID-19 infection is relatively unexplored and new, public awareness of it varies greatly. Increased mortality rate generates uncertainty, fear, anxiety, and despair. In view of the rapidly changing circumstances and the current situation in the world, it would be valuable to ascertain whether the notion of COVID-19 itself is related to the individuals' cognitive processes, specifically – response time. Thus, the aim of the study was to create word norms associated with COVID-19, as the first step of developing a tool for evaluating the reaction time to emotionally saturated words.

**Materials and Methods.** Data were collected from 171 respondents, of whom 143 were women and 28 men, aged 14–56 years ( $M = 23$ , 16,4% male). To obtain emotional words respondents had to fill in a questionnaire and indicate: gender, age, whether the respondent had or had not COVID-19, and the five words that the respondent most associated with COVID-19 infection. A questionnaire was posted for public access on Facebook. Neutral words were chosen from available Stroop tasks in scientific databases.

**Results.** Frequencies for the words were calculated and 10 most often mentioned words were chosen. The word “masks” was mentioned most often, 92 times (53,8%), the second most frequently mentioned word was “isolation”, 43 times (25,15%), the third “quarantine”, 37 times (21,64%), fourth was “restrictions”, 29 times (16,96%), fifth was “cough”, 29 times (16,96%), sixth was “pandemic”, 28 times (16,37%), seventh was “virus”, 25 times (14,62%), eighth was “fear”, 21 times (12,28%), ninth was “uninformed”, 21 times (12,28%), tenth was “distancing”, 19 times (19,11%). Of the available neutral words, the 10 most common were selected: chair, table, box, street, wood, pen, key, umbrella, fork, and shop.

**Conclusions.** From the data collected, it can be concluded that humans have similar word associations with covid-19. Associations are closely linked to the most visible and common everyday life processes during a pandemic.

## DIFFERENCE IN OPINION ON COVID19 PANDEMICS IMPACT ON MUTUAL SOCIAL RELATIONS FOR RĪGA STRADIŅŠ UNIVERSITY STUDENTS

Authors: *Anna Jete Gauja*<sup>1</sup>, *Mārtiņš Danefelds*<sup>1</sup>, *Krišjānis Dzirnieks*<sup>1</sup>

Scientific research supervisor: Mg. Psych. *Ilze Ābelniece*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *National Centre for Education, State pedagogical Medical Commission, Latvia*

**Keywords.** Views on the pandemic social relations, relationship dissolution, COVID19.

**Objectives.** The COVID19 pandemic has not only caused an extensive population's morbidity and mortality, but also has uncovered society's differences in attitudes and opinions about COVID19, health risks, restrictions, immunization and science in general. Tensions have risen on social media, with many expressing their contradicting opinions, arguing or unfriending peers due to disagreements. The objective of the study was to examine how differences in opinions have influenced relationships among Rīga Stradiņš university (RSU) students, their social contacts outside the university, and families.

**Materials and Methods.** Online questionnaire with 17 questions about people's thoughts on the pandemic and changes in communication with different groups was spread via social media and RSU communication platforms targeting RSU students. 196 students of RSU aged 18 and up (m=18-21) took part in this study. Further data analysis with SPSS 26.0.

**Results.** From the respondents, 87.8% (n=172) students see COVID19 as a serious threat and 0.5% (n=1) disagree with this statement. Respondent's answers showed that 87.8% (n=172) have met someone with differing opinions on COVID19. The relationship change differed between groups - from 9.2 % (n=18) with study peers to 28.6% (n=56) with acquaintances. The main reason for this change was the spreading of fake news 40.8% (n=80) and expressed disbelief in COVID19 40.3% (n=79). 16.8% (n=33) ended their friendship on social media with acquaintances over disagreements.

**Conclusions.** Results of the study show that the relationships of RSU students have been moderately affected. Minor changes were detected between study peers, however for 3 out of 10 RSU students there were change in relationships with acquaintances. To understand this topic thoroughly, the study should be continued on a larger population.



## CONSTRUCTION AND VALIDATION OF THE INSTRUMENT OF COGNITIVE DIMENSIONS OF SOCIAL CAPITAL

Author: *Inta Ozerska*<sup>1</sup>

Scientific research supervisors: Prof. *Kristīne Mārtinsonē*<sup>1</sup>, Mg.paed. *Sanita Šuriņa*<sup>1</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Cognitive dimensions, social capital, validity.

**Objectives.** The concepts of social capital for construction instrument of cognitive dimensions based on the theoretical concept (Šuriņa, Mārtinsonē, 2020) developed on the research of the Rapid Review cover the types of bonding, bridging and linking social capital and cognitive and structural dimensions.

The objective is to develop instrument of cognitive dimensions of social capital and test validity of psychometric indicators.

**Materials and Methods.** The data originate from a national representative cross-sectional online survey "Life with COVID-19: Assessment of overcoming the crisis caused by coronavirus in Latvia and proposals for the sustainability of society in the future" in September 2020, in cooperation with the research centre SKDS.

For this study the instrument validity, the internal consistency of the scales, as well as the response and discrimination indexes were examined.

**Results.** As a result, 8 factors structure of cognitive dimensions of social capital was confirmed ( $k = 38$ ). In general, it can be concluded that the survey examines a unified phenomenon, and the items are internally consistent on all scales ( $\alpha = .697-.932$ ). Although the response index is assessed as remarkably high for  $F_1$  ( $k=9$ ) items ( $M > 4.84$ ), they are included in the survey based on the item and the sample interlinkage specifics. Discrimination indexes generally meet the scientific requirements falling within the range (.2 – .8).

Cognitive dimension of social capital consist of the following elements: bonding (shared values, perceived social support and trust for family members and close friends), bridging (perceived social support, sense of belonging and trust for known people, general trust) and linking (institutional trust, national identity).

**Conclusions.** The present findings of study indicate the validity of the social capital cognitive dimensions questionnaire. The total scale demonstrated very good internal consistency.

## REASONS NOT TO REACH HELP FROM EMOTIONAL HELPLINES AMONG PATIENTS HOSPITALISED IN MENTAL HEALTHCARE INSTITUTIONS

Authors: *Augusta Valentukevičiūtė*<sup>1</sup>, *Kotryna Liberytė*<sup>1</sup>  
Scientific research supervisor: Asoc. Prof. *Alvydas Navickas*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Emotional support, emotional support helpline, emotional support possibilities, mental health, crisis, hospitalised, patients, psychiatry.

**Objectives.** To investigate whether patients treated in mental health care facilities have heard about the possibility of contacting emotional support lines and whether they know the principles of the lines. Evaluate the reasons for not applying to the emotional support lines and examine the opinion of the applicants about the quality of this type of support.

**Materials and Methods.** An anonymous questionnaire survey was conducted. The survey included 45 patients: 26 were treated in VmPSC (Vilnius City Mental Health Centre) I acute, 11 in the borderline conditions ward, and 8 in the RPLC (Republican Centre for Addictive Disorders) motivational therapy and rehabilitation ward. The questionnaire consisted of questions covering demographic data, questions about suicide, crises experienced, knowledge about the activities of emotional support lines, reasons for not contacting emotional support lines, and assessment of the quality of helpline services.

**Results.** 24 (53%) men and 21 (47%) women were interviewed, with a mean age of  $43 \pm 16.29$ . 36 (80%) patients reported having heard of emotional helplines, but only 5 (14%) patients have applied. 38 (84%) patients said they knew which phone number to call an ambulance for. The "Youth Line" is an emotional helpline that most of the interviewed patients know about - 17 (38%). Loss of relatives and divorce, the most common crises experienced by the interviewed patients, were reported by 16 (36%) and 13 (29%) patients, respectively. 21 (47%) patients indicated that they consult a specialist (psychologist, psychotherapist, psychiatrist) in the event of a crisis, 13 (29%) - with a family, 3 (7%) patients indicated that they turn to emotional helplines. The majority of patients indicated that they did not turn to emotional helplines because they did not remember the possibility of such help.

**Conclusions.** 80% of patients have heard of emotional helplines, but only 14% of them have sought such help.

## RELATIONSHIP BETWEEN GENDER IDENTITY AND PSYCHOLOGICAL DISTRESS AMONG HOMOSEXUAL, BISEXUAL AND HETEROSEXUAL STUDENTS OF VILNIUS UNIVERSITY

Authors: *Augusta Valentukevičiūtė*<sup>1</sup>, *Aivija Pečkutė*<sup>1</sup>

Scientific research supervisor: Dr. *Aušra Šapranauskienė*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Gender identity, psychological distress, CORE-OM, sexual orientation, Vilnius university, students.

**Objectives.** The aim of the study was to examine how homosexual, bisexual and heterosexual students of Vilnius University evaluate their gender identity and identify a possible link between gender identity and psychological distress.

**Materials and Methods.** An online anonymous questionnaire survey was conducted to students of Vilnius University with a help from University LGBT+ group, Lithuanian Gay League and internet website Gayline.lt. The questionnaire includes CORE-OM test to assess psychological distress and several questions based on how “feminine” or “masculine” (according to socially constructed gender norms) the study participant thinks to be on a scale from 1 to 10 (1 – “very masculine”, 10 – “very feminine”). 331 valid forms were included. The study groups consisted of 2 control groups (heterosexual men (N=40) and women (N=153) and 4 experimental groups (homosexual men (N=41) and women (N=23), bisexual men (N=18) and women (N=56). Statistical analysis was performed using the R 3.3.2 Commander package and IBM SPSS 21.0 program.

**Results.** Bisexual women consider themselves significantly more “masculine” than heterosexual women. Heterosexual men consider themselves significantly more “masculine” compared to heterosexual women. Bisexual men consider themselves more „masculine“ than heterosexual women. Homosexual men and homosexual women rate their “masculinity”/“femininity” without statistically significant differences. It has been observed that the linkage between psychological distress and “femininity” show a negative correlation – the more a heterosexual and bisexual woman considers herself to be “feminine“, the less psychological distress she experiences.

**Conclusions.** Significant differences in gender identity estimates were observed among study and experimental groups. A possible link was identified – a negative correlation between psychological distress and „femininity“ in heterosexual and bisexual women was identified.

# CASE REPORTS, SMALL CASE SERIES

## INTERNAL MEDICINE

### FEVER OF UNKNOWN ORIGIN: UNUSUAL CASE IN NEPHROLOGY

Author: *Ēriks Vidžups*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Viktorija Kuzema*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Fever, cough, purpuric rash, aortic arch prosthesis, acute pancreatitis.

**Introduction.** Fever of unknown origin is body temperature  $\geq 38.3^{\circ}\text{C}$  that does not result from disorders with clear-cut localising symptoms or signs on common tests.

**Case Description.** A 56-year-old woman presented with episodes of fever up to  $40.0^{\circ}\text{C}$  for 5 years, nausea, dry cough, rash on legs, weight loss. She had prosthetic replacement of the aortic arch in 1991 due to coarctation. She was sent to Pauls Stradiņš Clinical University Hospital Department of Nephrology with a diagnosis of vasculitis suspecta. During examination patient presented with nephritic syndrome, kidney failure (GFR=31.7 ml/min), elevated anti-dsDNA, cANCA, hypocomplementaemia, anaemia. Rapidly progressive glomerulonephritis, cANCA vasculitis affecting kidneys, lungs and skin, SLE were suspected. Thoracic CT showed no sign of vasculitic lesions. Kidney biopsy showed secondary membranoproliferative glomerulonephritis with FSGS. Blood, urine cultures repeatedly negative. Empirical vasculitis treatment developed acute stomach pain, amylase and lipase levels were 2650 U/L and 8300 U/L, abdominal CT showed signs of acute pancreatitis. Detailed anamnesis were recollected, patient had worked with cattle years ago, which led to differential diagnosis: Q fever. IgM, IgG for *Coxiella burnetii* were positive. TEEcho showed cavity next to aortic root 0.7x0.9cm, cardiac CT revealed vegetations on aortic prosthesis. Specific therapy for chronic Q fever was started. Treatment is prolonged, typically for at least 18 months. Patient's complains reduced gradually. She was discharged for further treatment, observation.

**Summary.** Chronic Q fever occurs in <5% of patients and manifests as endocarditis or hepatitis. The patient had risk factor: prosthesis of aortic arch. Domestic animals are the reservoirs for human Q fever infection, which occurs worldwide.

**Conclusion.** This case report shows diagnostic challenges of a patient with fever of unknown origin. A correct diagnosis is an expectation in a good outcome of treatment, hence even past history can set doctors on the right path.

## FAMILY HEREDITARY ANGIOEDEMA. CLINICAL CASE

Authors: *Evelīna Možeitoviča*<sup>1</sup>, *Kristīna Getca*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. Dr. med. *Natalja Kurjāne*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Hereditary angioedema, C<sub>1</sub>-INH, C<sub>1</sub>-INH function, C<sub>4</sub> component.

**Introduction.** Hereditary angioedema (HAE) is a rare inborn error of immunity that affects approximately 1 in 50,000 individuals. Mostly it is caused by deficiency or dysfunction of C<sub>1</sub> inhibitor (C<sub>1</sub>-INH). HAE has three types: I and II are associated with C<sub>1</sub>-INH deficiency or function, and type III is not associated with C<sub>1</sub>-INH deficiency. All three types of HAE are bradykinin-associated not histamine-associated.

**Case Description.** A 60-year-old white woman's history revealed that she had her first episode of angioedema at the age of 43. She experienced progressive swelling of the lip, cheeks and eyes during 3-5 days. There was no response to antihistamines or corticosteroids. Also, the patient had experienced two laryngeal oedema attacks that provoked shortness of breath and loss of speech. Allergic tests were negative, but C<sub>4</sub> complement component level, C<sub>1</sub>-INH Ag and its functional concentration were decreased. Delayed diagnosis HAE was performed in 2 years after first symptoms.

**Summary.** A 60-year-old woman experienced her first angioedema attack in 2003 when she was 43, after accidentally biting her upper lip, which resulted in generalized facial oedema. Allergic tests were negative. The patient's analyses revealed that both C<sub>1</sub>-INH Ag and C<sub>4</sub> levels were low. She was subsequently diagnosed with HAE. The patient was prescribed intravenous C<sub>1</sub>-INH replacement therapy that helps to diminish the symptoms. The patient's daughter was also diagnosed with HAE. She was experiencing similar symptoms after her first menstruation.

**Conclusion.** HAE is a rare condition characterized by recurrent, acute episodes of unexplained oedema without typical urticaria. Bradykinin-mediated angioedema is not responsive to antihistamines or corticosteroids. Timely diagnosed HAE is very important to be able to distinguish that type of angioedema for specific treatment because the swelling can be frequently life-threatening.

## GRADUAL VISION LOSS IN A PATIENT DIAGNOSED WITH LEBER HEREDITARY OPTIC NEUROPATHY DUE MT-ND6 POINT MUTATION (m.14484T>C)

Author: *Liveta Sereikaite*<sup>1</sup>

Scientific research supervisors: Prof. *Rasa Liutkeviciene*<sup>2,3</sup>,  
Dr. *Brigita Glebauskiene*<sup>2</sup>, Prof. *Reda Zemaitiene*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Department of Ophthalmology, Lithuanian University of Health Sciences, Lithuania*

<sup>3</sup> *Neuroscience Institute, Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Leber hereditary optic neuropathy, mitochondrial disorder, point mutation.

**Introduction.** We present a case report of a 49-year-old man diagnosed with Leber hereditary optic neuropathy (LHON) harbouring m.14484T>C mutation in the MT-ND6 gene, who experienced gradual vision loss.

**Case Description.** A 49-year-old male patient experienced gradual painless vision loss in both eyes. From the medical history, we found that the onset of symptoms was about one year before the diagnosis was confirmed. During the first visit, best corrected visual acuity (Snellen chart, Landolt C optotype) in the right eye was 0.2, in the left eye 0.2. After 1 month best corrected visual acuity in both eyes was reduced to 0.05. Both eyes showed central scotomas on full field visual testing. On slit-lamp examination, the findings of the anterior pole were within normal limits. Color vision and intraocular pressure were normal during both examinations. Dilated fundus examination showed optic nerve disk (OND) in pink color, the borders of OND were clear and well defined, elevated in the inferior parts, resembling drusen, narrow blood vessels. Optic coherence tomography (OCT) of retinal nerve fiber layer revealed temporal quadrants atrophic signs in both eyes. OCT of the macula was normal. Magnetic resonance brain imaging showed no signs of neuroinflammatory process or compressive lesions. As LHON was suspected, whole mitochondrial genome sequencing was initiated.

**Summary.** LHON is a mitochondrial disorder characterized by gradual, painless, severe visual loss in one eye, followed weeks to years later by the same process in the other eye that usually affects young adults with a higher prevalence in men. Three primary mtDNA point mutations comprise over 90% of cases: 11778(69%), 3460(13%), and 14484(14%).

**Conclusion.** Results of the performed mtDNA analysis confirmed the diagnosis of LHON. Patient was identified to carry homoplasmic pathogenic variant m.14484T>C in MT-ND6 gene. The patient's offspring risk for inheriting variant m.14484T>C is very low.

## WHEN PSYCHIATRY MEETS NEUROLOGY: CLINICAL CASES OF AUTOIMMUNE ENCEPHALITIS

Author: *Jorinta Kazlauskaitė*<sup>1</sup>

Scientific research supervisor: Assist. Prof. Dr. *Nataša Giedraitienė*<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Autoimmune, encephalitis, NMDAR, CASPR2.

**Introduction.** Autoimmune encephalitis (AE) is one of the most growing field of neurology. It is reported that the incidence of AE might be comparable to that of infectious encephalitis. As AE is potentially treatable, further discussion and accumulation of experience is needed in treating this specific patient group.

**Case Description.** We present two clinical cases of AE treated in Vilnius University Hospital Santaros Klinikos. The first patient was diagnosed with anti-NMDA receptor encephalitis, the second – with anti-CASRP<sub>2</sub> receptor encephalitis. Due to insidious course of the disease both patients were first admitted to psychiatric hospital. Psychiatrists suspected the possibility of AE and consulted neurologists. Time to diagnosis of AE was 1 and 4 months accordingly. Both patients were refractory to first-line immunotherapy, one patient was recognized a fit candidate for rituximab therapy. The treatment outcomes in both patients were poor, as no significant cognitive and clinical symptom improvement after treatment were reached.

**Summary.** AE is commonly overlooked diagnosis as it presents with a variety of clinical features comprising behavioral, cognitive, and somatic changes. Standard neuroimaging and laboratory tests may not be specific or sensitive enough for AE, therefore testing for specific antibodies in both cerebrospinal fluid and blood should be done. Poor prognosis of late-diagnosed AE patients leads to further discussion of possible improvements in our diagnostic processes. AE is true diagnostic challenge for all practitioners; therefore, we believe that the cases presented may contribute to better understanding and raise of awareness about AE.

**Conclusion.** Although AE is a rare, both neurologists and psychiatrists should be able to suspect and diagnose it. The cases presented illustrate how insidious AE presentation can lead to delayed diagnosis and adverse patient prognosis. Therefore, early suspicion, thorough patient examination, early and aggressive treatment of AE is a standard of patient care.

## AN UNUSUAL PRESENTATION OF GASTRIC CANCER AND CHRONIC LYMPHOCYTIC LEUKAEMIA IN A PATIENT: A CASE REPORT

Authors: **Maria Mirabela Fratila**<sup>1</sup>, **Diana-Maria Rusu**<sup>1</sup>

Scientific research supervisor: Dr. med. **Cristina Rezi**<sup>1,2</sup>

<sup>1</sup> *Lucian Blaga University of Sibiu, Romania*

<sup>2</sup> *Polisano European Clinic, Sibiu, Romania*

**Keywords.** Chronic lymphocytic leukaemia, gastric cancer.

**Introduction.** Chronic lymphocytic leukemia (CLL) represents a neoplasm of mostly CD5-positive, mature B-cells, but incompetent regarding their function. A patient with one neoplasm has a high risk of being diagnosed with a second one. Thus, CLL and gastric carcinoma may be present in the same patient involving some serious therapeutic challenges. Some of the risk factors have already been studied, while others remain unknown.

**Case Description.** We present the case of a 52-year old man without family history of cancer who presented at the Internal Medicine Department with abdominal pain in the left hypochondriac region, rapid weight loss, the presence of multiple, painless cervical and submandibular enlarged lymph nodes for several weeks.

The laboratory tests showed: leukocytes 66000/mm<sup>3</sup>, mature-appearing lymphocytes, smudge cells, suggesting chronic lymphoproliferative disorder. The findings of the gastroscopy included a tumor of the gastric body, seen on CT scan as well.

The patient was moved to Hematology where he started the specific treatment for CLL with favourable outcomes. Afterwards he received the histopathology report of the gastric tumor which showed weakly cohesive gastric cancer with signet ring cells. He started the neoadjuvant chemotherapy. After imagistic examinations he will be considered for surgical treatment of the gastric cancer.

**Summary.** A 52-year old patient presented at the Internal Medicine Department with abdominal pain in the left hypochondriac region, rapid weight loss, multiple, painless cervical and submandibular enlarged lymph nodes. Based on the laboratory tests, CT findings and gastroscopy he was diagnosed with chronic lymphocytic leukaemia. Afterwards he received the results of the histopathology report which showed gastric cancer with signet ring cells.

**Conclusion.** This case is particular because of the presence of the two neoplasms at the same patient, which could be a coincidence or the consequence of impaired immunity, with other risk factors: carcinogenic, hereditary, immunosuppressive, iatrogenic.



## ECHINOCOCCOSIS MIMICKING CHOLANGIOCARCINOMA: A CASE REPORT

Author: *Amanda Anna Bērziņa*<sup>1</sup>

Scientific research supervisor: Dr. *Poļina Zaļizko*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Echinococcosis, cholangiocarcinoma.

**Introduction.** Echinococcosis is a heterogenic group of zoonotic parasitic diseases most often caused by cestode *Echinococcus granulosus*. Humans are an accidental intermediate host and can become infected by eating parasitic eggs which end up in the hands of a human after picking berries or petting a dog or a cat. The incidence of echinococcosis in European countries ranges from 0.1 to 10 cases per 100,000 population. Recently, 6-10 new cases of echinococcosis have been registered in Latvia every year.

**Case Description.** A 74 year-old female with jaundice was examined in regional hospital in July 2020 with suspicion of gallstones. Patient complains were – dark urine, light stools, general weakness, intermittent shortness of breath and prolonged dizziness. In consequent abdominal computed tomography (CT), changes in the left lobe of the liver with secondary cholestasis were found and diagnosis – cholangiocarcinoma - was established. Due to growing jaundice, the patient was transferred to a hospital in the capital city for a biliary drainage procedure.

During additional examination, patient was presented in Oncology Council – it was decided to investigate Echinococcosis as a differential diagnosis. After performing abdominal MRI, diagnosis of Echinococcosis was highly probable. Controlling the spread of possible echinococcosis, CT scan of the lungs and head was performed – no pathology was found. In August 2020, hospital received a positive test, where specific IgG antibodies against *Echinococcus* species were detected in the blood. Prescribed therapy was with T. Albendazole 400mg every 12 hours.

