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## Abstract book



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# PREFACE

Scientific progress is constantly increasing. Each day collective efforts of scientists from all over the world produce novel discoveries or inventions. We are ecstatic that so many young researchers from various biomedical fields contribute their time and energy to this process. This abstract book contains 220 abstracts of authors who have participated at the 3rd International Health Sciences Conference.

The Students' Scientific Society of the Lithuanian University of Health Sciences invites young researchers for the third time to one of the most prominent Eastern European biomedical conferences. We believe the conference continues to grow as an influential event to share discoveries, meet fellow peers from other countries and discuss the latest findings in biomedical fields.

We hope this abstract book will satisfy anyone who is interested in the latest biomedical advancements of the participating countries. We greatly thank everyone who has contributed to the release of this book and the Conference itself.

**The Organising Committee of International Health Sciences Conference**



# **ANAESTHESIOLOGY & INTENSIVE CARE SESSION**

# EFFECT OF LOW – DOSE KETAMINE IN PAIN MANAGEMENT AFTER UROLOGIC ONCOLOGY SURGERY: PILOT STUDY

*Justas Keršulis, Justina Čyžiūtė, Martynas Kekys*

*Supervisor of the abstract: Liuda Brogienė*

*Department of Anesthesiology, Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Lithuania*

## **Introduction**

Low doses of ketamine acts like antagonist of N-methyl D-Aspartate (NMDA) receptors in postsynaptic level and reduces central sensitization in spinal cord. In this way ketamine prevents development of chronic pain. Studies indicate ketamine effects on preventive treatment of acute post-operative pain, neuropathic pain and opioids consumption in oncological patients, but the literature remains controversial.

## **Aim**

to evaluate the influence of preemptive low-dose ketamine use on postoperative pain intensity after urologic oncology surgery and opioid consumption during anesthesia.

## **Objectives**

1. To evaluate and compare a consumption of opioids during general anesthesia between ketamine and control groups.
2. To assess and compare pain intensity between ketamine and control groups after 2, 12, 24, 48 hours after surgery, on the discharge day and after one week.

## **Methods**

In a prospective study there were 27 randomly selected ASA I - III physical status adult patients who were scheduled for urologic oncology surgery (radical prostatectomy, nephrectomy) under general anesthesia. Patients were divided in two groups by „tossing a coin“ method: the ketamine group (group KET, n = 10) received 0,15 mg/kg of ketamine intravenously during induction before incision and the control group (group K, n = 17) that did not receive ketamine. Both groups received standard general anesthesia with sevoflurane, fentanyl, atracurium, also paracetamol and nonsteroidal anti – inflammatory drugs. Postoperative pain was monitored according to a verbal scale (no pain – 0, mild pain – 1, moderate pain – 2, strong pain – 3, very strong pain – 4) 2, 12, 24, 48 hours after surgery, on the discharge day and after 1 week postoperatively. Also, opioid consumption during anesthesia was evaluated. Statistical analysis was performed with SPSS 22.0 program packet (Mann – Whitney U test for quantitative comparison, Fisher`s Exact Test for qualitative comparison).

## **Results**

There were 27 patients in a research, 23 (85%) males and 4 (15%) females. There were 8 (80%) men and 2 (20%) women in KET group, 15 (88,2%) men and 2 (11,8%) women in K group ( $p > 0,05$ ). The age average in KET group was  $63,5 \pm 8,3$  years, in K group  $63,9 \pm 10,7$  years ( $p > 0,05$ ). There were 8 (80%) ASA II class patients and 2 (20%) ASA III class patients in KET group, 13 (76,5%) ASA II class patients and 5 (23,5%) ASA III class patients in K group ( $p > 0,05$ ). In KET group 4 (40%) nephrectomies and 6 (60%) radical prostatectomies, in K group – 8 (47,1%) nephrectomies and 9 (52,9%) radical prostatectomies were performed. Duration of the surgery in the KET group was  $189,4 \pm 55,6$  min., in K group –  $158,8 \pm 43,7$  min. ( $p > 0,05$ ). Ketamine and control groups were homogeneous by age, sex, ASA class, duration and type of the surgery. Fentanyl usage during surgery in KET group was  $-0,45 \pm 0,11$  mg and in K group  $-0,46 \pm 0,11$  mg ( $p > 0,05$ ). In the KET group 2 hours after surgery 20% of patients did not feel any pain, mild pain was referred to 10% and moderate pain to 30% of patients, strong or very strong – 40%. In the K group 23,5% had no pain, mild pain – 17,6%, moderate – 35,3%, strong or very strong – 23,5% ( $p > 0,05$ ). No significant difference was found between groups in pain intensity after 12, 24, 48 hours, on the discharge day and after 1 week postoperatively ( $p > 0,05$ ).

## Conclusions

1. There was no difference of opioid consumption during general anesthesia between KET and K groups.
2. There was no difference of pain intensity between KET and K groups in different moments of time.

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## EVALUATION OF EFFICIENCY AND DEPTH OF DEXMEDETOMIDINE SEDATION UNDER REGIONAL ANAESTHESIA

*Alma Jaunmuktane, Mareks Margaliks*

*Supervisor of the abstract: Biruta Mamaja*

*Department of Anesthesiology and Reanimatology, Riga Stradins University, Latvia*

### Introduction

During regional anaesthesia (RA) patients frequently want to be sedated because of fear, anxiety of the procedure and discomfort from lying on the operating table [1]. In order to reduce the stress of being awake during the procedure sedation is widely used [2]. In clinical practise the newest sedative is Dexmedetomidine with an anxiolytic and analgesic effects, and causes the 'natural sleep' which means patient is easily arousable on verbal stimulation [3, 4

### Aim

To investigate correlation of the efficiency and depth of Dexmedetomidine sedation, parameters of haemodynamic and breathing, and the time and quality of recovery under regional anaesthesia.

### Objectives

1. To evaluate heart rate (HR), non-invasive systolic and diastolic blood pressure (SBP, DBP), respiratory rate (RR) and oxygen saturation (SpO<sub>2</sub>) using sedation with Dexmedetomidine under regional anaesthesia;
2. To continuously measure the depth of sedation with Dexmedetomidine using electroencephalogram (EEG) monitor Narcotrend;
3. To evaluate the efficiency of sedation according to Richmond Agitation Sedation Scale (RASS); 4. To evaluate duration and quality of patients' recovery after sedation;
5. To assess patients' satisfaction with the quality of sleep according to handed out questionnaires.

### Methods

The prospective cohort study involved 32 ASA I-II patients (28 elective, 4 acute) who received sedation with Dexmedetomidine under RA. For plexus brachialis blockade Bupivacaini and Lidocaini, for spinal anaesthesia (SA) Levobupivacaini was given not exceeding the maximum recommended doses. The loading dose of Dexmedetomidine was 1 µg/kg over 10 min followed by a continuous infusion of 0.1-0.6 µg/kg/h until the end of the surgery maintaining the target EEG index 50-70. Standart monitoring was used. The depth of the sedation was measured with **Narcotrend** EEG index (EEG stage A – awake (95-100); B, C – light sedation (65-94); D – moderate sedation (37-64); E, F – deep sedation (<36)). The efficiency of the sedation was measured by RASS. The time and quality of the recovery were evaluated at the end of each surgery. The quality of the sedation of patients was assessed by answers from handed out questionnaires. Assessments were done by one person. Statistical analysis was performed with Microsoft Excel 2010 and SPSS (**Statistical package for social sciences**) 20. Data was evaluated with ANOVA (**Analysis of variance**) and Student's t-test. Results with values of  $p < 0.05$  were considered statistically significant.

## Results

14/32 patients were women, 18/32 men, aged between 20 and 74. Types of RA used: 24/32 had a plexus brachialis block (75.0%) – reconstructive surgeries in hand, 5/32 had SA (15.6%) – reconstructive surgeries in leg, 3/32 had SA with plexus block (9.4%) – free flap microvascular surgery. The mean duration of surgery was  $89.38 \pm 67.46$  min, mean duration of sedation  $102.81 \pm 67.52$  min. After the Dexmedetomidine loading dose HR decreased by  $8.44 \pm 7.16$  x/min ( $p = 0.000$ ), SBP decreased by  $7.31 \pm 12.03$  mmHg ( $p = 0.002$ ), DBP decreased by  $4.75 \pm 7.15$  mmHg ( $p = 0.001$ ). 2/32 patients (6.3%) had a bradycardia below 50 x/min requiring a single minimum dose of Atropine, 5/32 patients (15.6%) had a temporary bradycardia that does not require treatment and in 25/32 cases (78.1%) sedation did not cause bradycardia. After loading dose bradycardia did not appear in any of the patients while EEG index was 20-80, and HR was similar in all three RA groups. Sedation caused neither of the following: hypotension, the need to stop the continuous infusion or add other sedatives. After the loading dose SpO<sub>2</sub> level decreased by  $1.28 \pm 2.37\%$  ( $p = 0.005$ ) without the need to use assisted ventilation or any airway device. All patients had adequate spontaneous breathing during their sedation. Mean EEG index was  $96.5 \pm 3.8$  before and decreased by  $19.72 \pm 23.85$  ( $p = 0.000$ ) after loading dose. During sedation mean EEG index was  $68.53 \pm 21.70$ , the mean lowest recorded was  $53.10 \pm 25.00$  after 30 min. According to RASS the level of sedation was from 0 to -3. Increased noise levels rose the EEG index during surgery, the patient woke up and then quickly fell back asleep. At the end of the surgery all patients were promptly arousable with verbal stimulation without impaired cognitive abilities and psychomotor functions. According to answers from their questionnaires all patients were satisfied with the sedation they received.