**Summary.** Echinococcosis is a rare but potentially fatal parasitic infection that affects the liver, as well as it can metastasize to the lungs, brain, and other organs. Echinococcosis is a serious disease – the patient must take the medicine often throughout ones life.

**Conclusion.** Echinococcosis may be difficult to diagnose and treat due to misinterpretation of a cancer.

## AUTOIMMUNE SERONEGATIVE LIMBIC ENCEPHALITIS WITH REFRACTORY STATUS EPILEPTICUS: A CASE REPORT

Author: *Sabīne Teifurova*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Daina Pastare*<sup>2</sup>,  
Dr. *Elina Polusonika*<sup>2</sup>, Prof. *Guntis Karelis*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Department of Neurology, Latvia*

**Keywords.** Autoimmune limbic encephalitis, status epilepticus.

**Introduction.** Autoimmune limbic encephalitis is a rare condition characterized by cognitive and behavioral decline, as well as seizures that are resistant to anticonvulsant therapy. Early recognition is significant for fast, often complete recovery due to a good response to plasma exchange, intravenous immunoglobulin and steroid therapy. Delayed diagnosis can lead to long-term neurological consequences.

**Case Description.** A 30-year-old female admitted to the intensive care unit of Rīga East Clinical University hospital due to a refractory status epilepticus and suspected autoimmune encephalitis. Previous history was unremarkable. In the hospital the patient had focal to bilateral tonic-clonic seizures which were resistant to anticonvulsant therapy. Patient's condition was severe, GCS 3, mechanical ventilation was provided. MRI showed contrast enhancing hyperintense changes in the right temporal lobe uncus, hippocampus, trigonum region. Antibodies for NMDA receptors, AMPA<sub>1</sub>, AMPA<sub>2</sub>, LK11, CASPR2, GABA-B, neuronal antibodies in CSF were negative. Cerebrospinal fluid analysis showed 6 cells/mm<sup>3</sup>, other values within the reference range. Blood biochemical analysis showed elevated inflammatory factors. EEG showed pronounced damage of frontocentral and right temporal lobe. Ovarian teratoma and other tumors were excluded. Plasma exchange, high dose methylprednisolone and anticonvulsant therapy were initiated after which the patient's condition improved. Additionally, human immunoglobulin and mycophenolate in combination with corticosteroids was given due to recurrent seizures. The frequency of seizures significantly reduced. Patient was discharged after 2 months of hospitalization with the diagnosis of autoimmune seronegative limbic encephalitis which was confirmed based on clinical and MRI findings. On a follow-up 3 months later patient's condition had greatly improved, however moderate cognitive decline, poor memory, impaired concentration remained and 2 generalized seizures occurred since the hospitalization period despite the therapy. Patient was discharged with immunosuppressive and immense anticonvulsant therapy.

**Summary.** This case shows an example of refractory status epilepticus due to an autoimmune seronegative limbic encephalitis. Diagnosis was confirmed based on clinical manifestation and MRI findings.

**Conclusion.** Autoimmune limbic encephalitis should be considered in all patients with refractory status epilepticus. Early diagnosis and treatment are significant for a fast recovery.

## INFLAMMATORY PSEUDOTUMOR OF THE PANCREAS MIMICKING A PANCREATIC NEOPLASM: A CLINICAL CASE

Authors: *Laura Dobrovaitė*<sup>1</sup>, *Paulina Tekoriūtė*<sup>1</sup>, *Evelina Gudaviciute*<sup>1</sup>

Scientific research supervisor: Dr. *Rasita Pavilionienė*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Republic Klaipeda Hospital, Lithuania*

**Keywords.** Inflammatory pseudotumor, pancreatic cancer, mimicry.

**Introduction.** There are a number of conditions of non-neoplastic origin that can lead to the formation of pancreatic structures that mimic pancreatic cancer. One of them is an inflammatory pseudotumor. It is difficult to differentiate this pathology using clinical and radiological examinations alone - histological examination is necessary. We present a clinical case of an inflammatory pseudotumor mimicking pancreatic cancer.

**Case Description.** A 64-year-old patient was admitted to the hospital with clinical symptoms such as jaundice, pain in the upper abdomen and nausea. An abdominal ultrasound examination showed a tumoral lesion highly suspicious of pancreatic neoplasia located in the head of the pancreas. For better characterization, the computer tomography (CT) was performed, showing an infiltrate in the paraduodenal space between the head of the pancreas and duodenum. These findings were mostly compatible with a pseudotumoral pancreatitis with biliary obstruction. The patient was admitted to laparotomy for a further investigation. The histological analysis of the biopsy confirmed the diagnosis of chronic fibrous pancreatitis. A year after the surgery, the patient was evaluated on a gastroenterology consultation, and a postoperative CT was scheduled. The CT showed a positive dynamics as the pancreatic lesion had disappeared and the paraduodenal space had no new pathological or inflammatory lesions.

**Summary.** In this clinical case we present a patient with a suspected cancer of the head of the pancreas. For specifying the diagnosis the CT was done, showing a pseudotumoral pancreatitis with obstruction signs. The histological analysis of the biopsy verified an unexpected diagnosis of the chronic fibrous pancreatitis.

**Conclusion.** The cancer of pancreas is one of the most fatal malignancies. There are a number of non-neoplastic conditions mimicking this malignancy and one of them is an inflammatory pseudotumor. The final diagnosis of pseudotumor relies on the association of the radiological and histological evaluation.

## CHALLENGES OF ANTICOAGULANT DRUG THERAPY AFTER PULMONARY EMBOLISM IN CANCER PATIENTS

Author: *Medeina Kapacinskaite*<sup>1</sup>

Scientific research supervisor: Dr. med. *Greta Burneikaite*<sup>1,2</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Center of Cardiology and Angiology, Vilnius, Lithuania*

**Keywords.** Pulmonary embolism, chemotherapy, cancer, anticoagulants, thrombosis, low molecular weight heparin.

**Introduction.** Venous thromboembolism (VTE), composed of deep vein thrombosis (DVT) and pulmonary embolism (PE), is one of the leading causes of deaths in patients suffering from malignant tumors. Malignant cells produce and secrete procoagulant and fibrinolytic proteins as well as pro-inflammatory cytokines and, thus, induce cancer-associated hypercoagulability. The risk of thrombosis is further increased by actively receiving chemotherapy. The objective of this case report is to present possible strategies of PE treatment of an oncologic patient after chemotherapy.

**Case Description.** A 75-year-old man was admitted to the hospital with gradually worsening dyspnea over a 2-week period, fatigue and exercise intolerance. The patient, diagnosed with stage IV intrahepatic cholangiocarcinoma one year prior, underwent chemotherapy with gemcitabine and cisplatin. Significantly increased level of D-dimer as well as pathological echocardiography findings showed strong indication of PE, confirmed by characteristic CT scan view. Anticoagulant treatment was started immediately with low molecular weight heparin (LMWH) and was later replaced with oral anticoagulant for outpatient treatment. On subsequent visit after 6 months the patient showed improvement and repeated CT scan detected no signs of recurrence.

**Summary.** Direct oral anticoagulants can be selected as an effective option for further outpatient treatment of pulmonary embolism in cancer patients.

**Conclusion.** Due to cancer-related coagulation abnormalities it is of a paramount importance to select an accurate long-term treatment of PE for oncologic patients. Direct oral anticoagulants is a relatively new alternative considered to be effective and safe in cancer related PE management. However, more research is needed to find the best strategy for treating PE in the setting of cancer.

## COVID-19 PATIENT WITH AN ACCIDENTALLY DIAGNOSED IDIOPATHIC PULMONARY FIBROSIS

Author: *Darija Logvinova*<sup>1</sup>

Scientific research supervisor: Dr. *Zaiga Kravale*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Idiopathic pulmonary fibrosis, usual interstitial pneumonia, interstitial lung disease.

**Introduction.** Idiopathic pulmonary fibrosis (IPF) is a rare disease defined as a specific form of chronic progressive fibrosing interstitial pneumonia of unknown cause, occurring primarily in older adults, and is limited to lungs. The prognosis of IPF is poor with a median survival of 2 to 5 years after diagnosis without treatment.

**Case Description.** A 68-years old man was referred to Pauls Stradiņš Clinical University hospital with complaints of fever, dry cough and shortness of breath on exertion. SARS-CoV-2 test was positive, CT findings showed bilateral infiltrative changes in lower lobes of lungs (Covid-19 pneumonia) upon the background of interstitial lung disease – usual interstitial pneumonia pattern. The patient had a history of progressive shortness of breath for the past 2 years and 15-pack-years of tobacco use. Objective examination: “velcro-type” crackles on chest auscultation basally, SpO<sub>2</sub> 95% on rest. The patient was screened for autoantibodies – systemic connective tissue disorders were excluded. Council of physicians was convened – based on clinical, laboratory and radiological data, the diagnosis of IPF was confirmed. The patient was prescribed antifibrotic therapy with Nintedanib.

**Summary.** This case demonstrates a patient with undiagnosed IPF despite a long history of dyspnea and “velcro-type” crackles on chest auscultation. The patient was diagnosed with IPF by accident due to Covid-19 pneumonia.

**Conclusion.** Due to non-specific symptoms, IPF usually is diagnosed late in the course of the disease. Patients do not enter the pneumonologist’s sight for a long period of time, thus significantly delaying the start of treatment and worsening the patient’s already poor prognosis. While anti-fibrotic treatments may not cure the disease, they can significantly slow down its progression and hence improve prognosis. This is a main reason why early diagnosis and initiation of antifibrotic treatment are extremely important in IPF patients.

## POSTERIOR REVERSIBLE ENCEPHALOPATHY IN PREGNANT WOMAN

Author: *Karīna Kučerenko*<sup>1</sup>

Scientific research supervisor: Dr. *Iveta Haritončenko*<sup>1</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Posterior reversible encephalopathy, pregnancy, sensory disturbances, hemianopsia.

**Introduction.** Posterior reversible encephalopathy syndrome (PRES) is characterized by a subacute neurological and radiological reversible picture. It appears due to a number of causes that contribute vasogenic cerebral edema. The most common clinical signs are headache, convulsions, nausea/vomiting, changes in vision, impaired consciousness and altered mental status that develop after exposure of provocative factor.

**Case Description.** A 32-year-old pregnant woman (II progressive pregnancy 17 + 4 weeks) was hospitalized in an emergency center with complaints of mild headache on the right side, blurred vision and loss of vision on the left side, sensory disturbances on the left side of the body. Daily use of medication was denied, family history was negative.

After consultation of a neurologist was detected, that the patient had a homonymous hemianopsia on the left side, a mild left hemisindrome - mild pyramidal insufficiency on the left side, Babinska's symptom positive on the left side. The patient showed superficial sensory disturbances in the left side of the body. In a CT scan was formed ischemic zone with hemorrhagic imbibition in the ACM dextra pool, formed ischemic zones in the ACP dextra pool. In MRI was edema of the right hemisphere of the brain in the back of the corpus callosum, in the back of the midbrain.

The patient was prescribed antihypertensive therapy with further improvement in health condition.

**Summary.** This case describes rare disease – PRES– and demonstrates that it could be hard to diagnose and could be successfully treated if diagnosis is confirmed as soon as possible with no complications for patient an her pregnancy.

**Conclusion.** This case report highlights the seriousness of acute hospitalization of patients with simmilar symptomatics, particularly in patients with pregnancy. PRES is a life threatening condition which requires extensive systemic evaluation, careful neurological function monitoring and rapid treatment.

## A RARE CASE OF COLLET-SICARD SYNDROME SECONDARY TO BOERHAAVE'S SYNDROME

Author: *Rahul Penumaka*<sup>1</sup>

Scientific research supervisor: Dr. *Chandra Puli*<sup>2</sup>

<sup>1</sup> *Imperial College London, United Kingdom*

<sup>2</sup> *Barking Havering and Redbridge Hospital, United Kingdom*

**Keywords.** Boerhaave's syndrome, Collet-Sicard syndrome, cranial nerve dysfunction, oesophageal perforation.

**Introduction.** We report a case of a patient presenting with Boerhaave's syndrome who developed a rare neurological complication, Collet-Sicard syndrome.

**Case Description.** A 30-year-old male presented with a two-day history of acute onset, severe abdominal pain, and vomiting. On admission, he was pyrexia and tachycardia. A CT of the chest, abdomen, and pelvis showed air in the mediastinum and upper abdomen as well as considerable mediastinitis extending into the neck. CT with gastrografin showed extravasation of contrast into the mediastinum, indicating an oesophageal perforation. The patient was diagnosed with Boerhaave's syndrome and admitted to the ITU. The patient then underwent a diagnostic laparoscopy with washout and drain placement, followed by an OGD with insertion of a fully covered oesophageal stent. The stent was removed after two weeks but the patient had residual dysphagia related to neuromuscular palatal and tongue dysmotility.

**Summary.** The patient was diagnosed with Collet-Sicard syndrome, a very rare condition involving unilateral palsy of the lower cranial nerves. In this patient, it was likely caused by mediastinitis that extended to the internal jugular foramen and led to temporary paralysis of cranial nerves IX, X, XI, and XII. Eventually, control of the perforation led to the patient regaining normal neurological function. Known causes of Collet-Sicard syndrome include various tumours, traumatic events, and inflammatory processes. However, we believe this to be the first case highlighting that Collet-Sicard syndrome can arise as a complication of an oesophageal perforation and its treatment.

**Conclusion.** Clinicians should consider this possible complication when managing patients with oesophageal perforations.

## ACUTE PERICARDITIS AFTER PERCUTANEOUS CORONARY INTERVENTION: A CASE REPORT

Author: *Greta Rodevič*<sup>1</sup>

Scientific research supervisors: Dr. *Povilas Budrys*<sup>1,2,3</sup>, Prof. *Giedrius Davidavičius*<sup>1,2,3</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Clinic of Cardiac and Vascular Diseases, Lithuania*

<sup>3</sup> *Vilnius University hospital Santaros klinikos, Lithuania*

**Keywords.** Post-cardiac injury syndrome, pericarditis, percutaneous coronary intervention.

**Introduction.** Post-cardiac injury syndrome (PCIS) is a secondary pericarditis resulting from the injury of the pericardium and can be present with or without pericardial effusion. Percutaneous coronary intervention (PCI) is known as a possible trigger of pericardial inflammation. Less than 0.2% of PCI procedures are complicated by pericarditis.

**Case Description.** A 58-year-old man was admitted to the hospital for the PCI of the chronic total occlusion of left anterior descending (LAD) artery due to the chronic coronary syndrome. Three months ago he underwent coronary angioplasty of the right coronary artery. An initial electrocardiogram (ECG) was unremarkable. PCI attempt was unsuccessful as operator could not wire the true lumen distal to the CTO. There were no procedure related complications observed at the end of PCI attempt and patient was symptom free. Six hours after interventional procedure the patient complained of severe chest pain. The ECG demonstrated ST-segment elevation in anterior and lateral leads. Troponin I was mildly elevated but coronary angiogram did not reveal impairment of collateral blood flow to the LAD territory. Because of pericarditic chest pain, typical ECG findings and pericardial effusion with elevated C-reactive protein, the diagnosis of acute pericarditis was established and a course of nonsteroidal anti-inflammatory drugs (NSAIDs) was initiated. Chest pain was significantly relieved by ibuprofen and ST-segment elevation almost completely returned to baseline after three days of treatment. The patient was discharged in stable condition without chest pain on the fourth day after symptom onset.

**Summary.** Reported case demonstrates an atypical early onset of PCIS which manifested 6 hours after the unsuccessful PCI without complications. Pericarditis was effectively managed with NSAIDs.

**Conclusion.** Acute pericarditis is a rare complication of PCI. Despite the lack of specific clinical manifestation, post-traumatic pericarditis should be considered in patients with symptoms and signs of pericarditis and a prior history of iatrogenic injury or thoracic trauma.



## MALNUTRITION IN SHORT BOWEL SYNDROME

Author: **Justė Gavelytė**<sup>1</sup>

Scientific research supervisor: Prof. **Edita Gaveliene**<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Malnutrition; Short Bowel Syndrome.

**Introduction.** Malnutrition is defined as a state resulting from lack of intake or uptake of nutrition that leads to altered body composition (decreased fat free mass) and body cell mass leading to diminished physical and mental function and impaired clinical outcome from disease. Malnutrition can result from starvation, disease or advanced ageing, alone or in combination. Incidence of malnutrition is a common and serious issue responsible for the morbidity and mortality rate among hospitalized patients. Severe malnutrition is concurrent diagnosis of about 10% of SBS hospitalized patients.

**Case Description.** 2017-04 57-year-old Caucasian female came to the ED. Complaints: severe weakness, urinary retention, weight loss, stoma dysfunction.

2011- 2017 - 8 intestine surgeries caused by intestinal obstruction - 70cm of small bowel was left.

Status praesens: 175cm height, 38kg weight, conscious, sluggish; BP - 80/50mmHg, HBR - 110t/min, pulse - not-palpable; skin is dry, no turgor; muscle mass significantly reduced, cachectic. Laboratory results - hypoproteinemia, electrolyte deficiency.

In ICU: infusion therapy, electrolyte correction, hemodialysis, enteral nutrition(EN), parenteral nutrition(PN), prevention of stress ulcers and thrombosis. After stabilization - moved to the department of malnutrition prevention and treatment(DOMPT).

In the DOMPT: continued PN, EN. Stated: patient is depended on PN due SBS. Results: gained 2kg of body mass, liquid and electrolyte imbalance corrected, normoproteinemia.

Patient was taught how to use PN at home and discharged. She visited dietologist regulary. Last visit - 2020-01: weight 52kg, BMI 18kg/m<sup>2</sup>, normoproteinemia, good QOL.

**Summary.** We present 57-year-old female with severe-malnutrition because of SBS. She was taught how to use PN at home. After 3-years of PN at home patient has gained 10kg of body mass.

**Conclusion.** Malnutrition is a common and serious condition among patients with SBS, leading to severe consequences. When taken in a timely manner, quality of life and the outcome of the disease can be improved. When residual length of the small intestine is not enough for EN only, PN should be applied as soon as possible.

## SEVEN ISCHEMIC STROKES UNTIL THE DIAGNOSIS OF ANTIPHOSPHOLIPID ANTIBODY SYNDROME

Author: *Marta Siliņa*<sup>1</sup>

Scientific research supervisor: Dr. *Alfrēds Lukša*<sup>2</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Vidzemes Hospital, Latvia*

**Keywords.** Antiphospholipid antibody syndrome, Recurrent stroke.

**Introduction.** Antiphospholipid antibody syndrome (APS) is an autoimmune condition characterized by venous or arterial thrombosis and/or pregnancy morbidity. For diagnosis at least one of the three antibody types must be evident in plasma or serum: anticardiolipin antibodies, lupus anticoagulants, anti- $\beta$ 2-glycoprotein-I antibodies. Stroke is the most frequent neurological manifestation of APS.

**Case Description.** 53-year-old male was admitted with a preliminary diagnosis of transient ischemic attack (TIA). Patient is complaining of general fatigue and impaired balance and gait for more than 4,5 hours. Examination reveals gaze palsy and tongue deviation to the left side, deep hemiparesis, and sensation impairment on the left side of the body and Babinski reflex in the left foot. Native CT, MR and MRA of the brain reveal acute ischemic changes in the right middle cerebral artery territory as well as multiple old ischemic lesions in the right frontal, parietal and occipital lobes as well as left parietal lobe. In the past 13 years patient has been hospitalized with TIAs 6 times. Symptoms of each of those TIAs coincide with old ischemic lesions seen on CT and MR, suggesting that each of them was a stroke. Other investigations, including native CT and echocardiography reveal diffuse changes in lungs, left ventricle diastolic dysfunction, mitral and aortic valve regurgitation. In suspicion of systemic disease, laboratory tests for APS are done, where Anti-Cardiolipin IgA, IgM, IgG come back positive.

**Summary.** This case report demonstrates a young man with undiagnosed symptomatic APS, resulting in multiple strokes, misdiagnosed as TIAs. Early diagnosis of APS and prophylactic treatment is crucial to prevent recurrent thrombosis.

**Conclusion.** In the case of symptomatic APS, early diagnosis is crucial to exclude recurrent thrombosis by implicating secondary prevention, where the vitamin K antagonists are preferred over antiaggregant or direct oral anticoagulant treatment.

## VERTEBROBASILAR STROKE IN A YOUNG PATIENT

Author: **Jedidiah Viswaz Solomon Prabahar**<sup>1</sup>  
Scientific research supervisor: Dr. **Kristaps Jurjāns**<sup>2,3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Neurology department, Latvia*

<sup>3</sup> *The Red Cross Medical College of Rīga Stradiņš University, Latvia*

**Keywords.** Patent Foramen Ovale, Stroke, Migraine, Autonomic Dysfunction.

**Introduction.** Patent foramen ovale (PFO) is a congenital cardiac defect. It occurs in up to 25-30% of people. In a small population, a variety of clinical manifestations may be associated with PFO such as cryptogenic stroke, migraine, autonomic dysfunction etc.

**Case Description.** We present the case report of a 22-year-old patient who had a vertebrobasilar stroke. For four months the patient had had migraines with aura and short episodes of tingling in the left extremities and around the mouth along with complaints of emotional lability, mood swings, sleeping disturbance. She was admitted by ambulance due to sudden severe dizziness and nausea. Neurological examination revealed binocular horizontal nystagmus to the right and postural instability. An MRI showed acute ischemic lesions in the right cerebral hemisphere. After admission to the stroke unit, she underwent a thorough etiopathogenetic examination. Trans-oesophageal echocardiography revealed PFO. The other investigations showed insignificant findings. According to the Causative Classification System for Ischemic Stroke, stroke was classified as possible cardioembolic. PFO closure was scheduled 2 weeks post-discharge. In the two weeks, she was readmitted thrice for different nonspecific complaints, associated with autonomic dysfunction. After the surgery, she underwent physical and emotional rehabilitation. The psychological impact was significant, and she required prolonged psychotherapy. Three months post-discharge, she has autonomic episodes but no complaints of migraines and is physically independent.

**Summary.** A patient presenting with neurological and autonomic complaints was diagnosed with a vertebrobasilar stroke of possible cardioembolic origin (PFO). PFO closure, psychotherapy and rehabilitation helped the patient immensely.

**Conclusion.** Stroke in young patients is rare. A multifaceted diagnostic approach is required to identify the aetiopathogenesis and provide the right treatment. The treatment must endeavour also to provide independence and quality of life post-treatment in such patients. Psychological support and considering associated differential diagnoses were important.

## DERMOSCOPIC RAINBOW PATTERN SIGN AND SIASCOPIIC FEATURES OF ANGIOMATOID FIBROUS HISTIOCYTOMA

Author: *Simas Stikloraitis*<sup>1</sup>

Scientific research supervisors: Prof. *Skaidra Valiukevičienė*<sup>1,2</sup>,  
Dr. *Jurgita Makštienė*<sup>1,3</sup>, Dr. *Jokūbas Liutkus*<sup>1,2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Department of Skin and Venereal Diseases, Hospital Kauno Klinikos, Lithuania*

<sup>3</sup> *Department of Pathological Anatomy, Hospital Kauno Klinikos, Lithuania*

**Keywords.** Angiomatoid fibrous histiocytoma, rainbow pattern, histopathology, dermoscopy, siascopy.

**Introduction.** A case report of a patient diagnosed with angiomatoid fibrous histiocytoma, with rainbow pattern sign on dermoscopy.