## Conclusions

1. After the loading dose of Dexmedetomidine of  $1\mu\text{g}/\text{kg}$  over 10 min bradycardia did not appear while Narcotrend electroencephalogram index was 20-80, and heart rate was similar in all three regional anaesthesia groups, all patients maintained spontaneous breathing and sedation did not cause any significant haemodynamic instability.
2. The loading dose of Dexmedetomidine of  $1\mu\text{g}/\text{kg}$  over 10 min and a continuous infusion of  $0.1\text{-}0.6\ \mu\text{g}/\text{kg}/\text{h}$  provides sufficient sedation efficiency according to Narcotrend electroencephalogram index 50-70 during reconstructive surgery under regional anaesthesia.
3. According to Richmond Agitation Sedation Scale the level of sedation during surgery was from 0 to -3.
4. Dexmedetomidine sedation under regional anaesthesia provides fast and good quality of recovery.
5. Dexmedetomidine sedation under regional anaesthesia ensures a high patient satisfaction rate of sleep quality.

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## EVALUATION OF PRE-DELIRIC (PREDICTION OF DELIRIUM IN ICU PATIENTS) DELIRIUM PREDICTION MODEL FOR PATIENTS IN INTENSIVE CARE

Gabrielė Linkaitė, Ignė Bunevičiūtė, Mantas Riauka  
Supervisor of the abstract: Saulius Vosylius  
Vilnius University, Lithuania

## Introduction

Delirium is a common problem in the intensive care unit (ICU) occurring in 11%-80%[1] of critically ill patients. Not

only does it compromise patient care, but it is also associated with poorer outcomes[2-4] such as increased duration of mechanical ventilation, longer length of stay in the ICU and hospital, increased costs, higher mortality and greater long-term cognitive dysfunction. CAM-ICU[5-6] is a short algorithmic method used to easily recognise delirium in the ICU in order to hasten targeted therapy. Preventive measures and risk factors have also been thoroughly studied[7-9]. Pre-deliric model[10] is a tool used to calculate the risk of a patient to develop delirium during hospital stay based on known risk factors gathered on the first day of hospitalisation. The identification of high-risk patients allows early initiation of preventive measures.

### **Aim**

Our aim was to evaluate the Pre-deliric model in Lithuanian ICU patients using the CAM-ICU method for diagnosis of delirium.

### **Objectives**

The first objective was to prospectively collect ICU patient data for one month in order to calculate APACHE-II and Pre-deliric scores. Evaluation of patients using the CAM-ICU method was to be performed at the same time everyday once-daily. The second objective was to continue evaluating patients included in the previous month with the CAM-ICU for one week. The last objective was statistical analysis of data with emphasis on the ROC curve results.

### **Methods**

Patients admitted to 40 beds ICU in the Republic University Hospital of Vilnius during the month of February 2015 were included in the study. Every day at 12:00-15:00 data was collected for APACHE-II and Pre-deliric scores. Patients were evaluated once-daily using the CAM-ICU method. We defined patients as having delirium when they had at least one positive CAM-ICU screening or were treated by haloperidol for delirium. Additionally information on patient's age, sex, sedation, days on mechanical ventilation, days in the ICU and death was collected. Patients were excluded if they had a persistent Richmond agitation sedation score (RASS) of -3/-4/-5, had serious receptive aphasia or mental disability, were unable to understand Lithuanian, had a history of drug or alcohol abuse, stayed in the ICU for less than 24 hours. Patients included in February were further evaluated with the CAM-ICU during the first week of March. Statistical analysis was done using SPSS v19. We divided groups into patients positive and negative for delirium. To validate the Pre-deliric model we calculated the area under receiver operating characteristic (AUROC) curve. To compare differences among groups we used the Independent-Samples T-test and Chi-Square test appropriately.

### **Results**

38(23%) out of 167 patients were included in the study. Main reasons for exclusion were ICU stay <1 day (30%), alcohol abuse (13%), persistently low RASS score (11%). Patient mean age: 69,16 ± 17,24 (22-95); 19(50%) male; APACHE-II mean score 17,95 ± 7,35 (range 4-39). Patient categories for admission to the ICU were 9(24%) surgery, 6(16%) medical, 6(16%) trauma, 17(45%) neurology/neurosurgery. Overall 21(55%) had surgery 1 day prior or during ICU stay. Delirium developed in 22(58%) patients, 8(36%) had hyperactive delirium, 12(55%) – hypoactive, 2(9%) – mixed. 6 of 10 patients with hyperactive or mixed delirium received Haloperidol. Median days to onset of delirium was 1 (range 1-10). Delirium was associated with more frequent intubation (19 vs. 3 intubated,  $p < 0,05$ ). Finally, delirium diagnosis and pre-deliric scores were used to generate the ROC curve resulting in the area under the curve of 0.716 ( $p < 0.05$ , 95% CI 0.544-0.888); sensitivity and specificity for patients with 20% risk were accordingly 96% and 25%, 40% risk – 77% and 56%, 60% risk – 68% and 69%. Length of stay in the ICU, APACHE II scores, days with sedation, days on the ventilator and mortality were not significantly different among groups.

### **Conclusions**

The Pre-deliric model can fairly predict delirium for the complete stay in the ICU within 24 hours of admission. This study proves that the Pre-deliric model used alongside CAM-ICU is applicable for our patients. Subsequent preventive therapy can now be efficiently targeted to high risk patients if both of the methods are to be implemented.

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## IMPACT OF COMBINED ANAESTHESIA ON COGNITIVE FUNCTIONS OF PATIENTS AFTER CARDIAC SURGERY

*Petras Petkevicius, Greta Kasputyte*

*Supervisor of the abstract: Rasa Andriusyte, Tadas Lenkutis, Edmundas Sirvinskas  
Department of Anesthesiology, LSMU, Lithuania*

### Introduction

Patient's quality of life after surgical treatment is measured by the absence of postoperative complications and mortality rates. Recovery after cardiac surgery is often complicated by various neuropsychological complications, such as memory, attention, concentration and learning deficit. The incidence of cognitive decline occurs in 53% of patients after cardiac surgery.[1] These complications could be related to neurotoxic effects of general anaesthetics. Although the fact that neuropsychological complications are less common in patients undergoing combined (general + epidural) anaesthesia than in patients undergoing general anaesthesia is not yet confirmed, results are discussed.[2]

### Aim

To determine the impact of combined anaesthesia (general + thoracic epidural) on cognitive functions of patients after cardiac surgery.

### Objectives

- 1) To determine the difference of preoperative cognitive function test results, cardiac surgery factors between combined anaesthesia and general anaesthesia group patients.
- 2) To determine the difference of postoperative cognitive function test results between combined anaesthesia and general anaesthesia group patients.
- 3) To determine the difference of cognitive dysfunction rate between combined anaesthesia and general anaesthesia group patients.

### Methods

Prospective case-control study included 50 patients undergoing cardiac surgery December 1, 2014 - March 10, 2015 at Clinic of Cardiac, Vascular and Thoracic Surgery, Lithuanian University of Health Sciences. After approval from LSMU Bioethics Centre informed consent was obtained from all study participants. Inclusion criteria were: 1) age 55-80

years; 2) planned CABG, valve or combined on-pump cardiac surgery; 3) cardiac output > 35%; 4) no anamnesis of agents affecting CNS; 5) no neuropathology; 6) no renal failure. Inclusion criteria were assessed a day before the surgery. Exclusion criteria were: 1) rejection to participate in study; 2) patients, who did not fit inclusion criteria. MMSE test and 6-CIT test were used for a cognitive function assessment a day before surgery and 7 days after surgery. Trail making test (Trail) and WAIS Digital Symbol Substitution Test (WAIS) were used for a psychomotor function assessment a day before surgery and 7 days after surgery.

According to the planned anaesthesia, patients were assigned into 2 groups: 1) combined (general + thoracic epidural); 2) general anaesthesia. Anaesthesia was administered according to standardized protocol. Groups were compared with the respect to: preoperative factors (gender, age, education, type of surgery); preoperative neuropsychological tests results (pre-MMSE, pre-6-CIT, pre-Trail, pre-WAIS); surgery factors (time of cardiopulmonary bypass - CPB, aorta cross-clamp time - AoCC, duration of anaesthesia, duration of ICU stay, fluid balance, length of mechanical ventilation after the surgery); postoperative neuropsychological tests results (post-MMSE, post-6-CIT, post-Trail, post-WAIS).

Mann-Whitney U Test was performed for comparisons within groups. Multiple logistic regression analysis was performed to count odds ratio. Statistical analysis was performed using SPSS 21.0.  $P < 0.05$  was regarded as statistically significant.

## Results

Mean age of patients was  $66 \pm 7$  years, 38% (19) were women and 62% (31) were men. There were 44% (22) and of 56% (28) cases in combined anaesthesia and general anaesthesia groups respectively. According to age, gender, education and type of surgery groups did not differ between each other ( $p > 0.05$ ).

Means of pre-MMSE, pre-6-CIT, pre-Trail, pre-WAIS results did not differ between combined anaesthesia and general anaesthesia groups: pre-MMSE  $28 \pm 1$ ; pre-6-CIT  $4 \pm 4$ ; pre-Trail  $54.3 \pm 17.9$  sec.; pre-WAIS  $22 \pm 6$  symbols in combined anaesthesia versus pre-MMSE  $26 \pm 3$ ; pre-6-CIT  $6 \pm 5$ ; pre-Trail  $82.7 \pm 33.5$  sec.; pre-WAIS  $18 \pm 7$  symbols in general anaesthesia groups ( $p > 0.05$ ). Difference of cardiac surgery factors was not statistically significant between combined anaesthesia and general anaesthesia groups: CBP  $94.3 \pm 22.8$  min.; AoCC  $53.5 \pm 21.6$  min.; anaesthesia  $256.1 \pm 28.7$  min.; ICU  $69.8 \pm 25.5$  h; fluid balance  $1397 \pm 615$  ml in combined anaesthesia versus CBP  $85.6 \pm 18.1$  min.; AoCC  $44.3 \pm 15.1$  min.; duration of anaesthesia  $249.3 \pm 59.2$  min.; ICU  $74.6 \pm 34.2$  h; fluid balance  $1814 \pm 890$  ml in general anaesthesia group respectively ( $p > 0.05$ ).

Length of mechanical ventilation was  $2.8 \pm 3.4$  h and  $10 \pm 8.3$  h in combined epidural anaesthesia and general anaesthesia groups respectively ( $p = 0.001$ ). Odds ratio of mechanical ventilation length in regression analysis is 0.69 ( $p = 0.001$ ; 95% CI 0.55 - 0.86) higher in general anaesthesia group.

Results of post-MMSE, post-6-CIT results did not differ statistically significantly in both, combined and general anaesthesia, groups: post-MMSE  $28 \pm 2$ ; post-6-CIT  $4 \pm 4$  in combined anaesthesia versus post-MMSE  $26 \pm 3$ ; post-6-CIT  $6 \pm 5$ ; s in general anaesthesia groups ( $p > 0.05$ ). Mean of post-Trail was  $60 \pm 20.1$  sec. and post-WAIS  $20 \pm 6$  symbols in combined anaesthesia versus post-Trail  $77.5 \pm 34$  sec. and post-WAIS  $16 \pm 6$  symbols in general anaesthesia groups respectively ( $p < 0.05$ ).

The rate of cognitive dysfunction was 9.1% versus 3.6% of cases in combined anaesthesia and general anaesthesia groups respectively ( $p > 0.05$ ).

## Conclusions

1) Cognitive function test results are the same between combined anaesthesia and general anaesthesia group patients. Length of mechanical ventilation is much shorter for patients undergoing combined anaesthesia. Other cardiac surgery factors are the same among groups.

2) Recovery of cognitive functions is better for patients undergoing combined anaesthesia.

3) The rate of cognitive dysfunction is the same in both, combined anaesthesia and general anaesthesia, groups.

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## IMPACT OF INTRA-AORTIC BALLOON PUMP ON CEREBRAL OXYGENATION IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING SURGERY

*Greta Ramanauskaitė, Akvilė Sabestinaitė*

*Supervisor of the abstract: Robertas Samalavičius*

*Vilnius University, Faculty of Medicine, Lithuania*

### Introduction

Even lower decrease in cerebral saturation in patients undergoing cardiac surgery was recently associated with adverse outcomes [1], especially with neurological deficits.

### Aim

We aimed to evaluate the impact of prophylactic intraaortic balloon pump (IABP) on cerebral oxygenation in high risk coronary artery bypass grafting surgery (CABG) patients.

### Objectives

1. To assess cerebral oxygenation between the high risk and control groups.
2. To evaluate the impact of prophylactic IABP on cerebral oxygenation in high risk CABG patients.
3. To ascertain more differences between two groups which determined results of our research [2].

### Methods

This was a single-centre retrospective study. Data of patients who were operated during a 20 month period and monitored with Invos cerebral oximeter were reviewed. Patients were divided into two groups – high risk (left ventricular ejection fraction (LVEF) < 30% or LVEF < 40% with any one of the following: left main stem disease, unstable angina or redo surgery) and control (LVEF > 30% or LVEF > 40% without any diseases which determine high risk group). For high risk patients an IABP was placed before surgery in the operating room. During cardiopulmonary bypass (CPB), IABP was set on automatic 80 beats/min rate to induce pulsatile flow. For control group IABP was not placed. Patients who needed IABP treatment in the pre-operative period were excluded from the analysis. Regional cerebral oxygen saturation (rSO<sub>2</sub>) was monitored bilaterally in all patients. The SPSS programme was used to count differences of cerebral oxygenation and other various factors that describe groups, using parametric tests: crosstabs, independent samples t-test and non parametric independent samples Mann-Whitney U test.

### Results

Data of 134 patients were analysed. Forty four patients were high risk. They had lower baseline oxygenation (left hemisphere (hem.) P = 0.001, right hem. P = 0.002) than control group patients. Desaturation (absolute rSO<sub>2</sub> less than 50% or 20% lower than baseline) occurred in 21 (48%) high risk patients and in 44 (48%) patients in the control group. However, at the majority of stages during surgery the decline from baseline was lower in IABP treated patient group: during incision (left hem. P = 0.07, right hem. P = 0.038); starting of CPB (left hem. P < 0.001, right hem. P = 0.003); closing sternum (left hem. P < 0.001, right hem. P = 0.001).

## Conclusions

Prophylactic use of IABP was associated with a lower decline of oxygen saturation during on-pump CABG surgery. A large prospective randomized study in this regard is needed.

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## INFLUENCE OF PLASMA FIBRINOGEN LEVEL ON POSTOPERATIVE BLEEDING IN PATIENTS ON ASPIRIN THERAPY AFTER ON-PUMP CARDIAC SURGERY

*Vita Biltauere, Agnese Ozolina, Eva Strike, Vladimirs Harlamovs, Marite Daukste*  
*Supervisor of the abstract: Agnese Ozolina*  
*Riga Stradins University / Pauls Stradins Clinical University Hospital, Latvia*

### Introduction

Aspirin is an antiaggregant which permanently inhibits platelet aggregation by blockading synthesis of thromboxane A<sub>2</sub>. Perioperative evaluation of the influence of aspirin continuation or cessation on bleeding still has disclosed controversial results. We speculate if higher fibrinogen plasma levels may improve aggregation process, consequently, decrease amount of blood loss in patients on an aspirin regimen.

### Aim

Goal of study was to determine influence of fibrinogen plasma level on postoperative bleeding in patients on preoperative aspirin therapy after on-pump cardiac surgery.

### Objectives

1. Assess the influence of Aspirin therapy on the amount of postoperative blood loss;
2. Determine plasma fibrinogen level correlation with the amount of postoperative blood loss;
3. Identify critical plasma fibrinogen level in patients with preoperative Aspirin therapy after cardiopulmonary bypass;
4. Analyse the influence of cryoprecipitate transfusions on postoperative plasma fibrinogen level and the amount of blood loss.

### Methods

In the prospective study 56 patients with EuroSCORE II < 10% undergoing on-pump cardiac surgery were included. The patients were stratified according whether they received 100 mg aspirin daily less than five days till the surgery (aspirin group, n = 21) or they were not taking aspirin at least five days prior surgery (non-aspirin group, n = 35). Fibrinogen plasma level was detected using method of Clauss preoperatively and 12 hours (h) after surgery. Blood loss (ml) was measured from chest tube drainage (CTD) system 12 and 24 h postoperatively. Comparison analysis was

performed between aspirin and non-aspirin groups, regarding on fibrinogen level in association with postoperative bleeding. Data statistical analysis was carried out by Statistical Package for the Social Sciences (SPSS® 20.0).