**Case Description.** A 31-year-old HIV-negative patient was referred to a tertiary dermatology clinic due to a slow-growing lesion on the right forearm, which bled upon trauma, present for 2 years. Physical examination revealed a blue-grey nodule 11×8 mm in size. On dermoscopy, a central brown structureless area with white structures, peripheral blue-gray homogenous area, regular radial streaming, rainbow pattern and crystalline structures were seen. Siascopic examination registered blood displacement with erythematous blush and dermal melanin. Wide local excision and histopathologic investigation were performed. Microscopically, a poorly demarcated tumor of the reticular dermis was seen, with nests of spindle and ovoid cells dispersed within the collagen fibers, Touton giant cells, sparse erythrocyte-filled cystic spaces and abundant hemosiderophages. Diagnosis of angiomatoid fibrous histiocytoma was established, with no recurrence at 6 months follow up.

**Summary.** The rainbow pattern dermoscopic sign present in angiomatoid fibrous histiocytoma – a rare soft tissue neoplasm with histologic features of nodular distribution of ovoid and spindle cells with blood-filled cystic cavities. Few specific clinical and dermoscopic features have been previously described, making early diagnosis challenging.

**Conclusion.** Angiomatoid fibrous histiocytoma (AFH) is a rare tumor of intermediate biological behavior, most commonly occurring in children and young adults. It is difficult to diagnose clinically, with no established dermoscopic criteria. To our knowledge, this is the first description of the rainbow pattern dermoscopic sign for AFH, a feature most strongly associated with Kaposi sarcoma, however rarely appearing in melanoma and other cutaneous tumors.

## MOYAMOYA DISEASE: A RARE CAUSE OF CEREBRAL INFARCTION

Author: *Magdalēna Mudule*<sup>1</sup>

Scientific research supervisor: Dr. *Ilga Ķikule*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Neurology and Neurosurgery Department, Rīga East Clinical University Hospital, Latvia*

**Keywords.** Moyamoya Disease, Cerebral Infarction, Rare Disease.

**Introduction.** Moyamoya disease is a rare vascular pathology. It is more common in East Asia – Japan, South Korea, China-, much less common in the Western population. The objective of this case is to highlight the symptoms and a possible presentation of this rare disease, that is one of the potential causes of cerebral infarction.

**Case Description.** A 37-year-old woman was admitted to the hospital with complaints of a tingling sensation and weakness in the limbs of the left side of the body, especially the arm. Episodes of these symptoms had started 2 years ago, but had become more severe in the last 6 months. A history of occipital headaches is also present. On objective examination, the patient's blood pressure was 140/80 mmHg, neurological examination revealed left side hemiparesis, less muscle strength in the left leg, positive Babinski reflex in the left foot and hyperesthesia in the right leg. With suspicions of a demyelinating central nervous system disease, Methylprednisolone therapy had been initiated, which caused a worsening of the condition. A head CT, MRI, duplex dopplerography for the extra and intracranial blood vessels revealed various pathological changes. A diagnosis of Moyamoya vasculopathy was proved with cerebral pan-angiography. Treated with antiaggregants, the patient's condition improved, and she was discharged for further rehabilitation.

**Summary.** After many differential diagnoses, the patient admitted to the hospital with neurological symptoms in the left side was diagnosed to have Moyamoya disease. Her condition improved after antiaggregant therapy and physiotherapy.

**Conclusion.** Imaging studies have a great importance in determining the etiology of the underlying disease in specific neurological symptoms. In difficult cases rare diseases should be considered. Complications of Moyamoya disease include migraine like headaches, ischemic strokes, and transitory ischemic attacks. The goal of the therapy is to prevent further complications.

## CASE REPORT: DIFFUSE KAPOSI'S SARCOMA IN CAUCASIAN WOMAN WITH AIDS

Author: *Alise Lavrinovica*<sup>1</sup>

Scientific research supervisors: Dr. *Signe Plāte*<sup>2</sup>, Dr. *Evita Gašenko*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Oncology centre of Latvia, Latvia*

**Keywords.** Endemic Kaposi's sarcoma, diffuse Kaposi's sarcoma, Caucasian woman, AIDS, systemic chemotherapy.

**Introduction.** Kaposi sarcoma (KS) is an angioproliferative neoplasm that is caused by infection with Kaposi sarcoma-related herpesvirus (KSHV) also known as Kaposi's sarcoma-associated herpesvirus-HHV8. The 4 epidemiologic subtypes of KS include classic, African endemic, immunosuppression-related, and AIDS-related KS. African endemic Kaposi's sarcoma (KS) is an aggressive subtype occurring among HIV-negative individuals in sub-Saharan Africa.

**Case Description.** A 29-year-old Caucasian female without chronic illnesses had called an ambulance with complaints of febrile fever, constipations and bloody stool over the last month. Patient had used antibacterial treatment without any effect. At that moment, the patient was stationed at Latvian Centre of Infectious Diseases. Due to numerous investigations patient was diagnosed with HIV 1 infection CIII stadium with CD4 level 31 cells/μl. At the time of hospitalization patient presented with general lymphadenopathy and multiple opportunistic infections. Patient was treated with Trimethoprim/Sulfamethoxazole, Clarithromycin, Fluconazole and Paracetamol. Patient was prescribed with highly active antiretroviral therapy (HAART) – Dolutegravir, Abacavir, Lamivudine. During hospitalization patient had developed numerous purple skin nodules which covered the whole body. Skin biopsy was performed which confirmed diffuse form of KS. After two months of HAART patient's CD4 level was 176 cells/μl. Consilium of oncologists prescribed systemic chemotherapy with liposomal Doxorubicin 30 mg. Nine cycles of systemic chemotherapy were performed, and the area of nodules had decreased.

**Summary.** This clinical case demonstrates patient with AIDS and presentation of diffuse form of AEKS which according to available data has not been reported in Latvia.

**Conclusion.** The patient had experienced improvement of her condition after systemic chemotherapy with liposomal Doxorubicin. Although she showed increased CD4 levels after HAART, afterwards therapy was changed due to increased HIV viral load in the patient's blood from 8.1 copies/ml to 46.0 copies/ml.

## IATROGENIC SECONDARY DACRYOCYSTITIS DUE TO MAXILLARY SINUS POLYP

Author: *Sofija Korņilova*<sup>1</sup>

Scientific research supervisor: Dr. *Jekaterina Kondratiško*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *AIWA Clinic, Latvia*

**Keywords.** Dacryocystitis, tearing, maxillary sinus, polip, endo-DCR.

**Introduction.** Secondary dacryocystitis is a rare but serious complication, that requires multidisciplinary approach from both ophthalmologic and otorhinolaryngologic sides.

**Case Description.** Patient (male, 39 years old) has referred to ENT specialist due to prolonged unilateral breathing disruption that was exacerbated in horizontal position, nasal voice and snoring. ENT surgery in anamnesis. Complains intensified during nasopharyngitis and did not disappear with improved somatic wellbeing. Chronic tearing is exacerbated during acute rhinitis episodes.

**Summary.** After the symptoms were reduced by antibiotic therapy, ophthalmological functional tests were performed. The tear drainage was absolutely blocked, and discharge from lacrimal sac indicated chronic inflammation. Simultaneously, ENT-specialist endoscopically diagnosed giant polyp in left sinus.

CT: giant polyp on the left side, that has completely filled in left maxillary sinus with prolapse to the middle and inferior meatus, completely filling left nasal passage up until nasopharynx. The passage of contrast through left lacrimal drainage system was also impacted, as there was no contrast in nasolacrimal canal. Based on the CT findings it was concluded that the mechanical disruption of the lacrimal canal is located in the projection site of maxillary sinus opening. Radiologist has suggested that it was due to sinus contents that the lacrimal drainage was blocked.

Surgery: polyp excision from maxillary sinus with following diagnostic probing. After localisation of precise site of nasolacrimal canal disruption, endoscopic dacryocystorhinostomy (endo-DCR) with catheterisation was performed.

**Conclusion.** Complications after sinus surgeries are quite common. However, differentiation and solution of this type of problem is prime example of multidisciplinary approach. A team that consists of otorhinolaryngologist, ophthalmologist and radiologist is required to precisely locate the source of the problem and choose the right treatment tactics.

## MESALAZINE-INDUCED INTERSTITIAL NEPHRITIS. CLINICAL CASE

Authors: *Monika Matuliauskaitė*<sup>1</sup>, *Agnė Čibirkaitė*<sup>1</sup>, *Paulina Tekoriutė*<sup>1</sup>

Scientific research supervisor: Prof. *Laimas-Virginijus Jonaitis*<sup>1</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Mesalazine, Inflammatory bowel disease, Interstitial nephritis.

**Introduction.** 5-Aminosalicylic acid (5-ASA) preparations are widely used in the treatment of inflammatory bowel diseases. The most commonly used medicine is mesalazine. Overall, it is a very safe drug with few side effects. A rare side effect of this drug is kidney damage (interstitial nephritis). In this case report, we present a clinical case of mesalazine induced interstitial nephritis.

**Case Description.** In 2020 a 56-year-old patient was hospitalized in Lithuanian University of Health Sciences Kaunas Clinics because of renal failure, hyperkalemia (6.5 mmol / l), uremia (35 mmol / l), increased creatinine (1070 μmol/l / l) and anuria. It was known that this patient had ulcerative colitis for 20 years and used mesalazine for treatment. In 2019 the patient was diagnosed with mesalazine-induced interstitial nephritis which was confirmed by biopsy. Due to that, treatment with mesalazine was discontinued. In 2020 after the patient felt symptoms of acute colitis, he started using mesalazine on his own, resulting in worsening of his health condition and impaired renal function. The patient was treated with hemodialysis, corticosteroids-positive dynamics were noticed. The patient was released for further monitoring. Significant improvement was observed during the planned consultation. Therefore, biological therapy is planned for further treatment of ulcerative colitis.

**Summary.** In this case we presented the patient with renal failure due to acute interstitial nephritis, confirmed by biopsy, after the use of mesalazine to treat ulcerative colitis. Improvement of renal function occurred after discontinuation of mesalazine and administration of corticoids.

**Conclusion.** In conclusion, users of 5-ASA have an increased risk of renal disease. It is important to monitor creatinine levels regularly during treatment with 5-ASA to prevent irreversible renal impairment.



## INTERSTITIAL LUNG DAMAGE DUE TO COCAINE ABUSE

Authors: *Žilvinas Krivickas*<sup>1</sup>, *Liveta Sereikaite*<sup>1</sup>, *Simas Stikloraitis*<sup>1</sup>

Scientific research supervisors: *Nerijus Klimas*<sup>2</sup>, *Mindaugas Strazinskas*<sup>3</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Department of Anesthesiology and Intensive care, Klaipėda Seamen's Hospital, Lithuania*

<sup>3</sup> *Faculty of Health Sciences, Klaipėda University, Lithuania*

**Keywords.** Cocaine, amphetamine, ecstasy, interstitial lung disease.

**Introduction.** A case report of a male patient who was diagnosed with interstitial lung disease due to illicit stimulants abuse.

**Case Description.** A 33-year-old man was found sleeping breathlessly. Resuscitation was initiated by his girlfriend until the paramedics arrived. Naloxone was injected. Signs of respiratory failure began appearing upon arrival at the emergency room. The patient was somnolent through examination, his limbs were cyanotic, saturation was 49 percent. Positive dynamics was observed after another naloxone injection. Toxicology screen had been carried out. Test results were positive for cocaine, amphetamine, 3,4-Methylenedioxymethamphetamine (MDMA), benzodiazepines, and opioids. A chest roentgenogram and a computed tomography scan show altered lung tissue. CT images show infiltration of ground-glass opacity (GGO) predominating in central parts of the lungs in all lobes. The radiograph shows infiltrates of GGO and interstitial edema in all parts of the lungs. Positive dynamics was observed radiologically during the treatment and lung aeration increased on both lungs in chest x-rays performed later.

**Summary.** Illicit stimulants, such as cocaine, amphetamine, and their derivatives (e.g., “ecstasy”), continue to exact heavy toll on health care. Abuse of both inhaled and intravenous forms of these substances can result in a variety of acute and chronic injuries to practically every part of the respiratory tract, leading potentially to permanent morbidities as well as fatal consequences - including but not limited to nasal septum perforation, pulmonary hypertension, pneumothorax, pneumomediastinum, interstitial lung disease, alveolar hemorrhage, reactive airway disease, pulmonary edema, pulmonary granulomatosis, infections, foreign body aspiration, infections, bronchoconstriction, and thermal injuries.

**Conclusion.** In the meantime, health care providers must be aware of the host of respiratory toxidromes-associated stimulant abuse to provide timely diagnosis and efficacious treatment.

## IDIOPATHIC OSTEOPOROSIS IN MEN – 5 YEARS TREATMENT WITH DENOSUMAB AFTER BISPHOSPHONATES: A CASE REPORT

Author: *Diāna Pokšāne*<sup>1</sup>

Scientific research supervisor: Dr. *Ingvars Rasa*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Osteoporosis, men, denosumab.

**Introduction.** Osteoporosis is a musculoskeletal disease characterized by decreased bone mineral density (BMD) and increased risk of fragility fractures. Osteoporosis medications selection for men is limited. One of the treatment options is Denosumab (Dmab), a human monoclonal antibody to the RANKL, an osteoclast differentiating factor.

**Case Description.** The non-smoking, non-alcohol use 59 yrs men with BMI 23,5kg/m<sup>2</sup> from 28 yrs have 11 peripheral bone fractures (e.g., finger phalanges, clavícula). Secondary causes, such as hyperparathyroidism and hypogonadisms, were excluded. The final diagnosis was idiopathic osteoporosis with multiple fractures. In 2008-2015 pt was treated with bisphosphonates (alendronate and risedronate), where BMD at first was increased, but then was plateau phase, where BMD increasing not observed. From 2015 to nowadays, pt treats with Dmab 60mg s/c injections two times per year. Spin and hip BMD at DXA scans were analyzed before, during, after treatment with Dmab, where BMD, in the end, was increased in lumbar spine L<sub>1</sub>-L<sub>4</sub> in 4,6% and total mean hip in 4,2%.

**Summary.** Diagnosis and treatment of osteoporosis in men remain a significant challenge. In future, the men osteoporosis development needs to be more research. Dmab is suitable for all patients with osteoporosis after bisphosphonates therapy, including men. Treatment is easy to implement. Fractures in dynamics have decreased, quality of life has improved.

**Conclusion.** Dmab effectively increases BMD at the lumbar spine and in the total mean hip in men with osteoporosis. One of the disease causes may be COL1A, COL1A2, WNT1, LRPR5, LRP6 gene mutation that causes early-onset osteoporosis (EOOP), which affect bone structure and metabolism.

## 25-YEAR-OLD MAN WITH HOMOZYGOUS MTHFR MUTATION, HOMOCYSTEINEMIA

Author: *Antra Sandere*<sup>1</sup>

Scientific research supervisor: Dr. *Daiga Auziņa*<sup>1</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

**Keywords.** Homozygous MTHFR mutation, homocysteinemia.

**Introduction.** The MTHFR mutation is associated with elevated blood levels of homocysteine and low levels of folate and other B vitamins. The C677T mutation is very rare. The most common problems associated with this mutation are cardiovascular and thromboembolic diseases, depression, anxiety, bipolar disorder.

**Case Description.** The 25-year-old man turns to the doctor because he noticed darker areas on the finger joints and elbows. Objectively BMI 33.5, clinical chemistry(05.02.20)- Homocysteine- 40.75mkmol/L, urea-503mkmol/L, HOMA-3.56, LDL-4.48mmol/L. The patient is prescribed a low glycemic index diet, MethylB12/Methylfolate(1000mcg/400mcg) x2. In the consultation after 6months BMI 31.4, in blood tests(01.07.20)- homocysteine 13.9mkmol/L, urea-463mkmol/L, HOMA-2.53, LDL-3.97mmol/L. After which the vitamins are removed for 3 months to observe the dynamics. In addition, fish oil(EPA700mg; DHA500mg) is prescribed. In repeated blood tests(04.10.20)- Homocysteine-18.21 μmol/L, LDL-4.01 mmol/L, Folic acid-3.6ng/ml, B12-499pg/ml. The patient managed to reduce the BMI to 29.6. The patient is prescribed in the treatment of folic acid 400mcg x2, vitamin B12 in the form of courses every 3 months 100mcgx2, fish oil, ATEROLIPx1. The patient underwent genetic analysis for various thrombophilia genes, from which a homozygous mutation C677T T/T was found in the MTHFR gene. The patient's mother (homocysteine15.46mkmol/L) and brother (homocysteine12.17mkmol/L) were also examined, and there is no information about the patient father.

**Summary.** According to the results of clinical chemistry, there was a suspicion of a congenital tendency to homocysteinemia, which was also confirmed by the results of genetic analysis (homozygous MTHFR mutation). This patient has a mutation detected before irreversible changes have occurred and the risks can be reduced to population levels with appropriate therapy.

**Conclusion.** Timely diagnosis can protect patients from irreversible consequences. The patient has prevented his risk of cardiovascular events. As the patient is male he may have problems with sperm quality.

## SUCCESSFUL TREATMENT OF MICROADENOMA AND ACROMEGALY WITH SOMATOSTATIN ANALOGS (SSA) MONOTHERAPY FOR 7 YEARS: A CASE REPORT

Authors: *Marta Dubovska*<sup>1</sup>, *Diāna Pokšāne*<sup>1</sup>  
Scientific research supervisor: Dr. *Ingvars Rasa*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Acromegaly, somatostatin analogues, growth hormone, IGF-1, microadenoma.

**Introduction.** Acromegaly is a rare chronic disease caused by hypersecretion of growth hormone (GH), that results in increased secretion of insulin-like growth factor-1 (IGF-1). 70% of the tumours were macroadenomas. The diagnosis of acromegaly is delayed by 5–10 yrs from the time of the first symptoms. The first-choice treatment usually is neurosurgical treatment with/without pre-treatment or post-surgery with SSA.

**Case Description.** A 64 yrs older woman during 20 yrs regularly visited her GP with gradually increasing acromegaly symptoms. 13 yrs later, she was sent to consultation with an endocrinologist Clinical University Hospital. Lab data from beginning: IGF-1 was 1194.0 (N=75–212) ng/ml, GH was 9.2 (N=0.06–5.0) ng/ml, prolactin-N. Pre-/post-contrast MRI scans showed endosellar into pituitary microadenoma, 5×6mm, located basal to the cavernous sinus. Final diagnosis: Somatotropynic endosellar pituitary microadenoma, acromegaly. Pnt has treated with Sandostatin LAR i/m 20/40 mg every 21–30 days. Blood tests showed significant IGF-1 decrease by 4.9 times compared to baseline analyses. Later IGF-1 and GH levels remain in a normal range. We made pre-/post-contrast MR every 1–2 yrs, scans showed, that adenoma became cystic, decreases in volume. During 7 yrs, size of adenoma reduces by 32%. Pnt has several co-morbidities: e.g., hypertension, secondary cardiomyopathy, chronic heart failure with normal EF, dyslipidemia, osteoporosis, carpal tunnel syndrome, postoperative hypothyroidism after thyroidectomy, gallstone disease.

**Summary.** This case report shows and confirms the statement that using only noninvasive monotherapy with SSA can achieve a successful and long-term good result.

**Conclusion.** The clinical case highlights the possibilities of pharmacological monotherapy with SSA in acromegaly case with microadenoma. By careful titration of SSA doses and interval changes, it is possible to reduce hormonal activity and realize the antiproliferative, adenoma-reducing effect.

## THE USE OF DIRECT NON VITAMIN K ANTAGONISTS IN TRAUMA PATIENT: A CASE REPORT

Authors: *Ruta Marija Nadisauskaite*<sup>1</sup>, *Tautvydas Vaitkus*<sup>1</sup>  
Scientific research supervisor: Assoc. Prof. *Edita Masanauskiene*<sup>1</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Trauma, hematoma, anticoagulant therapy, non vitamin K antagonist, rivaroxaban.

**Introduction.** The aging population and growing numbers of patients with cardiovascular diseases worldwide have caused an increasing demand for anticoagulation therapy. Direct non vitamin K antagonists have been licensed for a long-term prevention and treatment of thromboembolism. However, the clinical evidence for its impact in trauma cases is lacking.

**Case Description.** We present a 76-year-old female trauma patient who had been using non vitamin K antagonist prior the trauma.

**Summary.** In this case report, we discuss the impact of non vitamin K antagonist in trauma patients; the development of complications as well as the treatment.

**Conclusion.** Due to use of non vitamin K antagonist and other drugs, the patient developed a massive, subcutaneous hematoma in her buttocks.

## EXTENSIVE GASTRIC ULCERATION WITH BLEEDING CAUSED BY SHORT-TERM USE OF NSAIDs

Authors: *Aistė Šakalytė*<sup>1</sup>, *Monika Matuliauskaitė*<sup>1</sup>

Scientific research supervisor: Prof. *Laimas-Virginijus Jonaitis*<sup>1</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Stomach cancer, ulcer, nonsteroidal anti-inflammatory drugs.

**Introduction.** Nonsteroidal anti-inflammatory drugs (NSAIDs) are a broad class of drugs whose analgesic, antipyretic and anti-inflammatory effects are used to treat a variety of diseases. Despite their widespread use, NSAIDs can cause many side effects, often affecting the gastrointestinal tract.

**Case Description.** A 63-year-old man was hospitalized due to heavy vomiting of blood clots. The patient also complained of nausea, weakness, loss of appetite, weight loss, pain under the left rib cage. It was known that the patient was diagnosed with intercostal nerve neuralgia, for which NSAIDs were prescribed.

According to the patient, he used a significant amount of various different pills of NSAIDs for pain relief every day. After anamnesis, it was identified that the patient had smoked for 45 years at least two packs of cigarettes per day, drinks up to 7-8 cups of coffee per day, eats irregularly and experiences stress at work.

Just 12 days after starting NSAIDs, sudden nausea occurred and the patient developed acute vomiting with blood clots. Fibroesophagogastroduodenoscopy revealed extensive ulceration involving approximately 1/3 of the gastric circular lumen, including the small curve and posterior wall. The primary suspicion was stomach cancer, biopsy was taken from the edges of the ulcer. Biopsy showed active (++) chronic gastritis with active lymphoid hyperplasia. A serological test confirmed *H. pylori* infection. Medication was applied and a positive clinical effect was obtained.

**Summary.** This case report shows the importance of taking NSAIDs with moderation and according to the prescription.

**Conclusion.** NSAIDs often cause peptic ulcers and life-threatening complications that rarely but can develop even in an extremely short time. It is important to prescribe NSAIDs only when there are indications and after consideration of patient's risk factors for the development of ulcerative lesions and their complications.