## Results

Tendency for greater bleeding was observed in an aspirin group  $518 \pm 294$  vs  $432 \pm 244$  ml/24h comparing to non-aspirin group ( $p = 0.2$ ). Fibrinogen plasma level on baseline was consistent in both groups  $3.3 \pm 0.6$  g/L in aspirin and  $3.3 \pm 0.7$  g/L in non-aspirin group ( $p = 0.8$ ). After cardiopulmonary bypass (CPB) cryoprecipitate (CRYO) received 11 (31%) patients in non-aspirin and 11 (52%) patients in aspirin group ( $p = 0.1$ ), the latter who received CRYO demonstrated statistically lower bleeding volume after surgery  $246 \pm 99$  vs.  $457 \pm 266$  ml/12h ( $p = 0.02$ ). Only in aspirin group postoperative plasma fibrinogen level showed significant negative correlation with 24 h blood loss ( $r = -0.5$ ;  $p = 0.02$ ). Moreover, greater blood loss was noticed in aspirin group for those who had fibrinogen level  $\leq 3$  g/L after surgery,  $510 \pm 288$  vs  $265 \pm 119$  ( $p = 0.002$ ), respectively.

## Conclusions

1. Aspirin therapy till the day of surgery promotes higher postoperative bleeding volume, especially, if Aspirin therapy is discontinued less than 3 days before surgery.
2. Postoperative plasma fibrinogen level negatively correlates ( $p = 0,007$ ) with the postoperative amount of blood loss, thereby confirming the important role of fibrinogen in hemostasis.
3. Identified critical plasma fibrinogen concentration in patients with Aspirin therapy is  $\leq 3$  g/L. Lower plasma fibrinogen levels significantly increases the risk of postoperative blood loss  $> 500$  ml, especially in patients with Aspirin therapy.
4. Perioperative cryoprecipitate transfusions increases the level of postoperative plasma fibrinogen and reduces postoperative bleeding volume in patients with Aspirin therapy.

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## MAKING OF ANATOMICAL TRAINER FOR BRONCHOSCOPY

*Aistė Montvilaitė, Airida Narkutė, Ramunė Jakubauskaitė*  
*Supervisor of the abstract: Andrius Macas, Dalia Bieliauskaitė*  
*Department of Anesthesiology, LSMU, Lithuania*

### Introduction

Fiberoptic bronchoscopy is a valuable diagnostic and therapeutical method in anesthesiology and intensive care units. Anatomical knowledge and motor skills are essential to perform this procedure. The latter as well as confidence are hard to obtain due to lack of patients and previous training. Commercial trainers for bronchoscopy are useful for

acquiring psychomotor skills, dexterity and eye-hand coordination but the cost is a limiting factor of accessibility there.

### **Aim**

Our aim was to make a real-size anatomical model of tracheobronchial tree and investigate its suitability for bronchoscopy training.

### **Objectives**

- 1.To make anatomically correct tracheobronchial tree from wire, paper, glue and paint using papier-mâché technique.
- 2.To evaluate experts' opinion about similarity between our model and real human anatomy.
- 3.To evaluate experts' opinion about this model and its benefits and drawbacks in bronchoscopy training.

### **Methods**

A qualitative research was carried out. We made a model of tracheobronchial tree based on anatomy textbooks and article by S. Di Domenico. It took 11 hours (excluding drying time) to make anatomical model. We performed fiberoptic bronchoscopy using this model and took photos from several sites inside it. We put 3 photos from the inside of our model next to a real human bronchoscopy photos. 8 experts took the semi-structured interview about benefits and drawbacks of students' made model. The experts were certified, undergone additional CEEA (Committee for European Education in Anaesthesiology) training anaesthesiologists (with more than 3 years of work experience in bronchoscopy). The results were summarized using a qualitative research methodology.

### **Results**

The model had exact number of bronchi up to segmental bronchi based on Franc H. Netter "Atlas of Human Anatomy". We counted experts' answers about similarity to real human anatomy. The answer "completely similar" got 7, "similar"-17 votes. None of the photos were thought to be "completely dissimilar" to real human anatomy photos. All experts agreed that anatomical models are necessary for training and would be worth the time spent while making them. However, one of them preferred models to be manufactured and stated that making models are beneficial only for students who make them. The experts expressed similar views on benefits of this model: it is simple and valuable for repeating anatomy, students must have gained good understanding of tracheobronchial tree. Three experts thought that it would be good for practice and gaining motor skills before seeing a real patient because of unlimited practice time and possibility to repeat the procedure until the desirable result is reached. One expert emphasized low economical expenses. On the other hand, one expert stated that such model might be short-lived, others were concerned that color and texture, lack of cartilage rings might reduce resemblance to real anatomy. One expert suggested that such model should include all anatomical structures passed by the bronchoscope to reach the bronchi. The other expert thought that more advantages and disadvantages could be revealed when putting the model into practice.

### **Conclusions**

- 1.Our model was anatomically correct and made from easily accessible materials.
- 2.Vast majority of the experts thought that our model was similar to real human anatomy.
- 3.The experts had various opinions on benefits and drawbacks of the model. They agreed that such models are valuable and worth making, and practicing before real procedure helps to develop necessary skills. However, the experts were concerned about the lack of anatomical features that would make this model look more like a real tracheobronchial tree.

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# POSTOPERATIVE QUALITY OF RECOVERY SCALE IN CARDIAC SURGERY

*Kęstutis Petniūnas, Greta Kasputytė, Ieva Zujūtė*

*Supervisor of the abstract: David Gelman*

*Department of Cardiac, Thoracic and Vascular Surgery, LSMU, Lithuania*

## **Introduction**

The patient's ability to resume normal activities postoperatively is an important indicator of successful surgery and anesthesia. [1] Rapid development in anesthesia science and declining rate of perioperative mortality and morbidity, led to a situation where evaluating outcomes becomes a problem. [2] Hence it became crucial to assess quality of the recovery after surgery and anesthesia from the patient perspective and to identify patients-centered outcomes which would be evaluated in multiple domains and extended beyond the immediate recovery period. [3] However there are limited approved postoperative recovery evaluation scales which would help to identify long-term effect of anesthesia and surgery and would be convenient, time efficient tool and suitable for the research. [1] [4] We aimed to evaluate the feasibility of Postoperative Quality of Recovery Scale (PQRS) in on-pump cardiac surgery and to determine relevant points in the perioperative timeline for early, late and long-term recovery assessment.

## **Aim**

We aimed to evaluate the feasibility of Postoperative Quality of Recovery Scale (PQRS) in on-pump cardiac surgery and to determine relevant points in perioperative timeline for early, late and long-term recovery assessment.

## **Objectives**

1. To assess global recovery of patients on the 1st, 7th and 30th day after surgery.
2. To evaluate recovery in the following domains: physiological, nociceptive, emotive, activities of daily living and cognitive recovery. on the 1st, 7th and 30th day after surgery.
3. To compare objective recovery of cognitive functions with subjective patient's self-assessment.
4. To determine relevant timepoints for recovery assessment after cardiac surgery.

## **Methods**

An observational prospective study included 66 patients undergoing elective on-pump cardiac surgery under general anesthesia in Department of Cardiothoracic and Vascular Surgery of Hospital of Lithuanian University of Health Sciences. We used the original Postoperative Quality Recovery Scale which was back translated into Lithuanian language and was approved by the local ethics committee. Patients were questioned verbally in hospital and afterwards they were reached via phone call. The questionnaire is divided into six domains: physiologic, nociceptive, emotive, activities of daily living, cognitive, and overall patient perspective. Given the nature of on-pump cardiac surgery (i.e. usual need of prolonged mechanical ventilation postoperatively) assessment time points were chosen as follows: baseline - on a day before surgery, immediate - not assessed, early - 24 hours after surgery with most patients extubated but all them still in ICU, late - 7 days after surgery with most patients out of ICU but still in hospital and long term - 1 month after surgery with most patients have completed ambulatory rehabilitation program. Recovery was defined as return to baseline values or better.

## **Results**

1. The study included 66 patients, 49 men and 17 women. The average age among men,  $62.69 \pm 7.03$ , women -  $64 \pm 6.08$ . The oldest patients were among women and men was 74 years old, the youngest 53 and 44 respectively. 24 hours after surgery recovered 1 patient (1.5%), after 7 days - 17 (25.8%), after month - 25 patients (37.9%).
2. Evaluating patients recovery by separate domains after 24 hours: by physiological domain recovered 45 patients (68.2%), nociceptive - 26 (39.4%), emotive, cognitive and daily activities - 28 patients (42.4%). After 7 days: by physiological domain recovered 52 patients (78.8%), nociceptive - 31 (47%), emotive - 43 (65.2%), daily activities - 44 (66.7%), cognitive - 35 (53%). After 30 days: by nociceptive domain of 36 (54.5%), emotive - 44 (66.7%), daily activities

- 48 (72.7%), cognitive -37 (56.1%).

3. After a month 49.9% (31) of the patients did not notice memory or mental abilities changes, but 19.3% (6) of the patients has not recovered by the cognitive domain. Among recovered patients by the cognitive domain 18.9% (7) of the patients considered that their mental abilities are affected by the operation.