## EFFECTIVENESS OF VISION THERAPY IN CHILDREN WITH ACCOMMODATIVE INSUFFICIENCY

Authors: *Monika Jasinskaitė*<sup>1</sup>, *Liveta Sereikaite*<sup>1</sup>, *Dovilė Mišeikytė*<sup>1</sup>

Scientific research supervisor: *Rasa Bimbienė*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Pasvalys Hospital, Lithuania*

**Keywords.** Accommodative insufficiency, vision therapy, children.

**Introduction.** We present a case report of an 11-year-old girl diagnosed with accommodative insufficiency, who experienced unstable visual acuity, headaches.

**Case Description.** An 11-year-old patient experienced unstable visual acuity in both eyes and headaches. During the first visit visual acuity (Snellen chart, Landolt C optotype) was 0,4 in both eyes, the best-corrected visual acuity with sph +0,5 0,6. Neither with a minus nor with a plus correction, better vision could be obtained. Refraction in cycloplegia was 0,75 in both eyes, the amplitude of accommodation (AA) 0. Full-field visual testing results were normal. On slit-lamp examination, the findings of the anterior pole were within normal limits. Color vision and intraocular pressure were normal during both examinations. Dilated fundus examination showed optic nerve disk (OND) in pink color, the borders of OND were clear and well defined. No neurological symptoms were observed. The patient received visual therapy to increase the amplitude of accommodation, reduce accommodation spasm, strengthen the muscles of the eyes and the whole body. After the first stage of rehabilitation visual acuity improved to 0,9, with best correction 1,0, AA 6. After the second stage of rehabilitation visual acuity was 1,0 in both eyes, AA 16. A year later patient experienced the same accommodative insufficiency. After the same vision therapy, visual acuity improved to 1,0, AA 14,0.

**Summary.** Accommodative disorders are commonly encountered in pediatric eye care practices and the two most common accommodative disorders are accommodative insufficiency and accommodative infacility. Accommodative insufficiency is a condition in which the amplitude of accommodation is less than expected for a nonpresbyopic patient's age, whereas accommodative infacility is a condition in which the latency and speed of the accommodative response are abnormal compared to normative clinical data.

**Conclusion.** Vision therapy is effective in improving accommodative amplitude and accommodative facility in school-age children with symptomatic accommodative dysfunction.

## MALNUTRITION IN ONCOLOGY PATIENT

Author: **Justė Gavelytė**<sup>1</sup>

Scientific research supervisor: Asoc. Prof. **Edita Gaveliene**<sup>1</sup>

<sup>1</sup> *Vilnius University, Lithuania*

**Keywords.** Malnutrition; Oncology.

**Introduction.** Malnutrition, defined as deficiency of energy, protein, or other nutrients, has always been neglected in clinical practice even though it also imposes a threat on public health. Malnutrition in oncology patients leads to complication, poorer QOL, increased cost to healthcare systems. Also it is not only a consequence of disease but it can also exacerbate the progress of disease or even be causative. Oncology patients are 1.7 times more likely to be malnourished than other hospitalized patients.

**Case Description.** 2019-04 50-year-old Caucasian male was hospitalized in the department of malnutrition prevention and treatment (DOMPT). Complaints: weight loss, inability to eat after maxillary cancer resection.

In 2016 patient was diagnosed with carcinoma cavis oris, maxillary resection and chemotherapy was applied. Afterwards he was able to eat only fluids. 2017 - recurrence of the disease, treated with chemotherapy. From the beginning of illness patient lost more than 70kg of body mass.

Status praesens: 180cm height, 42,8kg weight, BMI 14kg/m<sup>2</sup>, body fat 3%, muscle mass 23,4 kg. BP - 100/55mmHg, HBR - 75t/min. Laboratory results - hypoproteinemia.

In DOMPT: Percutaneous endoscopic gastrostomy (PEG) inserted and enteral nutrition(EN) started. After 2-weeks patient was discharged and was taught how to continue EN through PEG. After 3 months: weight 46kg, body fat 3,1%, muscle mass 25kg.

**Summary.** We present case report of malnutrition in oncology patient. Patient had difficulty to eat because of carcinoma cavis oris, later had PEG inserted and was able to get EN. Patient was able to live without starvation.

**Conclusion.** Unfortunately, miss of malnutrition risk in cancer patients occurs quite often. There are studies in Europe that shows that only 1 in 3 cancer patients at risk of malnutrition received nutritional support. An integral part of cancer care should be nutritional care and it is necessary to find an appropriate approach of nutrition of every patient individually.



## A RARE CASE OF WILSON'S DISEASE PRESENTING WITH NEUROLOGICAL SYMPTOMS WITHOUT HEPATIC INVOLVEMENT

Author: *Sushmethaa Vijayakumar Shanthi*<sup>1</sup>

<sup>1</sup> *Department of Internal Medicine, Madras Medical College, Rajiv Gandhi Government General Hospital, India*

**Keywords.** Neurowilson, Tremors, KF ring.

**Introduction.** Wilson's disease is a rare autosomal recessive disorder of copper metabolism due to mutation of ATP7B gene located on chromosome 13.

The objective of this clinical case report is to bring forth the importance of applying theoretical training to practice in diagnostics.

**Case Description.** A 14-year-old Indian female patient, who is a known case of Wilson's disease, was brought to the hospital with a history of generalized rigidity (progressive) for the past 3 months, altered sensorium for the past 1 month, inability to walk for the past 3 months and difficulty of speech for the past 15 days. Investigations revealed that her 24 hours urinary copper excretion was 275micromol/day, serum ceruloplasmin was less than 0.2mg/dl. She also presented with Kayser- Fleischer ring and her MRI revealed an acute infarct in periaqueductal gray- white matter. On examination, the patient was awake but not oriented and was unable to obey commands. Examination of other systems and vitals was normal. Patient was started on zinc, syndopa, baclofen and after obtaining a review from hepatology, was started on penicillamine. The patient is kept under strict observation to monitor her condition.

**Summary.** Neurological complications in Wilson's can vary extremely and a high index of suspicion is necessary to diagnose the condition effectively. Early treatment is crucial in preventing a debilitating outcome in the patient. It is important to keep the social factors in mind as storing of food and drinking water in copper pots is a prevalent practice in India.

**Conclusion.** This case of Neurowilson requires sharp skills on the clinician part with a keen eye for picking out the specific symptoms. Patient presented with advanced neurological complications and a failure to accurately diagnose her and start the appropriate treatment for her could have proved catastrophic.

## OCULAR PERFORATING INJURY: SURGICAL TREATMENT. PREVENTION OF POST-TRAUMATIC ENDOPHTHALMITIS

Authors: *Dovile Miseikyte*<sup>1</sup>, *Liveta Sereikaite*<sup>1</sup>

Scientific research supervisors: *Skaiste Rita Kuzmarskyte*<sup>2</sup>, Dr. *Arvydas Gelzinis*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Department of Ophthalmology, Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Ocular trauma, vitrectomy, eye surgery, endophthalmitis, penetrating eye injuries.

**Introduction.** A case of a patient with rupture of the right eyeball and foreign body inside the eye. After perforated eye injuries, endophthalmitis developmental frequency ranges from 2 to 17 %. So not even surgical treatment of the eye is indicated, but also prevention of post-traumatic endophthalmitis.

**Case Description.** A 7-year-old girl got a perforated right eye injury with a foreign body inside the eye in 2020-11-13. It was suspected to be a metal, but the bone of another man's finger was found. The eye was damaged by exploding firecrackers in another man's arm while girl was beside.

Orbit CT scan was made. It wasn't found intracranial bruising, severe changes of focal density characteristic of acute trauma or bone marrow. Right eyeball flattened, boundaries between cameras undifferentiated – signs of rupture. In its projection a 0,7×0,2cm foreign body is visible.

The surgical treatment was indicated, so in 2020-11-14 Pars plana vitrectomy (PPV) with foreign body removal and the corneoscleral suture were made. Postoperative prevention of endophthalmitis was indicated, so it was prescribed these intraocular medications: Dexamethasone 0,1% 3/day, Levofloxacin 0,5% 4/day, Cyclogyl 1% 2/day, Tobramycin 2/day; these intravenous medications: Diclofenac 0,1% 3/day, Cefuroxime 500 mg 3/day (7 days), Methylprednisolone 25 mg 1/day (11 days); and peroral Diclofenac 50 mg/day.

**Summary.** The patient got a perforated eye wound. It was necessary emergent admission to the hospital for emergent surgical repair of open globe injury, intravitreal antibiotic injection, and possibly systemic antibiotics to avoid serious complications, such as dissemination of inflammation or even sepsis.

**Conclusion.** Perforated eye injury is a dangerous disease, which requires good diagnostic and surgical skills. This wound becomes the gateway to infection, so it requires exact postoperative treatment.

## A CASE OF MOEBIUS SYNDROME

Author: *Mrinalini Devi G.K.V.*<sup>1</sup>

<sup>1</sup> *Government Villupuram Medical College, India*

**Keywords.** Sixth and seventh cranial nerve.

**Introduction.** Moebius Syndrome is congenital non-progressive complete or partial, unilateral or bilateral facial and abducens palsy with or without other cranial nerve palsies (III, V, IX, X) and physical abnormalities such as multiple limb malformations (syndactyly, brachydactyly, or absent digits and talipes).

**Case Description.** History - A 10 year old female child came to our hospital with chief complaints of inability to close the eyelids and inability to close lips since birth and difficulty in phonation since early childhood. History of dribbling of saliva and epiphora was present. There was no significant family, antenatal, natal or postnatal history.

General Examination - Head to foot examination revealed brachysyndactyly of second, third and fifth fingers with first web contracture in left hand and round mouth with anterior phrenulum of upper lip. Motor component of facial nerve was affected while sensory component was intact. Tongue was deviated to left and showed fissuring and fasciculations.

Ocular Examination - Anterior segment examination revealed lag ophthalmos with adequate Bell's phenomenon and medial canthal tendon laxity in both eyes. Corneal sensation was intact in both eyes. Child had 6/9p vision in both eyes, not improving with pinhole. Examination of extraocular movements revealed the child had horizontal gaze palsy and absence of abduction of both eyes. Color vision, field of vision and fundus were normal.

**Summary.** Investigations - X ray of left hand revealed presence of shortening of middle phalanx of second, third and fifth fingers.

Treatment - Child was instructed to tap lids close during sleep and advised to use artificial tears. Child has been scheduled for corrective surgery for brachysyndactyly and anterior phrenulum of upper lip.

**Conclusion.** This case is presented for its rarity.

## A CASE WITH DRESS SYNDROME

Authors: **Cansel Keskin**<sup>1</sup>, **Mehmet Kavcakar**<sup>1</sup>

Scientific research supervisor: Assoc. Prof. Dr. **Hulya Cenk**<sup>2</sup>

<sup>1</sup>*Pamukkale University, Turkey*

<sup>2</sup>*Department of Dermatology, Pamukkale University, Turkey*

**Keywords.** DRESS syndrome, allopurinol, amoxicillin, lincomycin.

**Introduction.** Drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome is a rare, potentially life-threatening hypersensitivity reaction characterized by fever, lymphadenopathy, rash, and end-organ involvements. The most frequently reported drugs are carbamazepine, allopurinol, sulfasalazine, phenobarbital, lamotrigine, and nevirapine.

**Case Description.** A 66-year-old man was admitted to the hospital with widespread maculopapular rash, desquamation, itching, and oliguria for the last ten days. His symptoms started 10 days after using allopurinol, amoxicillin, and lincomycin treatments due to an upper respiratory tract infection and hyperuricemia. The laboratory tests revealed high levels of C-reactive protein, creatinine, and liver enzymes. He was hospitalized with the prediagnosis of DRESS syndrome. The patient was started on topical and systemic corticosteroid treatments. A skin biopsy was performed with the prediagnoses of DRESS syndrome, erythrodermic mycosis fungoides, hypereosinophilic syndrome, chronic actinic dermatitis, and systemic allergic contact dermatitis. The biopsy revealed severe interface dermatitis and the patient was diagnosed with DRESS syndrome through the clinicopathological correlation. Two weeks after, the patient healed completely with the treatment. Also, the patient was advised never to take the same drugs again.

**Summary.** DRESS syndrome is a potentially life-threatening disease especially when the culprit drugs are not immediately ceased and the treatment is delayed. Mostly, drugs are the underlying reason in patients with pharmacogenetic susceptibility. Dermatologic signs and laboratory findings indicative of one or more end-organ involvements with a recent drug history should be alerting in terms of DRESS syndrome.

**Conclusion.** Since early diagnosis, treatment and immediate cessation of the culprit are of vital importance in DRESS syndrome, we found valuable to share this rare case of DRESS syndrome to improve the awareness about the disease.

## CORONARY ARTERY CHARACTERISTICS IN A PATIENT WITH STABLE CORONARY ARTERY DISEASE AND PREDIABETES

Author: *Sandra Paeglīte*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Kārlis Trušinskis*<sup>1,2</sup>,  
Dr. *Mairita Mažule*<sup>2</sup>, Dr. *Laima Caunīte*<sup>1,2</sup>, Dr. *Evija Knoka*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Prediabetes, coronary artery disease.

**Introduction.** Prediabetes is a component of metabolic syndrome with increased blood glucose levels that are higher than normal (HbA<sub>1c</sub>: 5,7-6,5%) but not high enough to be classed as diabetes. However, prediabetes is recognized as independent risk factor for cardiovascular diseases and vascular complications. Its prevalence in Europe is increasing 5,5%, but provisionally in 2045 - 6.1%. Although with lifestyle changes people can prevent type 2 diabetes and other complications. Also, Metformin therapy could be considered in high risk patients.

**Case Description.** This case report presents female patient 70 years old. She was undergoing planned elective percutaneous coronary intervention (PCI) and then intravascular ultrasound imagining (IVUS). Patient in anamnesis had arterial hypertension, atrial fibrillation, chronic heart failure and myocardial infarction. She used statin, ACE inhibitors, anticoagulant and beta blockers therapy. Patient had increased body mass index (BMI) 29,38 kg/m<sup>2</sup>, HbA<sub>1c</sub> 6,3% and low-density lipoprotein (LDL) 2,61 mmol/L. IVUS tissue content results showed vulnerable plaque - fibrotic 44,95%, lipidic 16,19%, necrotic 27,21%, calcified 3,37%. At discharge patient was informed about the significance of prediabetes. She was instructed to use metformin plus lifestyle modification. At 2 year follow up patient used only metformin therapy. HbA<sub>1c</sub> (5,90%) and LDL (2,15 mmol/L) was decreased, but BMI (31,89 kg/m<sup>2</sup>) increased. IVUS tissue content results became worse - fibrotic 39,01%, lipidic 16,95%, necrotic 28,17%, calcified 6,75%.

**Summary.** Only metformin administration did not improve coronary artery disease. Also, lifestyle needs to be changed.

**Conclusion.** The importance of lifestyle management was under-appreciated by this patient. She increased her BMI and IVUS tissue content still showed vulnerable plaque. She did not eat healthier and increase her daily physical activities. Although, under the influence of metformin therapy HbA<sub>1c</sub> levels decreased.

## HEREDITARY CARDIAC AMYLOIDOSIS - COMPREHENSIVE DIAGNOSTIC APPROACH (CASE REPORT)

Author: *Alise Matuzala*<sup>1</sup>

Scientific research supervisor: Dr. med. *Ainārs Rudzītis*<sup>2</sup>, Dr. *Valdis Ģībietis*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** AA amyloidosis, ATTR amyloidosis, cardiac amyloidosis.

**Introduction.** Amyloidosis is a condition caused by the misfolding and aggregation of precursor proteins with unstable tertiary structure as insoluble amyloid fibrils. In cardiac amyloidosis amyloid fibrils deposit in the extracellular space of the heart. Majority of clinical cardiac amyloidosis is caused by transthyretin and light chain amyloidosis, rarely it may be caused by serum amyloid A and apolipoprotein A-1 amyloidosis.

**Case Description.** A 69-year-old woman was admitted to tertiary care hospital with cerebral infarction in 2016. During her stay at the hospital an echocardiography finding raised suspicion of cardiac amyloidosis and follow-up heart MRI results were consistent with amyloidosis. Endomyocardial biopsy revealed immunohistochemical evidence of probable AA amyloidosis.

Over the years on the background of coronary heart disease patient developed heart failure symptoms. No primary inflammatory pathology had been identified as a cause of secondary AA amyloidosis. There was no conclusive data on the involvement of other organs and the clinical findings in this patient were uncharacteristic of systemic AA amyloidosis.

In June 2020 a myocardial <sup>99m</sup>Tc-PYP scintigraphy was positive for ATTR amyloidosis (visual Grade 3). Further genetic testing revealed TTR gene Val50Met mutation. Currently patient is enrolled in a clinical study to evaluate the efficacy and safety of vutrisiran in patients with ATTR amyloidosis with cardiomyopathy.

**Summary.** A patient with a history of cardiovascular conditions is diagnosed with AA amyloidosis. The diagnosis is questioned because of uncharacteristic clinical picture and no identifiable primary inflammatory condition. Years later myocardial scintigraphy results are positive for ATTR amyloidosis and genetic testing proves TTR gene mutation.

**Conclusion.** Cardiac amyloidosis is a rare disease, which is often mimicked by other cardiovascular conditions. As highlighted in this case report, it is often a long and difficult process of extensive testing and various examinations to reach a final diagnosis with different treatment options.

## UNDIAGNOSED CHRONIC MESENTERIC ISCHEMIA IN A PATIENT WITH ATHEROSCLEROSIS: A CASE REPORT

Author: *Reinis Lillais*<sup>1</sup>

Scientific research supervisor: Dr. *Baiba Baķe*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Baiba Baķe's Medical Practice, Latvia*

**Keywords.** Atherosclerosis, Mesenterial ischemia, Intestine necrosis.

**Introduction.** Chronic mesenteric ischemia is a condition in which plaque builds up in the major arteries – including the celiac and superior mesenteric arteries – that supply blood to the small intestine or small bowel. These blood clots in the small intestine and bowels can lead to weight loss and abdominal pain. Untreated, these blockages can cause life threatening condition – bowel or small intestine necrosis.

**Case Description.** A 78-year-old male retiree presents to their GP with chronic abdominal cramp-like pain with sudden onset that cannot be relieved by NSAID's and only subside in foetal position. The pain appeared after a femoral artery PCA performed on the same month. The patient also has history of colon cancer which was successfully treated in 2000. GP refers the patient to a gastroenterologist based on suspicion of a colon cancer recurrence. During a colonoscopy, a biopsy was taken from a found polyp – histology reveals a grade 1 adenocarcinoma. Laparotomy was scheduled and performed to excise the tumour. After the surgery, another exploratory laparotomy was performed 3 days later where the surgeon finds large zones of proximal and distal colon and small intestine necrosis. Despite a successful excision of the necrotic parts of GIT, the outcome is exitus lethalis. Retrospectively, the patient had history of atherosclerotic conditions – both femoral artery PCA's (2019 Jan, 2020 Jan), 50% blockage of a.carotis interna sin. on neck duplex US and 40-60% blockage of carotic arteries during a coronography in 2017.

**Summary.** For patients with chronic cramp-like pain in their abdomen with known atherosclerotic conditions the diagnosis of mesenterial ischemia should always be considered.

**Conclusion.** Despite this patient having a grade 1 adenocarcinoma in their colon, the differential diagnosis of mesenterial ischemia should have been considered based on the patient's atherosclerotic conditions.

## HEART TRANSPLANTATION DUE TO ISCHEMIC CARDIOMYOPATHY: 10-YEAR FOLLOW UP

Authors: *Andrius Montrimas*<sup>1</sup>, *Agnė Česnauskaitė*<sup>1</sup>  
Scientific research supervisor: Dr. *Neringa Česnauskienė*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Vita Longa Clinic, Lithuania*

**Keywords.** Heart transplantation, ischemic cardiomyopathy.

**Introduction.** Heart transplantation (HT) surgery is a gold standard treatment for end-stage heart failure (HF) despite optimal therapy. The most recent international registry reports show that 1-year survival of HT patients is around 84.5% whereas the median of survival after HT among adults is 11 years.

**Case Description.** A 60 year old male patient underwent successful HT in 2011 due to ischemic cardiomyopathy (ICM) and decompensated end-stage HF. The patient's medical history before HT involves an acute massive myocardial infarction with coronary artery bypass graft (CABG) surgery in 2003, another CABG surgery in 2005 and an implantation of electrocardiostimulator in 2010, but the clinical effectiveness of these methods was limited. Since HT, the patient has experienced 4 successfully managed immune graft rejection episodes, bilateral endoprosthetic hip replacement, hemicolectomy and sepsis. Now, 10 years after the HT, the patient has HF (NYHA III), arterial hypertension, stable angina, atrial fibrillation, hyperlipidemia, deep vein thrombosis, chronic kidney disease, diabetes mellitus, COPD but the patient is functionally independent and his heart is functioning without considerable changes. The latest echocardiography shows dilatation of atria and right ventricle within the normal range and slight changes in left ventricular geometric pattern with normal systolic and diastolic function and ejection fraction reaching 50%, when compared to echocardiographic findings 1 year after HT. The dynamic changes in heart MRI confirm aforementioned findings: the volume and the mass of the left ventricle have slightly increased with an insignificant decrease in systolic function.

**Summary.** This case represents structural and functional changes of the heart of a polymorbid HT patient at 10-year follow-up.

**Conclusion.** Correct management of graft rejection episodes and various comorbidities contributes to reaching an aspirable long term survival after HT.



## ATYPICAL COURSE OF AUTOIMMUNE ENCEPHALITIS: A CASE REPORT

Author: *Elīna Līce*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. *Zanda Priede*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Autoimmune encephalitis; PET-CT, brain biopsy.

**Introduction.** Autoimmune encephalitis is an inflammation of the brain parenchyma caused by the dysregulation of immune system. Disease manifests with progressively altered mental status, delirium, focal neurological symptoms.

**Case Description.** 70-year-old male presented to the emergency-room with suspicions of the right facial nerve neuropathy. The patient has a facial droop in the right corner of his mouth. He has developed nasal voice a week before and slight accumulation of saliva.

Neurological examination revealed - saccadic eye movements in both directions, right facial muscle paresis of central type, dysarthria, light ataxia. Vertebrobasilar stroke is suspected.

In the brain MRI vast changes in both forehead lobes are established. Lumbar puncture is negative for bacterial/viral encephalitis and for autoimmune/onconeural antibodies. CTs for lungs and abdominal cavity do not produce any data on oncological processes. To clarify the diagnosis brain biopsy is performed and encephalitis is detected. Therapy is initiated with Methylprednisolone, then changed to Prednisolone. Control brain MRI and neurological examination is performed, negative dynamic is not observed, patient is discharged.

Due to positive Anti-Hu antibodies in serum, outpatient PET-CT is performed showing metabolic changes in the colon and prostate tissue. The patient is re-hospitalized within a month due to rapid negative neurological dynamic - dysarthria, dysphonia, central type facial muscle paresis, moderate paresis in the right arm, increased muscle tone on both sides, clonus in legs, positive Babinski reflex.

Esophagogastroduodenoscopy and colonoscopy with biopsy is performed - pathology is not detected. Patients' clinical condition is deteriorating, therefore IV immunoglobulin and Methylprednisolone are added to the therapy. Nevertheless, positive dynamic is not detected and Cyclophosphamidum is added.