### Conclusions

1. Following one month after elective on-pump cardiac surgery more than half of the patients did not return to the preoperative state.
2. Worst results and progress were observed in nociceptive and cognitive domains.
3. We observed that subjective patients opinion about their cognitive function did not match with Postoperative Quality of Recovery Scale results.
4. Our chosen time points allowed assessing recovery in continuous manner and reflected crucial points in postoperative period of cardiac surgery.

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## POST-SURGICAL ANALGESIA COMPARISON AFTER REMOVAL SURGERY OF IMPACTED TEETH BY DIFFERENT ANESTHETIC METHODS

*Domas Kondrotas, Ugne Dobrovolskytė*

*Supervisor of the abstract: Lina Kalibatiene*

*Department of maxillofacial surgery, Lithuanian University of Health Sciences hospital, Lithuania*

### Introduction

Impacted teeth are those teeth that are completely formed but not sprouted for various reasons. This occurrence can happen due to various reasons. Most often it's because the teeth are formed in incorrect position, which prevents them from sprouting. This pathology develops inflammation of soft tissues, prevents other permanent teeth of sprouting and they are often damaged by decay. Removal surgery of not sprouted teeth is usually recommended to avoid these complications. Therefore, in order to choose the optimal treatment and achieve the lowest risk of complications, it is important to choose the method of anesthesia properly.

### Aim

To find out side effects of removal surgery of impacted teeth by different anesthetic methods.

### Objectives

1. To evaluate the problems faced by patients during the postoperative period after removal surgery of impacted teeth.
2. To compare patients' well-being after impacted teeth removal surgery with the use of different methods of anesthesia.

3. Compare the intensity of pain between men and women during the impacted teeth removal surgery with the use of different methods of anesthesia.

### Methods

A Retrospective study performed by “Lithuanian University of Health Sciences hospital, department of maxillofacial surgery”. The study included all patients who received impacted teeth removal surgery at Lithuanian University of Health Sciences hospital on 2015 January – March. In the survey was asked about the pain and side effects after one to three days after the surgery. The study included 50 patients: 33 (66%) women and 17 (34%) men. Average age – 25 years old,  $\pm$  5,9 years. Patients were divided into two groups according to the applied anesthesia during surgery. The first group received generic endotracheal anesthesia (N = 13) and the second group – wired anesthesia with sedation (n = 37). Statistical analysis of data was performed using software called SPSS 20.0. Parametric criteria were evaluated by using Student's t test, nonparametric -  $\chi^2$  and Mann-Whitney test. Logistic regression analysis used for risk factors assessment . The data is expressed by average value and standard deviation. Statistically significant level of  $p < 0.05$ .

### Results

The study included 50 patients: 33 (66%) women and 17 (34%) men. Average age – 25 years old,  $\pm$  5,9 years. The first group received generic endotracheal anesthesia (N = 13) and the second group – wired anesthesia with sedation (n = 37). 18% of respondents felt very good before the surgery, 64% - well, 18% - decent. Meanwhile, results after the surgery were: 18% - very good, 60% - good, 20% - decent, 2% - bad. The assessment of pain intensity after the surgery (from one to ten), using verbal pain scale, it was observed that endotracheal surgery patients experience more pain (5 points) than wired anesthesia with sedation (4 points). ( $P > 0.05$ ). 90.9% said that pain was enhanced by physical factors (movement, touch, pressure), 2.3% - emotional factors (stress, negative emotions, depression), 6.8% - environmental factors (temperature, pressure). It is observed that after not sprouted teeth removal surgery, 40% of patients were complaining about of-lasting, biting, blunt pain; 24% - pain by the waves, pulsating. 12% of stinging, stabbing pain. 24% of patients complained about other types of pain. Compared manifested side effects between endotracheal anesthesia (54% - soaring throat, 23.1% - sputum production, 46.2% - dry mouth, 15.4% - nausea, 53.8% - thirst, 0.0% - hiccups, 30.8% - loss of appetite, 23.1% - increased appetite) and wired anesthesia with sedation (51.4% - soaring throat, 27.0% - sputum production, 48.6% - dry mouth, 13.5% - nausea, 37.8% - thirst, 8.1% -hiccups , 27.0% - loss of appetite, 5.4% -increased appetite) was not statistically significant difference. Evaluating the results by sex, it was observed that women were frequently reported with side effects such as nausea (female – 18.2%, male - 5.9%), dry mouth (51.5% - female, 41.2% = male), while men were frequently reported with sputum production (35.3% - male, 21,2% - female) 95% of respondents were satisfied with the method of anesthesia during the surgery.

### Conclusions

1. A comparison of post-surgery pain intensity in not sprouted teeth removal surgeries revealed that the chosen method of anesthesia does not affect the strength of postoperative pain.
2. The study revealed that there is no statistically significant dependency between women and men pain intensity after sprouted teeth removal surgery.
3. No statistically significant dependency between the anesthetic technique and the side effects were observed ( $\chi^2 = 0.028$ ;  $p > 0.05$ ).

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## STAPHYLOCOCCUS AUREUS COLONIZATION COMPARISON BETWEEN HEALTHY POPULATION AND PEOPLE TREATED IN INTENSIVE CARE UNIT

*Kęstutis Petniūnas, Vidas Vainauskas, Inesa Anulytė*

*Supervisor of the abstract: Alvydas Pavilionis*

*Institute of Microbiology and Virology, LSMU, Lithuania*

### Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a major pathogen responsible for uncontrollable infectious disease in hospital and community [1,2]. Patients screening for colonization with MRSA are important tool to limit the spread of this organism as well as effective infection control measures, and rational antibiotic use [2,3].

### Aim

To evaluate and compare *Staphylococcus* spp. colonization among healthy control group and critically ill patients.

### Objectives

1. To identify *S. aureus* colonization between healthy and critically ill patients and compare drug resistance between groups.
2. To identify MRSA and compare cases frequency between groups.
3. To compare coagulase-negative *Staphylococcus* (CNS) drug resistance between groups.

### Methods

Ethical approval No BEC-MF-50 was provided by LSMU Bioethics Center on 2014 October 7th. Prospective biomedical research was carried during 2014 and 2015 in which 100 microbiological specimens were taken from 100 patients, treated in LSMUH KK Neurosurgery Intensive Care Unit (ICU) and were compared with specimens taken from 100 healthy adults chosen by accident. We did not find statistically significant difference between ICU patients and healthy control group according to age or gender (mean age 59,83 ± 15,43 versus 52,4 ± 11,32, male 54 versus 59 and female 46 versus 41). Microbiological specimens were taken from nostrils into universal Amies transport media (Copan, Italy). Bacteriological research was carried out at the LSMU VA VF Institute of Microbiology and Virology. Microbiological specimens cultivated in mannitol salt agar (Oxoid). *Staphylococcus* strains were identified on the basis of the division of mannitol, plasma coagulase and latex agglutination test (Oxoid). Resistance to antibiotics (penicillin, oxacillin, vancomycin, erythromycin, cefoxitin, tetracycline, gentamicin, rifampin, fusidic acid, ciprofloxacin, chloramphenicol) determined by the agar disk diffusion method (Kirby-Bauer) Muller-Hinton agar (Appl.Chem GmbH), and determining susceptibility according to EUCAST recommendations [1]. Patients with anterior or posterior nasal packing were excluded.

Statistical analysis was performed using SPSS 22 software package. Mann-Whitney, chi-square tests and Spearman's rank correlation coefficient (rho) was used to find differences between groups. The results was considered significant when  $p < 0.05$ .

### Results

1. From 200 specimens taken we isolated 254 *Staphylococcus* spp. No growth was observed in 4 specimens, 47 had more than one *Staphylococcus* spp. and 5 had 3 *Staphylococcus* spp. strains. 8 had *S. aureus* and other CNS. We identified 15.4% (39) *S. aureus*. 69.2% (27) *S. aureus* where from ICU patients (ICUP) and 30.8% (12) from healthy control group (HCG). 79.5% (31) of *S. aureus* was resistant to penicillin (ICUP - 85.2%, HCG - 66.7%), 25.6% (10) methicillin resistant *S. aureus* (MRSA) (ICUP - 33.3%, HCG - 8.3%), 15.4% (6) erythromycin (ICUP-11.1%, HCG-25%),

5.1% (2) ceftazidime (ICUP - 7.4%, HCG - 0%), 5.1% (2) tetracycline (ICUP - 3.7%, HCG - 8.3%), 15.4% (6) gentamicin (ICUP - 11.1%, HCG - 25%), 2.6% (1) rifampicin (ICUP - 3.7%, HCG - 0%), 2.6% (1) fusidic acid (ICUP - 3.7%, HCG - 0%), 10% (4) ciprofloxacin (ICUP - 11.1%, HCG - 8.3%), 2.6% (1) chloramphenicol (ICUP - 3.7%, HCG - 0%). All *S. aureus* were sensitive to vancomycin. *S. aureus* was 2.25 times more frequent among ICUP than in HCG, Spearman's rho 0.226,  $p < 0.01$ .