After 13 days the patient has developed a fever, aspiration pneumonia, sepsis, and notwithstanding the antibacterial therapy - exitus letalis.

**Summary.** Autoimmune encephalitis is difficult to diagnose due to wide range of differential diagnosis. The condition is challenging even for experienced professionals.

**Conclusion.** Clinical case demonstrates rapid progression of autoimmune encephalitis despite the complexity of the diagnosis and applied multimodal therapy.

## CARDIORENAL SYNDROME

Author: **Viktorija Verhovceva**<sup>1</sup>

Scientific research supervisor: Dr. **Jūlija Voichevskā**<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Rīga East Clinical University Hospital, Latvia*

**Keywords.** Cardiorenal Syndrome, chronic heart failure, chronic kidney disease.

**Introduction.** The term Cardiorenal syndrome describes a clinical situation of combined dysfunction of the heart and kidneys resulting in a multilevel cascade of mechanisms causing injury of both organs.

**Case Description.** An 88-year-old female patient was transferred from Hospital of Traumatology and Orthopedics, where she underwent amputation of the left first and second toe because of squamous cell carcinoma, to Rīga East Clinical University Hospital. In the postoperative period there was an increase in kidney markers (serum creatinine from 99  $\mu\text{mol/L}$  to 585  $\mu\text{mol/L}$ ), also a decrease of urine volume.

The past medical history included coronary heart disease, a paroxysmal form of atrial fibrillation, primary arterial hypertension (stage 2), chronic heart failure (Class II, NYHA). In 2013, the patient underwent an electro cardiac stimulator implantation because of atrioventricular block. The ultrasound revealed renal parenchymal changes specific for chronic kidney disease. CT scan findings included bilateral hydrothorax and basal pneumonia. Regarding to the results of laboratory and imaging studies, the diagnosis was set: Chronic interstitial nephritis. Acute kidney injury with pre-existing chronic kidney disease (stage 3).

A treatment plan included antibacterial, diuretic, beta-blocking, anti-arrhythmic medications and intermittent hemodialysis every second day.

The patient was discharged 7 days later with improved renal markers - serum creatinine from 705.88  $\mu\text{mol/L}$  to 499.00  $\mu\text{mol/L}$  and C-reactive protein from 142.3 mg/L to 26.4 mg/L. In 3 months, renal functions partially recovered (serum creatinine 130  $\mu\text{mol/L}$ ), intermittent hemodialysis stopped, central venous catheter removed.

**Summary.** The case report represents one of the 5 cardiorenal syndrome types, the etiology of which is based on chronic heart failure leading to chronic kidney disease with acute decompensation.

**Conclusion.** Cardiorenal syndrome presents with high level of impact on clinical outcome and mortality, consequently understanding of the pathophysiology provides help in risk stratification, early diagnosing and successful therapy planning.

## METASTATIC GASTRIC CANCER MIMICKING PULMONARY SARCOIDOSIS

Authors: *Viktorija Kenstavičiūtė*<sup>1</sup>, *Rūta Pačinskaitė*<sup>1</sup>

Scientific research supervisors: Dr. *Laima Kondratavičienė*<sup>2</sup>,  
Dr. *Gertrūda Maziliauskienė*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup>*Hospital of Lithuanian University of Health Sciences Kauno klinikos, Lithuania*

**Keywords.** Gastric adenocarcinoma, pulmonary metastases, sarcoidosis.

**Introduction.** Stomach cancer is the fifth most common oncological disease in the world and poses a diagnostic difficulty due to its often asymptomatic course. Usually, the first clinical signs are associated with lesions of abundant metastasis in the liver, peritoneum, and lungs. In rare cases, pulmonary metastases may resemble granulomatous disease, such as sarcoidosis.

**Case Description.** In September of 2020 a 30-year-old man with a 2-month history of dyspnea, wheezing, and pain in the chest was admitted to the hospital. There were no gastrointestinal complaints nor abnormal findings in the physical examination. Initial chest radiograph showed pulmonary infiltrates, predominantly in upper and middle lobes bilaterally – 3rd stage sarcoidosis was suspected. Subsequent chest computer tomography (CT) exhibited additional findings: lymphostasis, hilar and mediastinal lymphadenopathy, interlobular septal thickening, and diffuse perilymphatic nodules, and supported the primary hypothesis. However, surprisingly, endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) revealed adenocarcinoma with a signet-ring morphology, and the spread of oncoprocess from the gastrointestinal tract was suspected. Chest, abdomen, and pelvic CT exhibited additional findings of ascites, multiple liver, and peritoneal metastases, and highlighted the primary focus of the tumor - gastric cardiac carcinoma. Finally, esophagogastroduodenoscopy with biopsy was performed and confirmed an infiltrative tumor of the gastric body.

**Summary.** Stomach cancer is a common oncological disease. In rare cases, its pulmonary metastases may resemble granulomatous disease, such as sarcoidosis. This report demonstrates a case of a 30-year-old male with an atypical radiological appearance of pulmonary metastases from gastric adenocarcinoma.

**Conclusion.** While lung metastases typically appear as well-defined, rounded lesions, the presence of diffuse infiltrates which resemble granulomas and indicate sarcoidosis is also possible. Our aim is to remind clinicians to be aware of metastatic spread in the differential diagnosis of sarcoidosis.

## PULMONARY EMBOLISM IN PATIENT WITH COLORECTAL CANCER AND COVID-19 PNEUMONIA: A CASE REPORT

Authors: *Laura Rudoviča*<sup>1</sup>, *Krista Cēbere*<sup>1</sup>, *Anastasija Zaičenko*<sup>1</sup>,  
*Elīna Rūsa*<sup>1</sup>, *Jānis Birzulis*<sup>1</sup>

Scientific research supervisors: Assist. Prof. *Andris Skride*<sup>1</sup>, Dr. *Dana Kigitoviča*<sup>1</sup>,  
Dr. *Valdis Ģibietis*<sup>1</sup>, Dr. *Sintija Strautmane*<sup>1</sup>, Dr. *Kristīne Maķe*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Colorectal cancer, chemotherapy, Covid-19 pneumonia, pulmonary embolism.

**Introduction.** Coronavirus disease 2019 (Covid-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is associated with the development of a pro-coagulative state among affected individuals, including life-threatening pulmonary embolism (PE).

**Case Description.** A 78-year-old patient 3 days after chemotherapy due to colorectal cancer (T<sub>3</sub>N<sub>2</sub>M<sub>0</sub>) was admitted to the hospital. The main complaints included general fatigue, fever (39°C), nausea that did not subside after paracetamol. At the emergency department, the patient tested positive for SARS-CoV-2 infection. Lung CT scan was performed revealing no signs of pneumonia. The patient denied any other clinical symptoms. The patient received antihypertensive therapy and prophylactic doses of Nadroparin. During her in-hospital stay, the patient deteriorated as she needed additional oxygen therapy with a non-rebreather mask. CT pulmonary angiography was performed demonstrating acute bilateral pneumonia – a characteristic presentation for Covid-19 – and multiple thrombi in right pulmonary arteries demonstrating pulmonary embolism (PE). Nadroparin therapy at a therapeutic dose was initiated, therapy with dexamethasone was added. Further recovery occurred without complications. The patient was discharged with no supplemental oxygen requirement after 25 days of in-hospital stay.

**Summary.** A case of 78-year-old patient with anamnesis of oncology and main complaints of general fatigue who tested positive for SARS-Cov-2 infection was demonstrated. Gradually, the patient developed Covid-19 pneumonia and PE in the right pulmonary arteries. Nadroparin in therapeutic dose and therapy with dexamethasone was initiated. After 25 days of in-hospital stay, the patient was discharged in a good overall health condition. LMWH therapy is necessary and viable in all patients with suspected or confirmed Covid-19 due to its procoagulant effect resulting in successful patient recovery.

**Conclusion.** Covid-19 disease is associated with significant procoagulant effects, therefore thromboprophylaxis with low molecular weight heparin should be initiated in all patients with suspected or confirmed Covid-19 admitted to the hospital.

## THE CHALLENGING DIAGNOSIS PROCESS OF LEUKOCYTOCLASTIC VASCULITIS

Authors: *Elīna Auziņa*<sup>1</sup>, *Una Birziņa*<sup>1</sup>

Scientific research supervisor: Dr. *Ilze Upeniece*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga 1st Hospital, Latvia*

**Keywords.** Vascular reaction, palpable pupura, small blood vessels vasculitis, edema of the calves.

**Introduction.** Leukocytoclastic vasculitis is the most common form of vasculitis that is caused by circulating immune complexes that may be caused by a number of underlying disorders. The effect of this condition can appear not only on the body, but also develop further and can be associated with systemic manifestations involving joints, kidneys and gastrointestinal system. Vasculitis can be caused by idiopathic infections, medication, hematological and other malignancies. Characteristics of leukocytoclastic vasculitis are palpable purpura, urticarial and bullous lesions. The area that is affected the most is calves, but there can be lesions all over the body. Diagnosis of vasculitis is time consuming, therefore, it is important to understand the cause.

This case illustrates a successful FDCS diagnostics and multidisciplinary treatment.

**Case Description.** The patient is a 82-year-old male from Latvia. He has been experiencing symptoms of the disease since 2018. He has been complaining about rash on extremities, that are constant and do not progress. Clinically, the patient has hyperpigmentation, hemorrhagic bullae, blisters and pronounced venular pattern on both calves. The patient has typical clinical signs of leukocytoclastic vasculitis without defined etiology. The patient was signed for further examinations, even it was not informative previously.

**Summary.** Leukocytoclastic vasculitis represents a vascular reaction. The key goal is to find the cause of the vasculitis.

**Conclusion.** The diagnosis determines the choice of therapy. As the patient currently has idiopathic vasculitis, therapy can be difficult because the therapy does not have a particular goal.

## DARIER-WHITE DISEASE

Authors: *Una Birziņa*<sup>1</sup>, *Elīna Auziņa*<sup>1</sup>

Scientific research supervisor: Dr. *Ilze Upeniece*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga 1st Hospital, Latvia*

**Keywords.** Autosomal dominant disease, ATP2A2 gene, keratosis follicularis, keratotic papules.

**Introduction.** Darier disease is a rare, hereditary disorder, transmitted in an autosomal dominant pattern. Mutations in ATP2A2 gene are caused by keratosis follicularis. The first manifestations usually appear between the ages of 6 and 20 and can develop in infants and elderly people.

The characteristics of this disease are multiple, skin-colored or yellow-brown, hyperkeratotic papules, predominantly in seborrheic areas that appear on the face, head, neck and rear. The histologic features of Darier disease depend on a variable interplay between acantholysis and abnormal keratinization (dyskeratosis).

This case illustrates a successful FDCS diagnostics and multidisciplinary treatment.

**Case Description.** The patient is a 71-year-old male has experienced symptoms of the disease since the age of 8, but the illness started progressing from the age of 17. Regular check-ups were performed and therapy – used, as recommended. The acitretin therapy, assigned to the patient since 2017, caused irritability and aggression, therefore, the therapy was cancelled. Adequate systemic therapy for the patient is limited, therefore, local therapy is used. The patient's disease is progressing further. In the beginning of 2021, the patient was hospitalized in Rīga 1st Hospital due to the onset of a secondary infection. The patient complained of periodic itching. He has diffused symmetrically grouped rounds. Erythematous papules were found (sandpaper surface with yellow-brown scabs). During examination pathological bacterial flora was often found.

**Summary.** Follicular dyskeratosis is a rare genetic disease that has a variable clinical course. In Darier disease spontaneous remissions are rare. Most of the patients suffer from the disease their whole life.

**Conclusion.** Patients with Darier disease are exposed to infections that show resistance to antibiotic therapy.

## LONG TERM APOMORPHINE TREATMENT IN PARKINSON'S DISEASE PATIENT: A CASE REPORT OF OVER TWO DECADES

Author: *Daniils Žukovs*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. Dr. med. *Maja Trošt*<sup>2,3</sup>,  
*Dr. Maruša Mencinger*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Clinical Department of Nervous System Diseases, Department of Neurology, University Medical Center, Slovenia*

<sup>3</sup> *University of Ljubljana, Slovenia*

**Keywords.** Advanced Parkinson's disease, continuous dopaminergic stimulation, subcutaneous apomorphine infusion.

**Introduction.** Treatment with subcutaneous apomorphine is one of three effective continuous ways to treat advanced Parkinson's disease patients, who develop marked motor fluctuations and/or dyskinesia, which are not manageable with oral medications.

**Case Description.** A 74-years-old female was admitted to the hospital for follow-up regarding advanced Parkinson's disease. The diagnosis was made at the age of 37 with main complaints of less legible handwriting, movement slowness, and clumsiness. She started oral antiparkinsonian therapy alone for 7 years; due to severe "off" periods treatment with intermittent apomorphine injections was introduced. 6 years later a continuous subcutaneous infusion of apomorphine was introduced, and the dose of levodopa was much reduced. After 14 years of apomorphine continuous infusion, she developed visible hallucinations, which resolved after the introduction of low doses of quetiapine. She has never developed symptoms of dopamine dysregulation syndrome during apomorphine treatment, nor had any skin problems. At the last check-up in June 2020, 23 years of apomorphine pump, the patient had no rigidity and tremor on examination, bradykinesia was moderate. She is currently receiving continuous apomorphine infusion from 9 a.m. to 8.30 p.m. per day and needs 5 boluses of apomorphine daily. Levodopa dosage is less than before the introduction of apomorphine. She is also treated with paroxetine, quetiapine, and rivastigmine patch.

**Summary.** A case of the patient with early-onset Parkinson's disease on the decades-long and well-tolerated apomorphine subcutaneous infusion treatment.

**Conclusion.** Apomorphine subcutaneous infusion is a successful continuous treatment for advanced PD patients which is safe over the long-term. However, due to apomorphine-related complications and/or worsening of motor fluctuations/dyskinesia, patients may need a change of a continuous treatment strategy. The described patient demonstrated well tolerated and long-term apomorphine infusion treatment with little complications for over two decades.

## SUCCESSFULLY MANAGED FOLLICULAR DENDRITIC CELL SARCOMA: A CASE REPORT

Author: *Valerija Grakova*<sup>1</sup>

Scientific research supervisor: Dr. *Elza Grinčuka*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Daugavpils Regional Hospital, Latvia*

**Keywords.** Rare tumor, follicular dendritic cell sarcoma, multidisciplinary treatment.

**Introduction.** Follicular dendritic cell sarcoma (FDCS) is a rare low-malignant potential neoplasm, that occurs mainly in lymph nodes. It was first described in 1986, with no more than thousand cases reported worldwide.

This case illustrates a successful FDCS diagnostics and multidisciplinary treatment.

**Case Description.** A 36-year-old man with no previous disease history presented with hyperhidrosis, dizziness, nausea, abdominal discomfort, and low back pain. The CT scan as well as MRI revealed multiple enlarged lymph nodes in porta hepatis, pancreatoduodenal zone, para-aortic, paracaval regions, including lateral external iliac lymph nodes of about 58 mm in maximum diameter. The patient underwent a gross total resection. Histopathologic evaluation (spindle cell proliferation with storiform trabecular sheets, small lymphocytes) and immunohistochemistry (CD21+, CD35+) of removed specimen confirmed the diagnosis of a FDCS. After resection, the patient followed up with hematology-oncology, which led to adjuvant chemotherapy. The first line chemotherapy was performed: 7 cycles of CHOP: cyclophosphamide, liposomal doxorubicin, vincristine, and prednisone. A repeat CT scan 7 months afterward revealed meager pathological tissue in porta hepatis and pancreatoduodenal zone, and no more along magistral blood vessels. It is 11 years of stable remission with no relapse for now.

**Summary.** Patient with diagnosed FDCS underwent radical surgical resection and postoperative adjuvant chemotherapy. Remission was achieved with no relapse. While statistics show that a median posttreatment recurrence-free survival is 2.9 years, and a five-year recurrence-free survival rate varies from low risk - 34% to high - 73%; mortality rate is 3-28%, respectively.

**Conclusion.** Over the last few years, dendritic cell tumors have been increasingly recognized by pathologists. Nevertheless, owing to the rareness of FDCS, guideline-based treatment is not well defined. This case is in support of growing evidence suggesting that FDCS responds to systemic therapies that are used for soft tissue sarcoma.



## POST-TRAUMATIC ANOSMIA SECONDARY TO HEAD INJURY

Authors: *Aija Tumova*<sup>1</sup>, *Edgars Ķiecis*<sup>1</sup>

Scientific research supervisor: Dr. *Aigars Ķiecis*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Latvia*

**Keywords.** Post-traumatic anosmia, scent, head trauma, olfactory dysfunction.

**Introduction.** Head trauma is a common cause of anosmia. However, the diagnosis is often late due to greater attention being paid to the more life-threatening sequelae of the injury. About 30% of all head traumas result in olfactory dysfunction.

**Case Description.** While on a vacation in Austria, a 44-year-old woman got into a traffic accident and was admitted to the hospital with complaints of progressive headache. Investigation with multisection computed tomography (CT) scan revealed nothing of importance. Therefore, the patient received medical treatment and was discharged from the hospital three days later.

After a couple of months, the patient noticed that she had lost the sense of smell, which included not being able to smell jasmine, coffee, cinnamon, cloves and peppermint. Consequently, brain magnetic resonance imaging (MRI) was performed. Abnormal intensity due to cerebral contusion bilaterally in the orbitofrontal cortex was detected, mainly demonstrating abnormalities in the olfactory bulbs, olfactory tract and the inferior frontal lobes. The patient was referred to an otorhinolaryngologist and medical treatment was initiated.

Even though her sense of smell has improved, the patient still cannot recognise the majority of scents and has to take ten drugs daily.

**Summary.** A 44-year-old woman got into a traffic accident and suffered a head trauma. During the following months the patient developed loss of smell. The MRI scan revealed abnormalities in the olfactory bulbs and the olfactory tract.

**Conclusion.** This case report highlights that a head trauma can easily result in olfactory dysfunction. Conventional MRI should be performed both at the time of the injury and during follow-up, particularly in patients with frontal lesions. Pathological findings may alert the clinician to the possibility of olfactory dysfunction, thus allowing for early consultation with an otorhinolaryngologist and early use of objective smell testing.

# SURGERY

## TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE CORRECTION OF NEWBORN – IT'S POSITIVE RESULTS AND UNEXPECTED TURN: A RARE CASE REPORT

Author: *Jūlija Žmarjova*<sup>1</sup>

Scientific research supervisor: Dr. *Lauris Šmits*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Department of Pediatric Cardiology and Cardiac Surgery, Latvia*

**Keywords.** TAPVD, newborn, hypoxia, Rashkind, stenting, n.phrenicus.

**Introduction.** Total anomalous pulmonary venous drainage (TAPVD) is a rare congenital heart disease (CHD) where all pulmonary veins, which can be obstructed, drain to systemic veins, right atrium, or coronary sinus circulation in 4 types- supracardiac/cardiac/infracardiac/mixed.

Pulmonary/systemic venous blood mix in the right atrium causing volume overload of right atrium/ventricle, depression of left ventricle, decrease of central circulation.

Many patients require urgent cardiac surgery that has post-operative risk of complications (pulmonary edema/hypertensive crisis/n.phrenicus damage).

**Case Description.** A newborn born with persistent hypoxia (SpO<sub>2</sub> 65-79%)/cyanosis. USG during pregnancy showed no cardiac pathology therefore intrauterine pneumonia was suspected firstly. On the next day, echocardiography showed supracardiac TAPVD with pulmonary venous collector (PVC) stenosis; patient was admitted to Children's Clinical University Hospital. Rashkind procedure was made to improve blood flow to the left atrium. SpO<sub>2</sub> decreased (18-40%) therefore followed invasive stent implantation in PVC, SpO<sub>2</sub> increased (85%). Soon acute bacterial airway infection was diagnosed. Successful TAPVD correction was done after 2 weeks (infection was cured) including median sternotomy, formation of "side-by-side" anastomosis between left atrium/PVC, d.Botalli/v.verticalis ligation, left atrium augmentation. Nevertheless, echocardiography showed diaphragmatic right cupola paroxysmal excursions indicating n.phrenicus damage. Consilium decided to treat patient with medicine/physiotherapy/breathing exercises/C-PAP ventilation. Now, patient breathes without C-PAP for 6-8 hours, cardiovascular/pulmonary function is well, diaphragmatic excursions are improved. Echocardiography shows anatomically normal heart without gradient in anastomosis site.

**Summary.** TAPVD is a rare, various CHD, which severity depends on its type and obstruction of pulmonary veins and requires rapid investigation and right diagnosis for further decision making because many patients need urgent cardiac surgery that, unfortunately, has a significant post-operative risk of complications.

**Conclusion.** Regardless of medical staff's operative group work towards patient's well-being, unexpected turns can follow positive results. However, the same group work and competence can reverse them forwards near-normal patient's life.

## PARAPHARYNGEAL ABSCESS OCCURRED AFTER TEMPORAL BONE FRACTURE

Author: *Jurgita Jursaitė*<sup>1</sup>

Scientific research supervisor: Dr. med. *Irina Arechvo*<sup>2</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Republican Vilnius University Hospital, Lithuania*

**Keywords.** Parapharyngeal abscess; cholesteatoma; peritubal route; temporal bone fracture.

**Introduction.** Parapharyngeal abscess as a cervical complication of the cholesteatoma is an extremely rare disease. Different routes of extension, e.g. peritubal, through the eroded mastoid tip, or due to the apex involvement of the petrous temporal bone, have been previously described. However, the appropriate time and surgical strategies for management of the complications and principal disease are still controversial.

**Case Description.** A 65-year-old man with a long history of recurrent right purulent otorrhea presented with right temporal bone fracture. Later, he started to complain of hoarseness, snoring and dysphagia and was diagnosed with right parapharyngeal abscess based on a contrast enhanced computed tomography scan. The patient underwent abscess drainage through transcervical route with simultaneous emergency radical mastoidectomy. Despite development of septic shock, with acute renal failure in the postoperative period, the patient recovered.

**Summary.** Parapharyngeal abscess as a cervical complication of the cholesteatoma is an extremely rare disease. Appropriate time and surgical strategies for management of the complication and principal disease are still controversial. A case is presented about 65-year-old man with right temporal bone fracture and symptoms of hoarseness, snoring and dysphagia. Right parapharyngeal abscess was diagnosed. The patient underwent abscess drainage through transcervical route with simultaneous emergency radical mastoidectomy.

**Conclusion.** Temporal bone fracture in patients with preexisting chronic otitis media with cholesteatoma can cause infection extension to the deep neck spaces through the fracture bone defects. Early consultation with an otologist is indicated in such cases. Analysis of the computed tomography scans with thorough evaluation of the fracture line extension should be performed to prevent the complications.

## RARE CASE OF ACUTE ABDOMEN – LAPAROSCOPIC MANAGEMENT OF GIANT COLONIC DIVERTICULUM WITH COEXISTING BOWEL ENDOMETRIOSIS

Author: *Aleksandra Gromova*<sup>1</sup>

Scientific research supervisor: Dr. *Vjačeslavs Popkovs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Jurmala Hospital, Latvia*

**Keywords.** Giant colonic diverticulum, laparoscopy, bowel endometriosis, mini-invasive technique, acute abdomen.

**Introduction.** Giant colonic diverticulum refers to diverticula that are greater than 4cm in diameter. Aim of the demonstration is to show the mini-invasive technique when treating relatively uncommon clinical manifestation of diverticular disease.

**Case Description.** A 57-year-old female was admitted to the Emergency Department complaining about severe hypogastric pain. Patient mentioned hysterectomy due to uterine fibroid and multiple bilateral ovarian cysts in 2013. Clinical examination revealed palpable painful abdominal mass in central hypogastric region with no signs of peritonitis. CT scan verified 15×10cm air filled structure, closely to sigmoid colon, without communication to it. Conservative treatment with no positive dynamic and gradually increasing signs of local peritonitis suggested clear indications for urgent surgery. Exploratory laparoscopy revealed cystic mass 15\*10cm in size, located intraperitoneally in lower part of the abdomen, adhered to sigmoid colon together with local fluid collection and fibrin. During careful mobilization of the structure, the lesion collapsed without any other fluid leakage. After complete enucleation, control air test revealed 0,5cm rupture of sigmoid colon and it was closed with 2 layers of hand-sew suture. Control air retest was negative. Postoperative period was uneventful. Histological examination revealed that the specimen wall is made of intestinal and endometrial tissue at the same time.

**Summary.** According to a systematic review through 2015, only 166 cases described in literature and no cases with coexisting endometriosis. The etiology of this condition, taking in mind patient's history encourages wide discussion.

**Conclusion.** Laparoscopic approach allowed to perform additional exploration without radical incision and lack of signs of communication allowed cyst enucleation instead of radical Hartmann's left colectomy which is usually performed in complicated GCD. Air test was extremely important in detecting colonic rupture, but the cause of it is debatable.

## TREATMENT FOR RECTOVAGINAL FISTULA BY MARTIUS FLAP SURGERY. A CASE REPORT

Author: *Hilda Darta Snipe*<sup>1</sup>

Scientific research supervisors: Dr. *Justīne Brūvere-Kaupe*<sup>2</sup>, Dr. *Kaspars Snipe*<sup>3</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

<sup>3</sup> *Rīga 1st hospital, Latvia*

**Keywords.** Rectovaginal fistula, martius flap.

**Introduction.** Rectovaginal fistula (RF) is a condition that has negative impact on quality of everyday life. RF is a rare condition mostly associated with Inflammatory bowel diseases - Crohn disease, ulcerative colitis. Childbirth, malignancies, operative trauma, infectious processes may also be the cause of RF.

RF are challenging for surgeons. The recurrence rate is a little bit above 60%. Martius flap is a way to treat such condition. By Martius flap procedure (MFP) the bulbocavernosus muscle and tissue from labia majora region is used to recover the rectovaginal septum. MFP is underestimated treatment in Latvia which significantly improves the quality of life.

**Case Description.** We report the case of a 37-year-old woman who presented to the proctologist with complaints of passing flatus and stool from the vagina. Complaints progressed before the second unplanned pregnancy. The rectovaginal fistula was found by physical examination. Surgical treatment after the childbirth was recommended by general surgeon and gynaecologist. The rectoscopy and transrectal ultrasonography (3DTRUS) was performed to confirm the diagnose prior elective surgery. Fistula in rectovaginal septum was folded, measuring 1,5cm in length and 0,6cm in diameter. It connected anal canal and vagina. The fistula had transsphincteric localisation. Martius flap technic which is fistula repairing method with healthy vascularised tissue in rectovaginal septum was applied for the treatment under general anaesthesia. The surgical site wound healed primarily. Perioperative antibiotics therapy was administrated. The surgery as well as the postoperative course was uneventful. Early follow up revealed that the treatment was successful.

**Summary.** A 37-year-old female patient with complains of passing flatus and stool from the vagina was diagnosed with rectovaginal fistula by physical and visual diagnostic methods. The fistula was treated successfully with MFP.

**Conclusion.** Martius flap procedure is an effective treatment of rectovaginal fistula. In this case the cause for RF might be childbirth.

## NEUROENDOCRINE NEOPLASM MIMICKING PSYCHIATRIC DISORDER

Author: *Iveta Eihmane-Strusele*<sup>1</sup>

Scientific research supervisors: Dr. *Rita Niciporuka*<sup>2,3</sup>, Prof. *Janis Gardovskis*<sup>2,3</sup>,  
Asoc. Prof. *Zenons Narbutis*<sup>2,3</sup>, Dr. *Natalija Kapla*<sup>4</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Stradiņš University, Department of Surgery, Latvia*

<sup>3</sup> *Pauls Stradiņš Clinical University Hospital, Department of Surgery, Endocrine surgery Unit, Latvia*

<sup>4</sup> *Pauls Stradiņš Clinical University Hospital, Department of Endocrinology, Latvia*

**Keywords.** Hypoglycemia, pancreas neuroendocrine neoplasms.

**Introduction.** Most frequently neuroendocrine neoplasms (NENs) occur in the digestive system followed by the lungs. NENs of pancreas (PNENs) account for approximately 30% of all gastro-entero-pancreatic neoplasms. PNENs can be hormonally active, causing a large variety of clinical symptoms.

**Case Description.** Female (66 years) with progressive hand tremor, increased perspiration, weakness, palpitations, episodes of confusion and loss of consciousness. Symptoms become more common and unpredictable throughout the year. Due to clinical presentation, psychiatric condition was suspected and treatment with antidepressants and antipsychotics medications was prescribed. Despite the treatment, symptoms became more frequent and got accompanied by abnormal behaviors.

During one of episodes, hypoglycemia (0,57 mmol/l) was noticed. For differentiation of hypoglycemia reasons, patient underwent chest CT. Pathological mass (1,9 cm) in left lung was, suspected NENs, was found. Video-assisted tumor extirpation from thoracic cavity was performed. Morphology revealed pleomorphic adenoma.

After operation symptomatic hypoglycemia persisted. Because of suspected NENs, Chromogranin A was assessed and noticed elevated -101,7 µg/l (reference range <100 µg/l). Further in somatostatin receptor scintigraphy intensive isotope accumulation in pancreas was visualised. In MRI - 1,2 cm large mass in pancreas body was recognised.

Fine needle aspiration revealed high differentiate NETs. Laparoscopic enucleation of tumor was performed. Morphology revealed PNENs pT1NxMoG1Ro. After surgery hypoglycemia episodes or previous clinical symptoms were not observed.

**Summary.** Patient with misdiagnosed PNENs did not receive appropriate treatment for two years because PNENs symptoms were mimicking mental disorder. After diagnosis was established and accurate medicamentous and surgical treatment done and patient's full recovery was achieved.

**Conclusion.** PNENs can manifest with different psychiatric and somatic symptoms, mimicking mental disorders. Due to initial misdiagnosis patients may not receive adequate treatment. This case underlines the need of awareness of different clinical manifestations of PNENs.

## ONE-STEP LOWER LEG RECONSTRUCTION WITH VASCULARIZED FUNCTIONAL VASTUS LATERALIS MUSCLE FLAP IN THE TREATMENT OF EMBRYONAL RHABDOMYOSARCOMA FOR A SIX-MONTH-OLD BOY

Author: *Linda Kalniņa*<sup>1</sup>

Scientific research supervisors: Dr. *Dzintars Ozols*<sup>2</sup>, Dr. *Marisa Maija Berezovska*<sup>2</sup>,  
Dr. *Marika Grutupa*<sup>3</sup>, Prof. *Aigars Pētersons*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Department of Paediatric Surgery, Latvia*

<sup>3</sup> *Children's Clinical University Hospital, Department of Hematooncology, Latvia*

**Keywords.** Embryonal rhabdomyosarcoma; functional vastus transplantation; infant microsurgery.

**Introduction.** Rhabdomyosarcoma (RMS) is a common soft tissue sarcoma in childhood, however, it is very rare in the neonatal period (0.4–2% of cases). Surgery remains the standard of treatment, yet the curative aim cannot be achieved without adjuvant treatment. Reconstructive possibilities are limited in the pediatric population younger than two years of age due to relatively small structures such as blood vessels.

**Case Description.** This case depicts a boy, who presented with RMS at two weeks of age but officially diagnosed at the age of three months. MRI and scintigraphy determined a soft tissue tumor in the soleus muscle, while biopsy confirmed embryonal RMS with high mitotic activity (Ki67 (monoclonal antibodies) ~80%). CWS (Cooperative Weichteilsarkom Studiengruppe)-2012 with I2VA (ifosfamide, vincristine, actinomycin) chemotherapy regimen was administered per protocol. Surgical treatment was performed at age of 6 months and 18 days. The operation consisted of radical tumor resection and total triceps surae with partial fibula resection. Immediate reconstruction of triceps muscle was accomplished using a vascularized functional musculocutaneous vastus lateralis flap. Functional outcome was measured using the Lower Extremity Functional Scale (LEFS) and the Foot and Ankle Outcome Score (FAOS) with the results of 92.5% and 99% respectively.

**Summary.** This case demonstrates complex treatment of the embryonal RMS with one-step surgical reconstruction with functional vastus lateralis myocutaneous microvascular flap for the youngest patient in Latvia. Small vessel size is challenging for microvascular anastomosis at the infant age but refined surgical skills and excellent magnification can lead to successful surgical outcomes.

**Conclusion.** Embryonal rhabdomyosarcoma is a rare congenital tumor with a good prognostic outcome. Successful treatment is provided with maximal functional restoration using microvascular tissue transplantation techniques in the infant period. Radical resection of the tumor is recommended and functional reconstruction using microvascular flaps for pediatric patients younger than one year of age.

## FUNCTIONAL RECONSTRUCTION OF TEMPOROMANDIBULAR JOINT AND MANDIBULA AFTER KERATOCYSTIC ODONTOGENIC TUMOR RESECTION

Author: *Pavels Srebnis*<sup>1</sup>

Scientific research supervisors: Dr. *Kristaps Blūms*<sup>2</sup>, Dr. *Vadims Neffodovs*<sup>2</sup>,  
Dr. med. *Kalvis Pastars*<sup>2</sup>, Dr. *Renārs Deksnis*<sup>3</sup>, Dr. *Atis Svare*<sup>3</sup>, *Santa Salaka*<sup>4</sup>,  
Dr. med. *Jānis Zariņš*<sup>1,2</sup>

<sup>1</sup> *University of Latvia, Latvia*

<sup>2</sup> *Rīga Eastern Clinical University Hospital, Microsurgery Centre of Latvia, Latvia*

<sup>3</sup> *Rīga Eastern Clinical University Hospital, Oncology Centre of Latvia, Latvia*

<sup>4</sup> *Rīga Eastern Clinical University Hospital, Department of Rehabilitation, Latvia*

**Keywords.** Temporomandibular joint and mandibula reconstruction, keratocystic odontogenic tumor, chimeric flap, free fibula flap, free femur lateral condyle flap.

**Introduction.** Surgical management of mandibular interosseous tumors is challenging. Surgical steps should include tumor resection, lymphadenectomy, and functional reconstruction of lost anatomical structures. Biomechanical characteristics of the joint, condition of the surrounding tissue, properties of donor tissue and aesthetic factors should be taken into consideration for the best surgical and functional outcome.

**Case Description.** In our case, 43 years old male patient presented with mass in his right chick region. CT scan and MRI showed right side mandibular destruction, ameloblastoma or keratocystic neoplasm was suspected. We have decided to perform one-stage resection of the tumor with reconstruction of the affected structures. Preoperative 3D individual planning was done – affected part of mandible was made de novo using contralateral healthy site to reconstruct proper anatomical location of mandible condyle for TMJ. During the 9.5-hour surgery tracheostomy, lymphadenectomy, resection of mandibula and reconstruction with chimeric free fibula flap and free femur lateral condyle flap was accomplished. All wounds healed uneventfully, and patient started early rehabilitation with full range of motion possible after two weeks. On day 7 postoperatively patient was breathing freely and day 10 postoperatively was able to eat independently.

**Summary.** One-stage functional reconstruction of the mandibula and temporomandibular joint was performed after resection of keratocystic odontogenic tumor. Chimeric free fibula flap and free femur lateral condyle flap were used. Donor site morbidity is insignificant and after only two weeks postoperatively, full range of motion of mandibula is achieved.

**Conclusion.** One-stage functional reconstruction of the mandibula and temporomandibular joint is highly efficient method with promising potential and early recovering that could be implemented in routine for mandibular interosseous tumor management.



## DEBRIDEMENT AND SKIN GRAFTING IN PATIENT WITH NECROTISING FASCIITIS WITH SHOCK AND ATHEROSCLEROSIS

Author: *Artjoms Novickis*<sup>1</sup>

Scientific research supervisors: Dr. *Michael Schintler*<sup>2</sup>, Dr. *Anna Vasilyeva*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Graz University Hospital, Department of Plastic, Aesthetic and Reconstructive Surgery, Austria*

**Keywords.** Necrotizing fasciitis, atherosclerosis, shock, Meek skin grafting.

**Introduction.** Necrotizing fasciitis is a common condition with high mortality rate even with treatment and requires quick treatment initiation. These facts make extensive debridement or even amputation more preferable, which is especially true in patients with diabetes, vascular insufficiency and signs of shock at the time of presentation.

**Case Description.** A 79-year-old patient with history of arterial hypertension, severe atherosclerosis, hyperlipidemia and diabetes mellitus was admitted to University Hospital Graz. On admission, he had hematoma-like lesion with central ulceration on right lower leg, redness, pains and bilateral swelling. Objective examination revealed signs of shock. Further CT excluded thrombotic or ischemic lesion.

The diagnosis of necrotizing fasciitis was set and further confirmed intraoperatively and with culturing. During “first-look” operation, it was found, that infection extends from foot until upper leg medially and posteriorly. Visible necrotic tissue was removed, and broad antibiotic therapy was started. During “second-look” operation on the next day, more of necrotic tissue was removed, but signs of inflammation did not improve. During the “third-look” operation 4 days later, remaining parts of necrotic tissue were removed together with tendons of m. extensor digitorum longus II and III. Vacuum-assisted closure device was used with antimicrobial sponges. 5 days later, skin-graft transplantation from left lower leg was performed using Meek graft dermatome with mesh ratio 1:4. No significant complications were observed after initiation of improvement.

**Summary.** A 79-year-old patient with vascular insufficiency and of shock at time of presentation was diagnosed with necrotizing fasciitis. Several debridement operations were performed with subsequent skin grafting. No complications were observed.

**Conclusion.** Although the condition is connected with high mortality, it is not always necessary to perform amputation in patients with necrotizing fasciitis. With preserved leg patient's further quality of life can be significantly better.

## SILENT OSTEOLYSIS IN TOTAL HIP ARTHROPLASTY

Author: *Uģis Mihelsons*<sup>1</sup>

Scientific research supervisors: Asoc. Prof. *Pēteris Studers*<sup>1</sup>, Dr. *Justs Sauka*<sup>1</sup>,  
Dr. *Una Bladiko*<sup>1</sup>, Dr. *Matīss Zolmanis*<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Hospital of Traumatology and Orthopedics, Latvia*

**Keywords.** Arthroplasty, revision, osteolysis.

**Introduction.** Osteolysis is a pathological process of bone resorption, caused by the body's response to particulate debris generated as the total hip arthroplasty (THA) implant wears out. Motion between any two components of the prosthesis is generating debris that floats around the joint. Osteolysis is typically progressive, and it is often asymptomatic until catastrophic failure, which occurs as sudden loosening of the implant or an acute periprosthetic implant fracture. The decision whether to reoperate the hip joint depends on symptoms (pain), the progression of osteolysis and location, type of implants, patients' activity, and age of the implant.

**Case Description.** Male, 76 y.o., left hip osteoarthritis, underwent THA in 2002. 18 years later patient had progressive pain in the right hip, operated side was symptom free. X-rays showed sclerotic lines around acetabular component, osteolysis and loosening.

Female, 61 y.o., bilateral hip dysplasia, underwent bilateral staged THA (right side- year 1994, left side- year 2012). 26 years since the surgery, the patient had a complaint of progressing pain over the past year. X-ray showed pronounced polyethylene insert wear and cystic changes in the acetabulum superior part. Patient underwent revision surgery-all components were changed to cementless components. During the surgery histological material was retrieved-chronic synovitis and metallosis.

**Summary.** The purpose of this topic is to represent the seriousness of osteolysis caused by particulate debris in THR surgery with clinical cases.

**Conclusion.** As osteolysis silently progresses to increase risks for periprosthetic fracture it is important to acknowledge this matter and it requires orthopaedic knowledge and experience. Patients must be monitored with serial radiographs for progressive changes every 3 to 6 months.

Signs of large lytic lesions, significant progression or loose implants are indications for revision surgery even in the absence of symptoms.

## PERCUTANEOUS NEPHROLITHOTOMY OF BILATERAL STAGHORN CALCULI AND HYDRONEPHROSIS

Author: *Aleksandrs Dorogojs*<sup>1</sup>

Scientific research supervisors: Dr. *Arvis Freimanis*<sup>1,2</sup>, Assoc. Prof. *Vilnis Lietuvietis*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Staghorn calculi, PCNL, nephrolithiasis, hyperparathyroidism.

**Introduction.** Staghorn calculi are large branching stones filling part of renal pelvis and calyces and can be complete or partial depending on the level of collecting system occupancy. Staghorn stones form only 4% of urinary calculi (~50% bilateral), with high morbidity and mortality potential and are a treatment challenge.

**Case Description.** A 72-year-old woman with a history of arterial hypertension admitted to Rīga East University Hospital complaining of right flank pain. Ultrasound imaging revealed bilateral hydronephrosis, CT showed staghorn calculi in both kidneys (right 2 × 1,2 cm, left 2,3 x 1,5 cm) with additional smaller concerns in calyces. Blood analysis marked elevated parathormone levels (120,2 pg/ml), scintigraphy revealed chronic obstruction, urine retention.

Consequently, a decision was made to perform a percutaneous nephrolithotomy surgery on each side, which was done in two stages: 1) stenting of the renal pelvis in a lithotomy position 2) access of renal pelvis under ultrasound control (prone position), and visualization of stones with a 24Fr nephroscope. Lithotripsy was done using the Schockpulse system by Olympus with complete stone removal,<sup>14</sup> Ch Foley nephrostome was inserted for drainage. The postoperative period was uneventful, patient was discharged to prepare for the same procedure for the right kidney after 4 months. A follow up scintigraphy showed improvement of renal function-no mechanic obstruction, increase of GFR-44.7(was 43.7).

Patient continued therapy with endocrinologist due to suspicions of hyperparathyroidism.

**Summary.** This case report highlights a rare case of bilateral staghorn calculi combined with hydronephrosis due to undiagnosed hyperparathyroidism, treated by PCNL on both sides, which improved kidney function. This situation shows possibilities and successful results of minimally invasive treatment even for large staghorn stones.

**Conclusion.** A 72-year-old polymorbid patient was diagnosed with bilateral staghorn calculi and hydronephrosis. A Percutaneous Nephrolithotomy was performed and a potentially life threatening situation was prevented.

## TRAUMATIC ABDOMINAL WALL HERNIA WITH CAECUM PERFORATION

Authors: *Elvijs Ošs*<sup>1</sup>, *Anastasija Kraveca*<sup>1</sup>

Scientific research supervisor: Dr. *Jānis Karlsons*<sup>2</sup>

<sup>1</sup>*Rīga Stradiņš University, Latvia*

<sup>2</sup>*Children's Clinical University Hospital, Latvia*

**Keywords.** Abdominal wall trauma, pediatrics, caecum perforation, TAWH.

**Introduction.** Trauma is one of the leading causes of morbidity and mortality among the pediatric population. Approximately 1% of patients with blunt abdominal trauma are found with traumatic abdominal wall hernias (TAWH). In handlebar injury, focal force applied to the abdominal wall over the small surface area of the handlebar end leads to disruption of the abdominal musculature with associated risk of intraabdominal injury. Skin contusion may be present, but the skin, being more elastic, remains intact.

**Case Description.** An 11-year-old boy was referred to Children's Clinical University Hospital Emergency Department after having fallen from his bicycle. Upon presentation, the boy was slightly sleepy, had a history of vomiting. Clinical examination revealed a subcutaneous hematoma and URQ tenderness. An abdominal US showed tissue thickening in URQ with no changes in the abdominal organ's structure, no free fluid, suggesting abdominal wall hematoma. An abdominal CT was also performed which revealed a defect of the abdominal wall, free air with a small amount of free fluid was found, therefore diagnostic laparoscopy was performed. During surgery TAWH and caecum, perforation was noticed. Conversion to laparotomy was performed. 1.5 cm circular colon defect was sutured and a terminal ileostomy performed. The patient was discharged 8 days after, the stoma was closed 40 days after.

**Summary.** Traumatic abdominal wall hernias (TAWH) with bowel injury are rare after blunt trauma. A vertical abdominal X-ray or CT should be performed, to evaluate possible free air, even objectively and US shows simple hematoma.

**Conclusion.** CT revealed an abdominal wall defect with a perforated bowel, which was missed on immediate ultrasound examination. It is important to evaluate the risk of TAWH and perforation taking into account trauma mechanism, objective findings and US, X-ray and CT data, even if immediate examination doesn't suggest any life-threatening injuries.

## UNDERSTANDING HIRSCHSPRUNG'S DISEASE

Author: *Arta Katkeviča*<sup>1</sup>

Scientific research supervisor: Assist. Prof. *Astra Zviedre*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

**Keywords.** Hirschsprung's Disease, agangliosis.

**Introduction.** Hirschsprung's disease is a congenital disorder that is characterised by a complete absence of ganglion cells in myenteric and submucosal plexus for a variable length of colon. Ganglion cells act as points within the enteric nervous system to help coordinate and facilitate bowel relaxation. In their absence aganglionic areas of bowel become spastic causing intestinal obstruction.

**Case Description.** A 4-month-old female infant was admitted to Children's Clinical University Hospital due to constipation. Girl was born at 35+2 weeks of gestation and diagnosed with Downs syndrome (Trisomy 21). Meconium passed after almost 48 hours. At physical examination patient presented abdominal distension with palpatory feces. Contrast enema revealed spastic rectal ampulla and distal sigma and prestenotic dilatation after. To investigate potential organic disease a full thickness rectal biopsy was obtained. Tissue examination revealed agangliosis establishing diagnosis of HD. Subsequently modo Soave-Georgesson pull through surgery was performed completely removing rectum and distal sigma about 27cm overall. Colo- anal anastomosis was made. Patient was admitted to hospital again due to large bowel impermeability associated with spastic anal sphincter and were treated with intrasphincteric Botulinum toxin injections.

**Summary.** The diagnosis and management of these patients are quite challenging. Follow-up with a multidisciplinary team (pediatricians, pediatric surgeons, geneticists, physical therapists, nurses, nutritionists) are the basics to successful outcome.

**Conclusion.** Quick and correct diagnosis of HD is the key to accurate treatment. Without proper treatment at an early age a significant group of children may suffer from severe complications later in life. These complications include acute enteritis or toxic megacolon.

Persistent constipation or recurrent enterocolitis after pull-through for Hirschsprung's disease should be managed according to the cause. They could be managed medically, by simple surgical procedures, or a redo pull-through may be required in some cases.