2. We observed 10 specimens with MRSA. Overall 33.3% (9) in ICU and 8.3% (1) in healthy control group. However there was not statistically significant difference in resistance to methicillin between groups.

3. Over all we isolated 215 coagulase-negative Staphylococcus (CNS) in our studie (ICUP - 82, HCG - 133). CNS colonized critically ill patients equally as healthy control group. 19.5% (42) CNS were resistant to penicillin (ICUP - 29.3%, HCG - 13.5%), 11.6% (25) oxacillin resistant (ICUP - 22%, HCG - 5.3%), 23.3% (50) erythromycin (ICUP - 20.7%, HCG - 24.8%), 5.6% (12) ceftazidime (ICUP - 11%, HCG - 2.3%), 13.5% (29) tetracycline (ICUP - 26.8%, HCG - 5.3%), 9.8% (21) gentamicin (ICUP - 19.5%, HCG - 3.8%), 0.5% (1) rifampicin (ICUP - 1.2%, HCG - 0%), 14.4% (31) fusidic acid (ICUP - 17.1%, HCG - 12.8%), 7% (15) ciprofloxacin (ICUP - 14.6%, HCG - 2.3%), 9.3% (20) chloramphenicol (ICUP - 9.8%, HCG - 9%). We observed 25 specimens with methicillin resistant coagulase-negative Staphylococcus. All CNS were sensitive to vancomycin. There was statistically significant difference in resistance between groups to penicillin (rho - 0.185), oxacillin (rho - 0.253), ceftazidime (rho - 0.185), tetracycline (rho - 0.283), gentamicin (rho - 0.258) and ciprofloxacin (rho - 0.236),  $p < 0.05$ .

### Conclusions

1. Staphylococcus aureus colonize intensive care unit patients 2.25 times more than healthy control group, however there was no significant difference in resistance to drugs.
2. We did not find significant difference in *S. aureus* resistance to methicillin between groups, however *S. aureus* was 4 times more resistant to methicillin isolated from intensive care unit patients.
3. Coagulase-negative Staphylococcus resistance to most commonly used drugs was higher in intensive care unit patients group than in healthy control group.

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## STATIC LACTATE VERSUS DYNAMIC LACTATE WITHIN FIRST 24H IN PATIENTS WITH SEVERE COMMUNITY ACQUIRED PNEUMONIA

*Dārta Ose, Krista Nītiņa*

*Supervisor of the abstract: Oļegs Sabeļņikovs*

*Rīga Stradins university, Latvia*

### Introduction

There are many discussions that one of the mortality risk makers for patients admitted to intensive care unit (ICU) with different etiology shock is blood lactate level and it changes within first 24 hours. It is believed that serum lactate could be used as an early marker of mortality risk determination, but until now it is not clear wheter statistically more significant is static lactate (LAC1, LAC2, LAC3, LAC4, LACMAX, LACMIN) or dinamic lactate (LACTW, Delta LAC%, Delta LACabs) levels. Untill now there is no research papers about serum lactate prognostic significance in patients with severe community acquired pneumonia in first 24 hours after admission to ICU.

## Aim

To evaluate the prognostic significance of the first lactate level in patients with severe pneumonia.

## Objectives

1. To compare the statistical data of (LAC1, LAC2, LAC3, LAC4, LACMAX, LACMIN). To find admission lactate reference level which is attributed to significant increase of mortality.
2. To compare dynamic lactate, especially LACTW, as well as Delta LAC%, Delta LACabs levels and they prognostic significance in first 24 hours after admission in ICU.
3. To compare with other markers and scoring systems like: PCT (procalcitonin), CRP (C-reactive protein), CURB-65 (pneumonia severity score), APACHEII (Acute Physiology and Chronic Health Evaluation II).
4. Investigate whether lactate levels in the speed and dynamics measurements in the first 24 hours after ICU hospitalization is associated with clinical outcome.

## Methods

Retrospective observational study in which data were collected on all patients admitted to ICU with pneumonia and sepsis and/or septic shock in two major Hospitals Republic of Latvia (Eastern Clinical university hospital and Pauls Stradins Clinical university hospital) with primary diagnosis of severe community acquired pneumonia (CAP). We compared the relationship between lactate values that were collected in 24 hour period after admission in ICU and ICU mortality. For data analysis used *MS Excel*, *SPSS* programs.

## Results

In this study we analyzed data from consecutive 73 patients with severe CAP and sepsis and/or septic shock and we observed statistically significant difference between the first lactate level (LAC1) in survivors (2.7 [1.9-3.2] (mmol/l) and non-survivors 4.9 [4.3-7.5] (mmol/l);  $p < 0.001$ ) and, time weighted lactate (LACTW) in survivors 2.3 [2.0-2.5] (mmol/l) and in non-survivors 4.5 [3.7-5.6] (mmol/l). In first 24 hours was not found any statistically significant correlation between other dynamic lactate levels, Delta LACabs ( $p = 0,065$ ) and Delta LAC% ( $p = 0,14$ ) and mortality. According to my data patients with LAC1  $< 3.0$  (mmol/l) mortality risk was 0%, patients with LAC1 3.0 – 4.0 (mmol/l) risk was 42.1%, while patients with LAC1  $> 4.0$  (mmol/l) mortality risk reached 89.7%. Lactate level measurements in first 24 hours after hospitalization in ICU have had high ability to stratify non-survivor patients: LAC1 (0.96), LAC2 (0.98), LAC3 (0.97), LAC4 (0.92), LACTW (0.99) (AUC). In comparison with other prognostic markers sensitivity and specificity following results were obtained: CRO (0.59), PCT (0.98), APACHE II (0.98), CURB-65 (0.63). Average time of decreasing of lactate level was 0.25 (mmol/l/h) in survivors and 0.64 (mmol/l/h) in non-survivors.

## Conclusions

Summarizing data on patients with severe pneumonia and sepsis and/or septic shock admission lactate and LACTW levels in first 24 hours have significant independent predictive value. In first 24 hours after admission in ICU higher mortality were observed if LAC1 was  $> 3$  (mmol/l). Data proves that patients with severe pneumonia LAC1 is having similar prognostic ability like APACHE II and PCT, and significantly better prognostic ability than CRP and CURB-65. Blood Lactate level measurements in emergency department would be helpful for risk stratification.

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## **THE EVALUATION OF POST-OPERATIVE NAUSEA AND VOMITING (PONV) IN PATIENTS WHO WERE GIVEN DIFFERENT COMBINATIONS OF ANTIEMETIC DRUGS AFTER LAPAROSCOPIC GALLBLADDER REMOVAL OPERATIONS**

*Emilija Navickaitė, Aistė Pucilauskaitė*

*Supervisor of the abstract: Eglė Kontrimavičiūtė*

*Department of Anesthesiology and Intensive Care, Vilnius University, Lithuania*

### **Introduction**

Postoperative nausea and vomiting (PONV) is one of the most common side effects after general anesthesia. PONV reduces patient comfort and their sense of satisfaction after surgery and in rare cases can lead to dehydration and electrolyte imbalance, aspiration of gastric contents and bleeding. From 25 to 30% of patients during postoperative period suffer PONV, and for high-risk patients, this risk increases to 80%.

### **Aim**

The aim of this study was to evaluate the effect of nausea and vomiting inhibition medications and the number of risk factors under the Apfel scale for post-operative nausea and vomiting control.

### **Objectives**

- To determine the importance of different antiemetic drug combinations (Dexamethasone versus Dexamethasone and Ondansetron (combined prophylaxis)) on PONV manifestation during early postoperative period
- To evaluate the number of PONV risk factors under the Apfel scale which could particularly increase PONV manifestation. The Apfel scale consists of female gender, non-smoking condition, nausea related to motion, previous experience of PONV and postoperative opioid use.

### **Methods**

It is a prospective randomized study performed in the Department of Anesthesiology and Intensive Care at Vilnius University Hospital, Santariškių Klinikos from January to March, 2014. We randomly included 60 patients whom laparoscopic gallbladder removal surgery was performed. The subjects were divided into two groups in regard to the antiemetic prophylaxis during general anesthesia: Group I was administered Dexamethasone, whereas group II received Dexamethasone and Ondansetron (combined prophylaxis). Patient randomization using envelope approach was applied. Less than 4 hours after the surgery, patients were asked to fill in a questionnaire which included questions about PONV risk factors and their general well-being after the surgery. The respondents did not know what medication they received during the surgery. We evaluated the role of different antiemetic drug combinations on

PONV manifestation during early postoperative period (up to 4 hrs after surgery) and the presence of PONV risk factors under the Apfel scale (0-5 points) which include: female gender, non-smoking, nausea related to motion, previously experienced PONV, and the use of opioids for pain relief purposes during the postoperative period. Statistical analysis was performed by means of MS Office Excel and GraphPad Prism 6 software. The data was analyzed using an independent t – test. Whereas p value was less than 0.05, the data were considered as statistically significant.