## TOTAL THYROIDECTOMY OF GIANT NON-TOXIC MULTINODULAR GOITER

Authors: *Laurentiu-Alin Dumitrache*<sup>1</sup>, *Diana-Maria Rusu*<sup>1</sup>, *Maria Mirabela Fratila*<sup>1</sup>

Scientific research supervisor: Asoc. Prof. Dr. med. *Ciprian Tănăsescu*<sup>1</sup>

<sup>1</sup> *“Lucian Blaga” University of Sibiu, Romania*

**Keywords.** Multinodular goiter, total thyroidectomy.

**Introduction.** The multinodular goiter (MNG) is the most common affliction of the thyroid. Very large goiters can be associated with difficulties regarding swallowing, breathing and, in some cases, may require surgical intervention. The World's Health Organization estimates that multinodular goiter afflicts about 12% of the world's population, the numbers being lower in Europe.

**Case Description.** We present you the case of a 62-year-old patient, known with stage 2 hypertension, who arrived on the Surgery Unit for an anterior cervical tumorous formation, a sensation of constriction on this level, hypersialorrhea, dysphonia, symptomatology which began approximately one year ago. The physical examination highlights the left thyroidian lobule's increase in volume, a tumorous formation on the right scapula and tumorous formations located bilaterally on the submandibular level. After a proper pre-operative preparation, the surgical intervention takes place with orotracheal intubation under general anesthesia. The surgical intervention includes total thyroidectomy, drainage and bandaging.

Favorable post-operative evolution, hemodynamically and respiratory stable patient, afebrile, healing wound, no reaction, permeable drainage tube that is suppressed during the first post-operative day. Total thyroidectomy completely removes the evolution of the disease, it lowers the rates of local recurrence and avoids the substantial risks of surgical intervention. Total thyroidectomy is safe and can be done with low rates of complications, equal with the world's centers of excellence.

**Summary.** Patient who arrived on the Surgery Unit for an anterior cervical tumorous formation was diagnosed with a non-toxic multinodular goiter of about 10 cm. After total thyroidectomy, histopathological results showed a micro and macrofollicular adenoma without atypia.

**Conclusion.** The neck must be periodically palpated for a pre-emptive finding of possible nodules. In this case, the treatment is much easier, and the recovery period is much shorter and simpler. The recommended surgical intervention for multinodular goiter is total thyroidectomy.

## IS A CALCANEUS FRACTURE TREATMENT AN EMERGENCY?

Author: *Jekaterina Kamenska*<sup>1</sup>

Scientific research supervisor: Dr. *Vitālijs Pasterns*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East University Hospital, Latvia*

**Keywords.** Calcaneal fracture, complications, soft tissue necrosis, delayed treatment.

**Introduction.** Calcaneus is the most frequently fractured tarsal bone and accounts for 60% of all tarsal fractures. Damage of surrounding soft tissues is usual because of bone fragments displacement, as a result there is an increased risk of postoperative wound complications. Fracture blisters are common.

**Case Description.** A 23 years-old healthy female admitted to a regional hospital with diagnosis of closed intra-articular multifragmentar calcaneus fracture. CT scan showed significant bone fragment (a big part of posterior facet with sustentaculum tali) medial displacement. Because of the massive swelling surgical treatment was delayed and cast applied. The first skin changes - multiple blisters- appeared on the medial foot side. The pressure of displaced fragment on the medial foot side caused decubitus from the inside. It was misdiagnosed as fracture blisters in progress. After two weeks the patient was transferred to Rīga East University Hospital for further surgical treatment in the orthopaedic department. Physical examination revealed 9×4 cm big necrotic area and loss of sensation on foot sole (damage of medial and lateral plantar, inferior calcaneal nerves). It was decided to perform necrectomy, revision and release of the posterior tibial nerve, followed by osteosynthesis with external fixation and K-wires. After that reconstruction with an inguinal skin flap was done. When the wound was healed, the 2nd operation was carried out. Osteosynthesis through lateral sinus tarsi approach, fixation with plate and screws. Both surgeries were completed without any complications.

**Summary.** Complications following calcaneal fractures are common. In this case, surgical treatment had to be an emergency. On follow-up after 3 months patient is able to walk without pain. Nerve damage is permanent.

**Conclusion.** The important factor to consider is proper surgical timing and planning. Inappropriate treatment leads to major complications which are difficult to solve.

## ENDOVASCULAR TREATMENT OF THE PATIENT WITH THROMBOTIC OCCLUSION OF THE INFERIOR VENA CAVA AND ILIAC VEINS AGAINST THE BACKGROUND OF A PERMANENT CAVA-FILTER

Author: *Diyora Achilova*<sup>1</sup>

Scientific research supervisor: Dr. med. *Nazira Alimhodjayeva*<sup>1</sup>

<sup>1</sup> *Tashkent Pediatric Medical Institute, Uzbekistan*

**Keywords.** Cava-filter, iliac veins.

**Introduction.** The feasibility of endovascular interventions in a patient suffering from chronic occlusion of the inferior vena cava against the background of an implanted permanent cava-filter.

**Case Description.** A clinical case of patient B., 56 years old, is presented. After re-after suffering from deep vein thrombosis of the lower extremities in 2009, which was complicated by a pulmonary embolism, he was implanted with a domestic cava-filter "Corona". In December 2017 he was admitted with lower vena cava syndrome, accompanied by severe pain, edema of the genitals and lower extremities, and inability to walk. Occlusions of the inferior Vena cava in the area of the CA - VA filter and distal, the right and left common iliac veins throughout, and the right common femoral vein were diagnosed. Partial recanalization of the right and left sides was performed simultaneously external iliac veins and the left common iliac vein, as well as the inferior Vena cava to the level of the cava-filter and catheter thrombolysis Actilize for three days with the initial introduction of a bolus of 5 mg / hour, on the second day 2 mg/hour, on the third day 1 mg / hour. From the second day, there was a distinct decrease in swelling of the lower extremities. After 3 days, recanalization, transluminal balloon angioplasty, and stenting of the inferior vena cava were performed with the transition to the left common iliac, external iliac, and General femoral veins.

**Summary.** There were no complications during surgery, the control angiography showed a good result, and the stents were passable. There were no complications during the therapy.

**Conclusion.** The method of restoring venous outflow by recanalization, angioplasty, and stenting of the inferior Vena cava throughout, with the installation of a stent through a previously installed cava filter, is highly effective.



## IMPORTANCE OF THE SECRETORY PHASE IN CT IMAGING IN THE POLYTRAUMA PROTOCOL IN PATIENT WITH RENAL INJURIES

Authors: *Justyna Lipińska*<sup>1</sup>, *Lukasz Lipiński*<sup>1</sup>

Scientific research supervisor: Dr. med. *Magdalena Woźniak*<sup>1</sup>

<sup>1</sup> *Medical University of Lublin, Poland*

**Keywords.** Radiology, polytrauma protocol, secretory phase in CT imaging, renal injury.

**Introduction.** Computed tomography (CT) imaging is one of the basic diagnostic modalities in the case of multi-organ trauma, and apart from a detailed physical examination, it belongs to the second stage of treatment of a patient after injury according to ATLS (Advanced Trauma Life Supports). CT imaging in the polytrauma protocol usually includes organs and tissues located between the top of the head and the symphysis pubis without contrast and also with contrast enhancement. During the CT examination in the polytrauma protocol with the use of contrast, three phases following the administration of the contrast agent can be distinguished, i.e. the arterial, venous and secretory phases. The last phase takes place 3-5 minutes after administration of the contrast agent. It occurs when contracted contrast-enhanced urine secreted by the kidneys is visible in the calyces and renal pelvis and fragmentarily in the ureters.

**Case Description.** A 15-year-old patient was admitted to the University Children's Hospital in Lublin in a serious condition after a multi-organ trauma resulting from a traffic accident. A CT scan was performed in the polytraum protocol, initially in the standard protocol. The fragmentation of the left kidney was visualized, and therefore the protocol was extended to include the secretory phase in order to diagnose potential damage to the pelvicalyceal system. In the secretory phase, the flow of contrasted urine beyond the pelvicalyceal system was visualized.

**Summary.** Based on the above radiological picture, it was decided to perform surgery.

**Conclusion.** Only performing CT imaging during the secretory phase can confirm or rule out traumatic damage to the pelvicalyceal system and / or ureter. Administration of a contrast agent is essential for a complete evaluation of suspected kidney injury in order not to overlook the damage to the collecting system.

## LUMBAR PUNCTURE TASK TRAINER FOR REMOTE LEARNING – TECHNICAL REPORT

Author: *Aleksandrs Oborins*<sup>1</sup>

Scientific research supervisor: Assoc. Prof. *Oļegs Sabeļņikovs*<sup>1</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Simulation-based learning, task trainer, lumbar puncture.

**Introduction.** The ability to train on medical simulators before entering hospitals is crucial for professional development and patient safety. Lockdown caused by COVID-19 pandemic made it impossible to visit simulation centers to train practical skills on-site.

Students could practice such skill as lumbar puncture individually, with a remote guidance of a teacher, using task trainers, however commercial medical simulators are too expensive and require special maintenance.

That is why the purpose of this work was to create a relatively cheap lumbar puncture task trainer.

**Case Description.** A special 3D model of two lumbar vertebrae was created and then printed out of polylactic acid (PLA) filament using Ultimaker S5 3D Printer. A parallelepiped shape mold was made of a cardboard, then lubricated with silicone spray.

Soft rubber tube was placed in spinal canal of vertebra model, then it all was placed in the prepared mold, filled with dissolved gelatin and let to set.

The resulting task trainer was equipped with 50mL syringe and stopper for simulated cerebrospinal fluid and a set of medical consumables for lumbar puncture procedure: medical drapes, disposable tweezers, alcohol wipes, sterile surgical gloves, test tubes, lumbar puncture needles.

**Summary.** The development of lumbar puncture task trainer requires special knowledge and skills such as anatomy, 3D modeling, engineering, and material science. However, due to cheap materials, simple and fast production process it is more cost-effective solution than commercialized task trainers.

Created lumbar puncture sets got positive feedback from participants and were marked as helpful and effective tool to master lumbar puncture skill.

**Conclusion.** Instructor has conducted an online workshop, using a commercial lumbar puncture task trainer. At the same time 30 members of Neurology and Neurosurgery Student Academic Society were able to train lumbar puncture skill on invented task trainers remotely.

## IS LATE MICROVASCULAR TISSUE FLAP NECROSIS A COVID-19 COMPLICATION?

Author: *Olga Rimdenoka*<sup>1</sup>

Scientific research supervisor: Dr. *Ervins Lavrinovičs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga Eastern Clinical University Hospital, Microsurgery Centre of Latvia, Latvia*

**Keywords.** Free flap, COVID-19.

**Introduction.** Late flap necrosis is rare complication, which possible association with COVID-19 was never described previously.

**Case Description.** 51-year-old male patient was hospitalized because of fistula and redness in left parietal region. In anamnesis 32 years ago, patient had a gun shot injury in the left parietal and temporal region, after which he underwent debridement and cranioplasty with synthetic bone implant. Now an infection of the implant was diagnosed, and the patient underwent an evacuation of it and an excision of the fistula, which resulted in soft tissue and bone defect. Closure of the defect was performed with musculocutaneous m. latissimus dorsi free flap. Two weeks after the operation patient was diagnosed with COVID-19 infection. He experienced febrile temperature, cough and lack of breath. Four weeks after the operation necrosis of the flap occurred, and evacuation of the necrotic tissue and closure of the defect with local tissue flaps was performed. Intraoperatively healing of the flap to the surrounding tissue was observed, 0.5 cm flap skin margins were pinkish and well vascularised. The muscle and the skin centre of the flap were necrotic. Meanwhile, blood flow in the pedicle was observed up to the middle of the muscle. There were no signs of flap infection. The pathohistological examination revealed aseptic necrosis of the flap tissue. No signs of vasculitis or thrombi were found. The findings corresponded to 1-2 weeks old initial lesion, which coincides with COVID-19 illness.

**Summary.** Late microvascular free flap necrosis occurred in COVID-19 positive patient. The untypical clinical and pathohistological findings and the lack of other reasons lead to associate this complication with COVID-19.

**Conclusion.** Untypical clinical and pathohistological findings and the lack of other reasons lead to think that late microvascular tissue flap necrosis is possible COVID-19 complication. Meanwhile, the exact mechanism is unknown and must be investigated.

# PEDIATRICS AND GYNEACOLOGY

## COVID-19 ASSOCIATED MYOCARDITIS IN PEDIATRIC PATIENT

Authors: **Rebeka Kūma**<sup>1</sup>, **Rūta Tērauda**<sup>1</sup>

Scientific research supervisors: Dr. **Liene Čupāne**<sup>2</sup>,  
Dr. **Gunta Laizāne**<sup>2</sup>, Dr. **Inta Bergmane**<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Case report, COVID-19, coronavirus disease 2019, SARS-CoV-2, myocarditis, heart, cardiovascular, children, infection.

**Introduction.** Coronavirus disease -2019 (COVID-19) is new viral infection disease, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Most common clinical symptoms include fever, cough, sore throat, headache and fatigue. Cardiovascular complications of COVID-19 have been reported in adult including myocarditis, however, less is known about the myocardial involvement in children.

**Case Description.** A 10-year-old boy with history of mild persistent asthma, without cardiovascular risk factors or previous history of cardiovascular disease presented to the emergency department with 6 days of cough, fever (up to 38.4 C), headache, tested positive on COVID-19. His vital signs were notable for tachycardia (heart rate of 138 b.p.m.), tachypnea (respiratory rate, 22 breaths/min). Physical examination was otherwise normal, with no signs of pneumonia.

During hospitalisation on day 5 of illness with elevation in cardiac markers were detected high-sensitivity troponin I 1458mg/L and N-terminal probrain natriuretic peptide 310 pg/mL. Search for other possible cardiotropic viral agents like influenza, Parvovirus B19, EBV IgM was negative. Cardiovascular magnetic resonance confirmed acute myocarditis-pericardial effusion of the left ventricle in the lower-lateral, lateral wall of the middle segments. Metoprolol was started. After 24 hospitalisation day patient was discharged with recommendations for follow-up next month.

**Summary.** The suspicion of myocarditis was based on specific diagnostic tool cardiovascular magnetic resonance and cardiac markers elevation. Endomyocardial biopsy could not be employed due to the urgency and young age of the patient.

**Conclusion.** COVID-19 may result in cardiac injury through multiple potential mechanisms, including viral invasion of cardiomyocytes resulting in cellular damage. Mostly, myocarditis in children is attributable to viruses, such as myocarditis-enterovirus, herpes virus (Ebstein-Barr virus), and influenza A virus. This case report is the first known COVID-19 associated myocarditis in pediatric patient Latvia.

## A SPORADIC GENETIC MUTATION WITH A PROGRESSIVE AILMENT IN NEONATES

Author: *Parinoor Dhindsa*<sup>1</sup>

Scientific research supervisor: Dr. *Harmanjot Kang*<sup>2</sup>

<sup>1</sup> *Ternopil National Medical University, India*

<sup>2</sup> *Fortis Hospital, India*

**Keywords.** Hutchinson–Gilford Syndrome, Premature aging, Lamin A gene mutation.

**Introduction.** Progeria, also known as Hutchinson–Gilford Syndrome, is an extremely rare genetic disorder characterized by premature aging, in which there is a mutation of the LNMA (Lamin A) gene leading to the formation of an abnormal protein known as ‘progerin’ (a truncated version of LNMA protein), which makes cells unstable. It affects about one in every 8 million children, explaining its rarity. The average age of survival is from 13–14 years. Affects predominantly the skin, musculoskeletal system, vasculature.

**Case Description.** A 5-year-old girl presented to the Out-Patient Department of the Paediatric Department for precise investigation due to some persistent manifestations. The patient presented with a few key features for the identification of the medical condition, namely-- premature ageing and apparent dwarfism with height 80 cms (corresponding to height at 50th percentage in a normal 4-year-old girl being 100.3 cms). The patient also had a large head with prominent scalp veins, a small disproportionate face, an underdeveloped jaw (micrognathia) and protruding eyeballs. On further examination, the patient also had small ear lobes and a beaked nose. The patient’s intelligence was normal.

For diagnosis, on urine examination and estimation of erythrocyte sedimentation rate, the values appeared to be within the normal range. Radiographic studies showed normal condition of the skull. X-ray findings of extremities showed osteoporotic changes that usually appear at an older age, showing a paramount evidence of a strong persistence of progeria.

**Summary.** It is necessary to determine and study gerontological specific diseases, which can lead to severe lethal conditions. The signs of the illness generally appear between 10–24 months of age. On a factual basis, due to the rarity of the disease, there are only about 400 children living with progeria worldwide.

**Conclusion.** Hence, HGPS is very rare yet severely fatal genetic disorder which has left many families in the hope of getting a proper cure for the disease. Hopefully, one day, there will be no cases of Progeria in the whole world.

## COEXISTENCE OF CHARCOT-MARIE-TOOTH DISEASE TYPE 1A AND CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY: A CASE REPORT

Author: *Krista Skrējāne*<sup>1</sup>

Scientific research supervisor: Dr. *Elīna Millere*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Chronic inflammatory demyelinating polyneuropathy, Charcot-Marie-Tooth disease.

**Introduction.** Charcot-Marie-Tooth disease type 1 (CMT<sub>1</sub>) is a group of hereditary demyelinating peripheral neuropathies with the estimated prevalence of 1-5/10 000. Type 1A is the most common form of CMT<sub>1</sub>, comprising 70%-80% of type 1 cases. Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) is an acquired, immune-mediated neuropathy. The low prevalence of childhood CIDP (<0.5 per 100,000) makes the coexistence of both diseases a rare occurrence.

**Case Description.** The patient was an almost 14-year-old male admitted to Pediatric Neurology Department for further examination. He complained of a 4 month history of progressive distal leg weakness, manifesting as daily tripping and falling. Patient also noted an inability to keep up with his peers, even though previously he was participating in athletic activities. Physical examination revealed features of distal muscle weakness and atrophy in lower extremities, diminished deep tendon reflexes, distal hypoesthesia, pes cavus bilaterally. Nerve conduction study revealed a motor-sensor axonal demyelinating polyneuropathy. Cerebrospinal fluid analysis showed albuminocytologic dissociation (total protein 0.75 g/L, white cell count 3×10<sup>6</sup>/L) and MRI of the spine demonstrated thickening and contrast enhancement on the conus medullaris and cauda equina nerve roots. Due to initial suspicion of CMT disease genetic analysis of PMP22 duplication was carried out and it confirmed CMT<sub>1A</sub> subtype.

**Summary.** Patient was diagnosed with both conditions – CMT<sub>1A</sub> and CIDP. Therapy with intravenous immunoglobulins was initiated.

**Conclusion.** The coexistence of CMT and CIDP is rare and a diagnostic challenge, however, certain clinical manifestations and investigation findings suggest coexisting conditions. CIDP is a treatable condition and a misdiagnosis can impact patients' quality of life; therefore, it is important to acknowledge the coexistence of both neuropathies.

## HEMORRHAGIC OVARIAN CYST WITH HEMOPERITONEUM AS THE FIRST PRESENTATION OF THROMBOCYTOPENIA: A CASE REPORT

Author: *Anete Vanaga*<sup>1</sup>

Scientific research supervisors: Dr. *Elizabete Pumpure*<sup>1,2,3</sup>, Dr. *Zane Grabe*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Latvia*

<sup>3</sup> *Rīga Maternity Hospital, Latvia*

**Keywords.** Hemorrhagic ovarian cyst, thrombocytopenia.

**Introduction.** Hemorrhagic ovarian cyst is an adnexal mass, which is formed because of occurrence of bleeding into a follicular or corpus luteum cyst, and it is relatively common in women of reproductive age. In this case report, a hemorrhagic ovarian cyst with hemoperitoneum was found in a young patient, possibly as the first presentation of thrombocytopenia.

**Case Description.** A 23 years old woman was admitted to the hospital with complaints of severe pain in the epigastric region. The patient was examined, the diagnosis of acute appendicitis was excluded. Abdominal and retroperitoneal ultrasound revealed free fluid in pelvis, and gynecological ultrasound revealed a hemorrhagic cyst in the right ovary. The patient was hospitalized in gynecology department for therapy and monitoring. In sonography, increased free fluid in the abdominal cavity was revealed. Blood tests were performed. Beta hCG was  $<0.100$  mIU/l. An examination revealed that the patient had thrombocytopenia ( $55 \times 10^9/L$ ), the patient was managed conservatively, and complaints vanished. HIV, EBV, CMV, antibodies against thrombocytes were negative. Additionally, mild neutropenia and anemia was found. The patient was discharged from the hospital with a recommendation to do further examinations, and the diagnosis of idiopathic thrombocytopenic purpura was set by a hematologist.

**Summary.** This case report shows how hemorrhagic ovarian cyst with intra-peritoneal hemorrhage may be the first symptom of thrombocytopenia.

**Conclusion.** The rupture of an ovarian follicle is a very common benign condition in women of the reproductive age group. Any associated bleeding is unlikely to be significant unless there is an underlying severe hemostatic derangement, and, in this case, the management differs. This case report emphasizes the role of simple investigations such as full blood count before making a decision to perform surgery.

## RECURRENT NONSUICIDAL SELF-INJURY IN ADOLESCENT AS A CASE OF SEVERE, LIFE-THREATENING BACTERIAL INFECTIONS

Author: **Gabriela Kronberga**<sup>1</sup>

Scientific research supervisor: Dr. **Inga Ziemele**<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Nonsuicidal self-injury, schizotypal disorders.

**Introduction.** Nonsuicidal self-injury is the act of harming one's own body without the intent to die. When adolescents experience strong negative emotions, they experiment with a range of coping behaviours, including self-injury which can lead to life-threatening events.

**Case Description.** A 16 years old female was admitted to Children's Clinical university hospital of Rīga with a history of diarrhoea, haematemesis, haematuria and fever for 5 days. Blood tests revealed severe thrombocytopenia, elevated inflammatory markers and empiric antimicrobials was started. During the treatment, peripheral catheter sites regularly became inflamed and ultrasound showed venous thrombosis. Despite the treatment patient's condition worsened and, on the 5th day of hospitalization due to suspected sepsis patient was transmitted to ICU. Blood cultures were obtained, central venous catheter inserted, and combination of broad-spectrum antimicrobials continued. In dynamics patient's condition improved and she was transferred to the basic department. During the hospitalization, the patient's clinical condition remained variable and multiple cultures were repeated. *Raoultella ornithinolytica* belonging to the Enterobacteriaceae family was found in both blood and stool cultures simultaneously. Overall due to the unusual course of the disease and personnel's observations, possible self-injury was suspected and proved during the hospitalization. After a month, patient was transferred to psychiatric department with initial diagnosis Munchausen's syndrome but later specified as schizotypal disorders. So far, patient has been hospitalized with nonsuicidal self-injury multiple times.

**Summary.** It is a rare case where main cause of recurrent life-threatening bacterial infections was self-harm initiated by mental disorder. Despite psychotherapy and treatment, the patient still returns to the hospital regularly due to new but similar consequences of self-injury.