## Results

There were 30 patients in each group. Within groups, patients were distributed similarly by age and sex: the average age in GR I was  $57.87 \pm 12.93$  years vs.  $53.76 \pm 14.74$  years in GR II; the number of female in GR I was 24 (80%) vs. 25 (83.3%) in GR II. In group I, 16 patients (53.33%) complained on early postoperative nausea (up to 4 hrs. after surgery), out of which 7 (23.33%) had mild, 7 (23.33%) moderate and 2 (6, 67%) severe symptoms. In Group II, respectively 9 (30%), out of which 6 (20%) had mild, 3 (10%) moderate, and 0 (0%) severe symptoms ( $p = 0.0264$ ). In Group I, 10 (33.33%) patients complained on early postoperative vomiting; in Group II, respectively, 1 (3%) ( $p = 0.0185$ ). According to Apfel's risk factor scale in Group I, 5 risk factors (RF) were observed in two subjects, both had nausea and vomiting (100%); respectively 4 RF found in 12 patients, of which 7 (58,33%) reported nausea and 5 (41.67%) vomiting; 3 RF found in 9 patients, of which 5 (55.56%) had nausea and 3 (33.33%) vomiting; 2 RF in 3, who had neither nausea (0%) nor vomiting (0%); 1 RF in 4 patients, of whom 2 (50%) reported nausea and no vomiting (0%). Accordingly, in Group II, 5 RF were found in 3 patients, of which 1 (33.33%) had nausea and 1 (33.33%) was vomiting; 4 RF in 5 patients, of which one (20%) had only nausea; 3 RF in 16 patients, of which 7 (43.75%) had nausea; nobody had 2 RF, and 1 RF established in 1 patient with no nausea or vomiting.

## Conclusions

Our results showed that, when two antiemetic medications are given (combined antiemetic prophylaxis – Dexamethasone and Ondansetron) the incidence of PONV after laparoscopic gallbladder removal surgery is statistically significantly lower than just Dexamethasone. However, the number of risk factors has no effect on the manifestation of nausea, but the combination of antiemetic drugs can markedly reduce the incidence of vomiting. These findings support the current recommendation of the PONV treatment guidelines that PONV may be prevented if high – risk patients are identified and prophylactic treatments are administered.

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# THE EVALUATION OF RISK FACTORS FOR ACUTE POSTOPERATIVE PAIN

*Dovilė Bendinskaitė, Miglė Siderkevičiūtė*  
*Supervisor of the abstract: Liuda Brogienė*  
*The Lithuanian University of Health Sciences, Lithuania*

## **Introduction**

It is known that effective pain management includes patient comfort and therefore satisfaction, earlier mobilization, fewer pulmonary and cardiac complications, a reduced risk of deep vein thrombosis, faster recovery with less likelihood of development of neuropathic pain and reduced cost of care [1][3]. Consequently, it is very important to evaluate the risk factors which are related with acute postoperative pain.

## **Aim**

To evaluate the risk factors for acute postoperative pain.

## **Objectives**

To evaluate postoperative pain reliance on patients gender, age, education, comorbidities, preoperative pain intensity, pain medications used before operation, operation type, anaesthesia type, ASA class and duration of operation on the first and the second day after operation.

## **Methods**

From February 2015 to March 2015, in Hospital of Lithuanian University of Health Sciences Kauno Klinikos Orthopaedics and Traumatology, Obstetrics and Gynaecology, Surgery and Urology departments were collected data from 90 patients who underwent surgical procedures. Patients were questioned using survey made by the authors. Pain intensities were evaluated according to visual analogue scale (VAS) and words analogue scale 24 and 48 hours after surgery. Pain intensity was divided according to this pattern: 0 point – no pain, 1 - 3 points – mild pain, 4 - 6 points – moderate pain, 7-8 points- severe pain and 9 – 10 points – unbearable pain [2].

Statistical data analysis was performed with statistical program SPSS 22.0 (Statistical Package for Social Sciences) and Microsoft Office Excel 2010. Categorical data were compared by using chi-square test. The comparison of proportions between groups was performed using z test. Values are expressed as the mean, standard deviation, Odds Ratio (OR) or 95% confidence interval (95% CI). In order to investigate the risk factors for acute postoperative pain, logistic regression analysis were carried out to assess the adjusted association between the risk factors and acute postoperative pain. A bivariate analysis was carried out using a significance criterion of  $P < 0,05$  to identify which variables were independently associated with acute postoperative pain.

## **Results**

The study included 90 participants: 34 males (37.8%) and 56 females (62.2%). Patients mean age was 58.28 years (standard deviation 15.4). First day after operation, patients with arterial hypertension had a bigger risk for severe or unbearable pain OR of 3.82 (95% CI 1.5 – 9.72). Patients, who suffered from dizziness before operation, had a bigger risk for severe or unbearable pain OR 9.24 (95% CI 1.08 – 79.1). Arthroplastic surgery is a risk factor for severe or unbearable pain compared to laparotomy, the OR 5.93 (95% CI 1.64 – 21.48). In the second day after operation severe or unbearable pain sensation depends on education. Patients with higher education, more often tend to experience severe or unbearable pain OR 4.74 (95% CI 1.19 – 19.02). Likewise patients with hernioplasty tend to experience severe or unbearable pain more often OR 10.8 (95% CI 1.06 – 110.14).

Risk factors such as gender, sleeping disorders, tachycardia, diabetes mellitus, cancerous processes, medications used before surgery, anaesthesia type, ASA class, surgical intervention duration and pain intensity before operation had no statistically significant relation with acute postoperative pain.

## Conclusions

On the first day after surgery the risk factors for acute postoperative pain are comorbidities such as arterial hypertension and dizziness, and arthroplastic surgeries. The risk factors for the acute postoperative pain on the second day after operation are higher education and hernioplastical surgery.

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## **BASIC SCIENCES & PHARMACOLOGY SESSION**

# BODY SIZE OF NEWBORNS IN RELATION TO LIFE STYLE FACTORS OF MOTHER AND FATHER

*Julita Valančauskytė, Monika Tamulionytė*

*Supervisor of the abstract: Janina Tutkuvienė*

*Anatomy, Histology and Anthropology Department, Medicine Faculty of Vilnius University, Lithuania*

## **Introduction**

Birth body size is still recognized as one of the best risk indicators of neonatal mortality and morbidity. Newborn weight >4000g (macrosomia) can increase the risk of infant mortality and has influence to develop different diseases in the future. Suboptimal newborn weight (2500-3000g) disturbs neonatal period. A healthy pregnancy always lowers the possibility of pathological delivery. Mother is not the only who matters- father's habits count too. Growing scientific evidence suggests that father's lifestyle has a great impact on the health of his unborn baby.

## **Aim**

To assess the influence of parents' lifestyle on body size of newborns.

## **Objectives**

To find connection between parents lifestyle and newborns weight. By using questionnaire, to assess parents habits and divide them into subgroups:

1. Parents who slept: <6h, 6-8h and >10h.
2. Mothers who was physically active during pregnancy and were not.
3. Mothers who was on a diet during pregnancy and were not.
4. Fathers mental work representatives and representatives of physical work.
5. Fathers who ate at cafe and those ate at home. Compare subgroups results to be able to find connection between newborns weight groups and parents lifestyle habits.

## **Methods**

The study took place at the Department of Obstetrics and Gynaecology at Vilnius University Hospital "Santariskiu Klinikos": both parents (mothers and fathers) of newborns were interviewed using questionnaire which contained 84 questions related to life style, physical activity, social factors, nutrition, etc. Body size of newborns was redrafted from the hospitals' case-records. The final analysis included 254 mothers and 251 fathers that had full term newborns. Weight of newborns was divided into 3 sub-groups: suboptimal (SUB) <3000g, normal (NORM) 3000-4000g and overweight (OW) >4000g. Data were analyzed using SPSS and Microsoft Excel. The statistical significance between sub-groups was determined using Chi-square test.

## **Results**

There was a statistically significant relation ( $p < 0,05$ ) between sleep duration of the mother during pregnancy and the size of the newborn. Mothers who slept 8-10 h per night had newborns with NORM weight (75,4%) more often and rarely OW newborns (7,9%) than those who slept <6h or >10h per night (<6h 57,1%; 33,3% and >10h 60,9%; 21,7%) respectively. Mothers who had regular physical activity (1-4 times per week) more often had newborns with SUB weight (31,4%) and rarely with NORM weight (57,1%) than those who did not (14,9% and 70,8%) respectively ( $p < 0.05$ ). Mothers on a diet during pregnancy more often had OW newborns (28,6%) and rarely with NORM weight (57,6%) than those who were not on a diet (12,8% and 70,8%) respectively ( $p < 0,05$ ). There was a tendency ( $p = 0,06$ ): fathers who slept 8-10 h per night had newborns with SUB weight (28%) more often and rarely OW newborns (8%) than those who slept <6h per night (14,3% and 22,9%) respectively. Fathers mental work representatives more often had newborns with NORM weight (68,9%) and rarely with SUB weight (13,6%) than representatives of physical work (56,8% and 27,3%) respectively ( $p < 0,05$ ). There was a relation ( $p < 0,01$ ) that those fathers who often ate at cafe rarely had newborns with NORM weight (57,1%) compared to the other fathers (72,2%) ( $p < 0,05$ ).