**Conclusion.** Nonsuicidal self-injury may occur as a basis for severe infections with variable localization and atypical initiator. The recognition of these patients can be challenging and therefore multidisciplinary team plays an important role in resolving these cases.



## A CASE OF TWO SYNCHRONOUS INDEPENDENT PRIMARY MALIGNANCIES: METASTATIC VULVAR SQUAMOUS CELL CARCINOMA AND MULTIFOCAL UROTHELIAL CARCINOMA

Author: *Laine Beķere*<sup>1</sup>

Scientific research supervisors: Dr. *Androniks Mitīldžans*<sup>2</sup>, Dr. *Arta Spridzāne*<sup>2</sup>,  
Dr. *Sergejs Beketovs*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Rīga East Clinical University Hospital, Oncology Centre of Latvia, Latvia*

**Keywords.** Vulvar SCC, urothelial carcinoma.

**Introduction.** The incidence of multiple primary cancers is 0.3-4.3%. The cases of synchronous metastatic vulvar squamous cell carcinoma(SCC) and urothelial carcinoma(UC) have not been reported. Furthermore, vulvar cancer represents 3-5% of female genital tract malignancies and cutaneous metastases from it are extremely rare.

**Case Description.** A 75-year-old woman presented with a rapidly growing mass of the vulva. Physical examination revealed a tumor on the left labia majora, an exophyte formation of the skin of mons pubis and enlarged left inguinal lymph nodes (LN). Histology showed moderately-differentiated SCC. A CT-scan confirmed the vulvar tumor(8×2.3cm), specific lymphadenopathy in left groin and unexpectedly found a mass at the upper pole of right kidney(7×4.2cm), a tumor of the bladder(2.8×3.4cm) invading the right ureteral ostium. Distant metastases were absent. Multidisciplinary team recommended a complex two-step surgery. Firstly, left pelvic LN dissection was done followed by frozen-section-histology. After that laparotomic nephroureterectomy with partial cystectomy and total hysterectomy with bilateral adnexectomy were performed. The second step included excision of skin lesion, left hemivulvectomy with reconstruction and bilateral inguinofemoral lymphadenectomy. Pathological evaluation showed two independent malignancies - moderately-differentiated SCC of the vulva with metastasis in the skin and inguinofemoral LN, poorly-differentiated UC of the kidney, ureter and bladder. Patient received radiation therapy(48/2 Gy). Woman was disease-free after 12 months follow-up.

**Summary.** We report an extremely rare case of a 75-year-old woman who had carcinomas in the vulva and the urinary system simultaneously. She was treated successfully using combined modalities of surgery and radiation therapy.

**Conclusion.** Thorough investigation of the oncological patient may reveal not only the dissemination of tumor, but also an occult malignancy. Treatment of double malignancies is a professional challenge that requires careful planning and multidisciplinary approach to find the best option for the patient. Modern radical surgery could prolong survival and improve the quality of life.

## NON-PCV10 STREPTOCOCCUS PNEUMONIAE CAUSED MENINGITIS IN PEDIATRIC PATIENT

Author: *Rūta Tērauda*<sup>1</sup>

Scientific research supervisor: Dr. *Gunta Laizāne*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** PCV10, pneumococcal meningitis.

**Introduction.** Term “pneumococcal meningitis” refers to leptomeningeal inflammation caused by *Streptococcus pneumoniae*. PCV10 vaccine has significantly decreased morbidity of invasive pneumococcal infections in children, although limited epidemiological data of non-PCV10 serotype caused infections are available.

**Case Description.** 6 months old girl was hospitalised at Children's Clinical University Hospital with complaints of vomiting, fever, sleepiness, refusal of feeding. Objective findings included positive SIRS, hyperaemia of the pharynx and neck stiffness. Patient had no comorbidities and was vaccinated appropriately for the age. With suspicion of bacterial meningitis, therapy with i/v ceftriaxone, vancomycin and dexamethasone was started. Cerebrospinal fluid (CSF) analysis revealed characteristic changes of bacterial inflammation, *Streptococcus pneumoniae* deoxyribonucleic acid (DNA) was detected.

During hospitalisation patient presented with hypertension, convulsions, head magnetic resonance imaging (MRI) scan revealed cytotoxic oedema, encephalitis or septic foci was suspected. Therapy was supplemented with p/o levetiracetam, s/c enoxiparin and p/o propranolol. Week later whole-body MRI scan showed progressing leptomeningeal infiltration, ventricular enlargement, but no septic foci was found. *Aspergillus* spp. DNA was detected in patient's blood, i/v voriconazole was started.

At the 15th day of hospitalisation *Streptococcus pneumoniae* DNA was repeatedly detected in CSF, molecular serotyping revealed non-PCV10 serotype o6C – o1. Primary immunodeficiency was suspected. Later *Streptococcus pneumoniae* DNA was not detected, head MRI scan revealed progressing supratentorial hydrocephaly without intraventricular obstruction. As the patient's condition stabilised, she was discharged from hospital.

During control hospitalisation month later, head MRI scan revealed no leptomeningeal inflammation. Patient had no persisting neurologic consequences, although immunodeficiency cannot be completely ruled out yet.

**Summary.** The case report shows importance of multidisciplinary approach in patient's treatment with pneumococcal meningitis and confirms rare non-PCV10 *Streptococcus pneumoniae* serotype circulation in Latvia.

**Conclusion.** Despite PCV10 vaccination, non-PCV10 serotype caused *Streptococcus pneumoniae* caused meningitis should be suspected in children with evidence of bacterial meningitis.

## CHILDHOOD POLYARTERITIS NODOSA

Author: *Elizabete Marta Zaharāne*<sup>1</sup>

Scientific research supervisor: Prof. *Valda Staņēviča*<sup>1,2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Children's Clinical University Hospital, Latvia*

**Keywords.** Pediatrics, systemic vasculitis, polyarteritis nodosa.

**Introduction.** Childhood polyarteritis nodosa is a rare systemic necrotizing vasculitis affecting small and medium size arteries. The incidence, prevalence, and etiology of this disease is unknown. Clinical presentation is based on affected vessels most often involving skin, muscles, joints, nervous system and kidneys. Diagnosis is established after fulfilling EULAR/PRINTO/PRES criteria for childhood polyarteritis nodosa.

**Case Description.** In autumn of 2017 8 years old boy presented to emergency room with fever, fatigue, myalgia and arthralgia. He was hospitalized for further investigation during which he developed skin nodules that were taken for biopsy. Typical findings in biopsy along with patient's other symptoms fulfilled criteria for the diagnosis of childhood polyarteritis nodosa. Treatment with glucocorticoids and cyclophosphamide was induced which led to clinical improvement. After induction therapy maintenance therapy with azathioprine was started, but the patient experienced relapse therefore the therapy was changed. His first relapse hasn't been his only one therefore therapy has been changed multiple times and wide spectrum of medications including glucocorticoids, cyclophosphamide, azathioprine, methotrexate and mycophenolate mofetil has been tried. In summer of 2020 due to his refractory disease the decision to start biological therapy with Tocilizumab was made. In autumn of 2020 the patient received Tocilizumab for the first time and since then he hasn't had any relapses and it has been possible to reduce the dosage of glucocorticoids as well.

**Summary.** Childhood polyarteritis nodosa is a rare systemic vasculitis. This report demonstrates a case of a young boy diagnosed with it early on after symptoms first appeared but the course of treatment has been difficult because of patient's poor response to the therapy.

**Conclusion.** Both diagnosing and treating vasculitis can be difficult due to its unspecific symptoms mimicking wide spectrum of different diseases as well as the unpredictable response to the therapy of each individual patient.

## THE DIAGNOSTICS AND MANAGEMENT OF FRONTAL LOBE GLIOMA IN PREGNANCY

Authors: *Agnė Česnauskaitė*<sup>1</sup>, *Andrius Montrimas*<sup>1</sup>  
Scientific research supervisor: Dr. *Neringa Česnauskienė*<sup>2</sup>

<sup>1</sup> *Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup> *Vita Longa Clinic, Lithuania*

**Keywords.** Glioma, pregnancy.

**Introduction.** It is not proved that pregnancy increases the risk of the development of gliomas, but it is associated with higher growth rate of gliomas, earlier onset of symptoms and more frequent glioma induced seizures.

**Case Description.** A 32-year-old woman was found unconscious with convulsions at 16 weeks and 6 days of pregnancy and was admitted to the Hospital of Lithuanian University of Health Sciences Kauno Klinikos with repeated seizures during transportation. A day before, the patient felt confused and hardly found her way home. After successful treatment of seizures, the patient was still disoriented, moaning and answered only basic questions. An urgent head computed tomography scan was performed but there were no signs of ischemic or hemorrhagic events. Head magnetic resonance imaging scan showed a 4,7×3,6×2,9 cm pathologic infiltration zone in the right frontal lobe that was nonenhancing and resembling a low-grade glial tumor, no other pathological signs were found. A gynecologist's examination found nothing unusual. 6 days later, the tumor was surgically removed during osteoplastic craniotomy. Pathological diagnosis was anaplastic astrocytoma, grade III, IDH-mutant, BRAF V600 mutation was not found. A multidisciplinary team decided to start a course of radiotherapy (56 Gy/28 fr) 2 weeks after the surgery since the location of the tumor was distant from the uterus and therefore the doses of radiation should do no harm to the fetus. Chemotherapy was contraindicated due to the pregnancy, so a caesarean delivery was planned at 32 weeks of pregnancy. The newborn's Apgar score was 7-9, respiratory insufficiency was present despite lung maturation, but was successfully treated. After giving birth, the mother started a course of chemotherapy with temolozomide.

**Summary.** Since pregnancy can induce the growth rate of glioma and strong evidence about its treatment during pregnancy is lacking, the management of tumour is still questionable.

**Conclusion.** This case represents the diagnostics and management of frontal lobe glioma in pregnancy. Both diagnosing and treating vasculitis can be difficult due to its unspecific symptoms mimicking wide spectrum of different diseases as well as the unpredictable response to the therapy of each individual patient.

## A CLINICAL CASE REPORT OF ADNEXAL TORSION: DIAGNOSTIC CHALLENGES

Authors: *Karolina Baltrušaitytė*<sup>1</sup>, *Paulius Burkauskas*<sup>1</sup>

Scientific research supervisor: Dr. *Sonata Barilienė*<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup>*Hospital of Lithuanian University of Health Sciences, Lithuania*

**Keywords.** Ovarian torsion, adnexal torsion, salpingoovarectomy.

**Introduction.** Adnexal torsion (AT) is a pathology during which the ovary completely or partially rotates around the ligament of the ovary, the suspensory ligament or the fallopian tube. It affects 5.9 / 100,000 women, however, the true prevalence is unclear, due to an accurate diagnosis that could only be made while performing a surgery. AT is a dangerous condition, which may lead to the complications such as the loss of fertility and peritonitis.

**Case Description.** A 50-year-old woman was hospitalized with an acute abdominal pain, nausea and vomiting. During palpation abdomen was soft, painful left spina iliaca superior projection. Abdominal X-ray imaging revealed no pathology. During abdominal ultrasound examination and CT scan a cystic mass ~ 6 cm in diameter was noticed in the projection of the right ovary. The left ovary did not reveal any pathology. The patient was discharged home for the further treatment due to no acute gynecological condition. However, after 5 days of persistent pain the patient was repeatedly hospitalized. During transvaginal ultrasonography (TVUS) ovary cyst was detected on the right side and AT with 10cm cystic mass on the left. In order to optimize outcomes, the structures were successfully removed by bilateral adnexectomy.

**Summary.** This clinical case presents the severity of diagnosing AT due to nonspecific symptoms and the lack of information from the imaging studies.

**Conclusion.** AT is a disorder which often occurs in female patients of reproductive age. In case of increased ovarian mass, the risk of ovarian torsion should be assessed. Thus, combination of the clinical symptoms and imaging tests is necessary to make an adequate diagnosis. In order to confirm suspected AT, the diagnostic laparoscopy should be chosen and performed as one of the most significant tests.

## X-LINKED ADRENOLEUKODYSTROPHY

Author: **Rūta Pačinskaitė**<sup>1</sup>

Scientific research supervisors: Prof. **Rymantė Gleiznienė**<sup>2</sup>,  
Dr. **Gertrūda Maziliauskienė**<sup>2</sup>

<sup>1</sup>*Lithuanian University of Health Sciences, Lithuania*

<sup>2</sup>*Hospital of Lithuanian University of Health Sciences, Lithuania*

**Keywords.** X-linked adrenoleukodystrophy, demyelination, adrenal insufficiency.

**Introduction.** X-linked adrenoleukodystrophy (X-ALD) is a rare genetic disorder that manifests in extensive involvement of adrenal glands and white matter of the central nervous system (CNS). The cerebral form of X-ALD predominantly affects boys between ages four and eight years and includes progressive impairment of cognitive functions, behavior, motor skills, hearing, and vision.

**Case Description.** In January of 2021, a 7-year-old boy was admitted to the hospital for investigation of suspected CNS disease. Boy's mother reported noticing changes in her son's behavior and appearance: he was not responding to questions and verbal commands, stopped communicating and developed a squint. Clinical examination revealed exotropia, hypermetropia, an increase in muscle tone and deep tendon reflexes in lower extremities, and a positive Babinski sign in the right leg. Laboratory tests ruled out autoimmune encephalitis and diagnosed adrenal insufficiency. Head computed tomography scans exhibited hypodensity in the periventricular white matter of the parietal and temporal lobes. Brain magnetic resonance imaging scans showed confluent and extensive impairment of the white matter bilaterally. Metabolite abnormalities in the demyelination-affected white matter on MR spectroscopy were detected. Positive family history was established and the patient was diagnosed with X-ALD.

**Summary.** X-linked adrenoleukodystrophy is a rare genetic disorder that manifests in extensive involvement of adrenal glands and white matter of CNS. This case report presents a 7-year-old boy with typical clinical and imaging findings of adrenoleukodystrophy.

**Conclusion.** The progressive nature and lack of pathophysiological treatment options in the advanced stage of the disease lead to a poor prognosis of X-ALD patients. Newborn screening and identification of X-ALD patients aids in timely introduction of adrenal hormone replacement therapy and allows hematopoietic cell transplantation to be carried out prior to the development of permanent cerebral damage.

## ROLE OF IMAGING MODALITIES IN CONSERVATIVE TREATMENT OF RENAL TRAUMA IN CHILDREN

Authors: *Lukasz Lipiński*<sup>1</sup>, *Justyna Lipińska*<sup>1</sup>

Scientific research supervisor: Dr. *Magdalena Woźniak*<sup>1</sup>

<sup>1</sup>*Medical University of Lublin, Poland*

**Keywords.** Radiology, kidneys, pediatric abdominal trauma.

**Introduction.** Kidneys are particularly vulnerable to injury in children because of lesser protection due to more flexible ribs, less perirenal fat and lower abdominal position compared to adults. They are damaged in 8-10% of abdominal injuries and are the most exposed organs to injuries in the genitourinary system. Most of the injuries that lead to kidney damage are blunt and in 80-95% of cases they are accompanied by other injuries, including chest or spine. Computed tomography (CT) remains the gold standard in the diagnosis of abdominal injuries, although ultrasound (US) examinations, as a non-invasive, repeatable and available method, also play a very important role in both diagnosis and treatment monitoring.

**Case Description.** A 5-year-old boy in good general condition was admitted to the hospital after a fall from a bicycle. The physical examination revealed an abdominal injury and a CT scan of the abdominal cavity with contrast was ordered using a spiral protocol.

A perirenal hematoma of the left kidney was visualized, the mass of which was concentrated in the area of the lower pole of the kidney, in the transverse section  $47 \times 40$  mm in size, in the frontal section the hematoma reached the upper pole of the kidney. The cause of the hematoma was a fissure-like rupture of the left kidney between the middle part and the lower pole with lower pole fragmentation.

**Summary.** Within one month of the injury, a follow-up US examination was performed 3 times, which showed normal vascularization of the left kidney and the reduction of the hematoma.

**Conclusion.** A CT is a conclusive modality in the case of kidney injury. The juxtaposition of the patient's clinical picture with the CT scans enables further treatment decisions making, while the US is an essential element of conservative treatment and allows for effective treatment monitoring.

## ROLE OF IMAGING MODALITIES IN CONSERVATIVE TREATMENT OF RENAL TRAUMA IN CHILDREN

Author: *Elena Paškevičiūtė*<sup>1</sup>

Scientific research supervisors: Prof. *Diana Ramašauskaitė*<sup>2</sup>, Dr. *Dalius Baltušnikas*<sup>3</sup>,  
Dr. *Milda Narmontienė*<sup>4</sup>

<sup>1</sup> *Vilnius University, Lithuania*

<sup>2</sup> *Vilnius University, Hospital Santaros klinikos, Lithuania*

<sup>3</sup> *Panevėžys Consultation Polyclinic, Lithuania*

<sup>4</sup> *Kupiškis District Primary Health Care service center, Lithuania*

**Keywords.** Cervix neoplasms; signet ring cell carcinoma; immunohistochemistry; adenocarcinoma.

**Introduction.** Squamous cell carcinoma is the most common cervical tumour type. However, there is an increase in adenocarcinoma incidence in Western European countries, which accounts for about 15-20% of all cervical cancers. Cervical signet-ring carcinoma is an extremely rare type of mucinous adenocarcinoma, with less than 30 cases described in the literature.

**Case Description.** We report a 59-year-old female who presented with diffuse peritonitis, ascites, and an ovarian mass that showed large zones of atypical signet-ring cells on biopsy. The ovarian tumour was positive for homeobox protein CDX-2 and Wilms' tumour protein. Laparoscopy revealed a widely spread metastatic disease (FIGO stage IVB). Biopsy of cervix showed the same morphologic features and was positively stained for p16+ protein, confirming cervical origin of the tumour. Due to diffuse peritonitis and intestinal ischemia, the patient died on the fifth postoperative day.

**Summary.** Primary cervical signet-ring cell carcinoma is an extremely rare morphologic form of cervical cancer. Most commonly it is metastasis of the primary stomach or breast cancer. Tumour of an unknown primary site often poses a difficult diagnostic challenge. In rare cancer case, it would be recommended to analyse reports, previously published in the literature. Differential diagnosis of tumour origin is essential not only in terms of treatment choice but also for prognostic value.

**Conclusion.** Due to its rare primary occurrence in the cervix, no specific immunohistochemical profile, besides the presence of human papillomavirus, has been identified to support the diagnosis with certainty. Therefore when a patient presents with a tumour of an unknown primary site, unusual morphology needs to be appropriately evaluated.



## DIFFERENTIAL DIAGNOSIS BETWEEN DANDY-WALKER SYNDROME AND MEGA CISTERNA MAGNA - A CASE REPORT IN GENERAL PRACTICE

Author: *Anna Marija Prince*<sup>1</sup>

Scientific research supervisors: Dr. *Vija Siliņa*<sup>1</sup>, Dr. *Ilze Jākobsone*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Private Primary Care Practice, Latvia*

**Keywords.** Dandy-Walker syndrome (DWS), mega cisterna magna.

**Introduction.** Dandy-Walker syndrome (DWS) is considered a rare congenital brain malformation. It is not commonly reported from a general practitioner's point of view.

**Case Description.** In 2002 the patient was born with intraventricular haemorrhage II, Apgar score 1/3/5 and was admitted to ICU. Three months after birth parents noticed developmental delay. At the age of 10 months (September 19th, 2003) the patient was diagnosed with periventricular leukomalacia and Dandy-Walker syndrome after brain MRI (Magnetic Resonance Imaging) demonstrated wide posterior fossa with open foramen magnum communicating with the 4th ventricle and hypoplastic vermis cerebelli inferior. The parents and family physician worked on patient's condition with regular physical, occupational and speech therapy sessions. In the September of 2020, the patient received another head MRI, that suggested, that the patient has mega cisterna magna without previously described findings. After thorough investigation diagnosis was made.

**Summary.** Patient started to show signs of neurological disorder soon after birth and was diagnosed with Dandy-Walker syndrome. At the age of 17 another MRI was performed, that concluded that there were no characteristic signs of DWS, but a finding of mega cisterna magna. Clinical presentation supports DWS diagnosis as more likely in this case.

**Conclusion.** Dandy-Walker syndrome is a rare anomaly, and it could be misdiagnosed in people with mega cisterna magna and vice versa especially in patients with perinatal hypoxia. Mega cisterna magna refers to a normal variant, but in this case, patient has severe neurologic deficit, DWS supports the clinical presentation. It is vital for patients with neurologic deficit to receive regular physical, occupational and speech therapy to maintain their health. Uncertainty of diagnosis rises doubts in adequacy of care both in patient's parents and family physician.

## EPIDURAL ANAESTHESIA FOR CAESAREAN DELIVERY IN A PATIENT WITH SARCOIDOSIS INDUCED PULMONARY HYPERTENSION

Author: *Veronika Ribcova*<sup>1</sup>

Scientific research supervisor: Dr. *Marina Šarkele*<sup>2</sup>

<sup>1</sup> *Rīga Stradiņš University, Latvia*

<sup>2</sup> *Pauls Stradiņš Clinical University Hospital, Latvia*

**Keywords.** Sarcoidosis; Pulmonary hypertension; Caesarean section; epidural anaesthesia.

**Introduction.** Pulmonary hypertension (PH) is a progressive disease induced by advanced sarcoidosis which leads to complications during and after surgical procedure and high maternal mortality. The main goal is to inform that anaesthesia for Caesarean section and management of postpartum complications needs to be chosen precisely for patient with PH.

**Case Description.** At 35 weeks' gestational age, a 39-years-old woman arrived to Pauls Stradiņš Clinical University Hospital with diagnosis of sarcoidosis with such symptoms - lower limb edema, acrocyanosis and dyspnea. She was hemodynamically stable. Echocardiography showed elevation of right ventricular systolic pressure to 110 mmHg. The acute Caesarean section with epidural anaesthesia was made on the next day. The combination of Sol. Fentanyl 0.005% 1 ml and Sol. Bupivacaine 0.5% 15 ml was applied as anaesthesia. The surgery led to systemic hypotension. Sol. Noradrenaline 0.1 µg/kg/min was administered to maintain the blood pressure. Newborn was delivered with Apgar score 7/8. However, patient was transferred to Cardiac Intensive Care Unit. The Easypump with Sol. Bupivacaine 0.125% 5 ml/h was used for postoperative analgesia. The next echocardiography showed increase of right ventricular systolic pressure to 120 mmHg. On the third day her overall condition improved therefore she was discharged. On the twelfth day patient was readmitted because of scar dehiscence. Relaparotomy was provided. A pelvic abscess developed. It was drained. Septic shock led to critical condition. Patient died. The cause of death - progressive cardiorespiratory failure.

**Summary.** Epidural anaesthesia is a precise choice for this kind of patients. Postoperative complications need to be considered.

**Conclusion.** Epidural anaesthesia might appear as a precise option to cause less cardiopulmonary compromise in patients with PH. General anaesthesia was not used because it increases pulmonary vascular resistance. Spinal anaesthesia was not used because it decreases systemic vascular resistance. Management of sarcoidosis is immunosuppressive and can cause infection.

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