## Conclusions

1. Mothers who slept during a pregnancy 8-10 h per night had newborns with NORM weight more often; mothers and fathers who slept <6h – OW more often.
2. Pregnant women who had regular physical activity more often had newborns with SUB weight.
3. Mothers on a diet during pregnancy more often had OW newborns.
4. Fathers who worked physical work more often had SUB newborns.
5. Fathers who often ate at café rarely had NORM newborns.

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## COMPARISON OF DIFFERENT DOSES OF DEXAMETHASONE, ONDANSETRON AND THEIR COMBINATIONS IN PREVENTING POSTOPERATIVE NAUSEA AND VOMITING AFTER LAPAROSCOPIC CHOLECYSTECTOMY

*Petras Petkevicius, Egle Semaskaite*

*Supervisor of the abstract: Egle Svitojute, Darius Trepenaitis, Andrius Macas, Audrius Sveika*

*Institute of Physiology and Pharmacology, LSMU, Lithuania*

### Introduction

Postoperative nausea and vomiting (PONV) is common, distressing and very unpleasant complication. The general incidence of nausea is about 50%, vomiting about 30%. in high risk patients the overall incidence of PONV can be as high as 80% for high risk patients [1]. PONV is one of the most frequent complications after laparoscopic cholecystectomy and remains one of the biggest issues in laparoscopic surgery [2]. Therefore, effective antiemetic therapies must be developed.

### Aim

The main objective of this study was to assess and compare the effectiveness of different doses of dexamethasone, ondansetron and their combinations in preventing postoperative nausea and vomiting after laparoscopic cholecystectomy.

### Objectives

- 1) To determine the risk factors of PONV.
- 2) To determine the difference between different doses of dexamethasone, ondansetron and their combinations in preventing PONV.
- 3) To determine and compare the duration until the first PONV episode between the dexamethasone, ondasetron and combination groups.

### Methods

The prospective, double-blind, randomized trial was carried out at Lithuanian University of Health Sciences (LSMU), Department of Anaesthesiology from March 2014 to March 2015. After approval from LSMU Bioethics Centre written informed consent was obtained from all study participants. 200 ASA physical status I-III patients undergoing laparoscopic cholecystectomy were recruited for the study. Based on computer-generated random number sequence

patients were allocated to one of 5 groups (n = 40 per group): dexamethasone 4 mg (D4), dexamethasone 8 mg (D8), ondansetron 4 mg (O4), dexamethasone 4 mg plus ondansetron 4 mg (D4O4), dexamethasone 8 mg plus ondansetron 4 mg (D8O4). Dexamethasone was administered i.v. immediately after anaesthesia induction, ondansetron - i.v. at the end of surgery. Anaesthesia was administered according to standardized protocol. Patients were interviewed 24-48 hrs after surgery using anonymous original questionnaire based on literature review, developed by our research group. Statistical data analysis was processed with SPSS Statistics 17.0. The  $\chi^2$  test was used for comparisons of non-parametric data. Duration until first PONV episode was estimated using Kaplan-Meier survival probabilities. Multivariate logistic regression model was performed to determine risk factors of PONV. Odds ratios (OR), 95% confidence intervals (CI) and P-values were calculated for each independent variable.  $P < 0.05$  was considered to be statistically significant.

## Results

Mean age of patients was  $57.11 \pm 14.73$  (range 19-90). Most study participants were female (77.5%), from urban place of residence (67.0%), non-smokers (83.5%), Apfel PONV risk score - 3 (52%), small percentage had history of PONV (20.0%), motion sickness (5.5%) or migraine (15.5%). There were no significant differences among groups with respect to patients characteristics, Apfel PONV risk score, duration of surgery, postoperative opioid consumption. Young age (18-29 years;  $p = 0.001$ ; OR = 29.721; 95%CI 3.905-226.222) and history of PONV ( $p = 0.001$ ; OR = 4.195; 95% CI 1.306-13.471) were identified as independent risk factors of PONV.

The overall incidence of PONV was 28.5% (nausea - 23.5%; vomiting - 5%). There was a significant difference between groups according to overall PONV incidence ( $p = 0.037$ ;  $\chi^2 = 16.392$ ) and the incidence of vomiting ( $p = 0.021$ ;  $\chi^2 = 11.579$ ). There were 5 patients in D4 (12.5%), 4 patients in D8 (10.0%) and 1 patient in D8O4 group (2.5%) who vomited, none in O4 and D4O4 groups. We found no significant difference between groups according to the incidence of postoperative nausea ( $p = 0.296$ ;  $\chi^2 = 4.912$ ). Nausea was present in 10 patients in D4 (25.0%), 9 patients in D8 (22.5%), 14 patients in O4 (35.5%), 7 patients in each D4O4 (17.5%) and D8O4 (17.5%) groups. Kaplan-Meier survival analysis shown that duration until the first PONV episode was significantly longer in D8O4 ( $p < 0.001$ ;  $11.63 \pm 2.75$  hrs) than in D4 ( $6.07 \pm 1.05$ ), D8 ( $7.70 \pm 1.61$ ), O4 ( $5.57 \pm 1.02$ ), D4O4 ( $7.29 \pm 1.43$ ) groups.

## Conclusions

- 1) Significantly higher percentage of vomiting episodes was observed in dexamethasone monotherapy groups (both 4 mg and 8 mg).
- 2) Duration until the first PONV episode was significantly longer in dexamethasone 8 mg i.v. plus ondansetron 4 mg i.v. prophylaxis group.
- 3) Combination antiemetic prophylaxis before laparoscopic cholecystectomy is advantageous in comparison to monotherapy.

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# COMPARISON OF PROCESSES NUMBER IN THE FROG INTRACARDIAC NEURONS

Augustina Grigaitė, Greta Graužinytė  
Supervisor of the abstract: Gertrūda Skripkienė  
Institute of Anatomy, LSMU, Lithuania

## Introduction

A frog heart model is very convenient for studying properties of intracardiac neurons due to the following characteristics: parts of cardiac plexus are clearly defined, neurons in thin heart walls are easily accessible and preparation viability time is prolonged. Although the architecture of the intracardiac nerve plexus and some morphological characteristics of the frog cardiac ganglion cells have been studied, little is known about the relation between morphology and location of cardiac neurons. In this study, we aimed to define what kinds of neurons, according to their processes number, are distributed in different parts of the frog intracardiac plexus. Intracellular fluorescent dye injection method is suitable to reveal the morphology and architecture of live neurons, and allows to study neurons in their natural environment <sup>(1)</sup>.

## Aim

To determine the correlation between the processes number in frog **Rana temporaria** intracardiac neurons with their location in intracardiac plexus: in major nerves and neural ganglia, and, in the wall of venal sinus and interatrial septum.

## Objectives

1. To divide neurons into groups according to their location in cardiac plexus.
2. To divide neurons into groups according to their processes (excluding axon) number: neuronal processes, processes starting from neuron's soma or axon, short and long processes.
3. To determine and to compare the distribution of neurons, which were divided into groups according to their processes number.

## Methods

1. 13 adult **Rana temporaria** frogs of both sexes were used. The experiments were done in accordance to LSMU guidelines for the use of experimental animals.
2. 79 live intracardiac neurons were injected iontophoretically using intracellular fluorescent dyes LY CH (n = 44) and AF568 (n = 35).
3. Neurons were observed and photographed using fluorescent microscope Axiolmager Z1 equipped with Apotome. Length and the number of neuronal processes were measured using image analyzing software AxioVision 4.7.2.
4. Neurons were divided into two groups: neurons of major nerves and neural ganglia (NGN, n = 43), and wall neurons (WN, n = 36). NGN accompany the major nerves of anterior caval veins and interatrial septum or are located in sinoatrial and atrioventricular ganglia. WN are freely distributed in the wall of venal sinus and interatrial septum, farther from the nerves and ganglia mentioned above.
5. Processes extending from cell body were called soma processes, meanwhile processes extending from axonal hillock and its proximal part - axon processes. Short processes were longer than 10 μm and did not exceed the long axis of soma, long processes were longer than the long axis of soma. Principal neuronal processes and their branches were counted as processes. Axons were excluded from the count of processes.
6. Statistical analysis between the frequencies of the processes number was performed with Student's independent test (MS Excel; Microcal Origin v. 6.1). Significance was accepted at P < 0,05.

## Results

1. All neurons had at least one process. All wall neurons (100%) (WN) had 4-30 processes. In the major nerves and neural ganglia neurons (NGN) group 81,4% had 4-30 processes, 18,6% had 1-3 processes. These differences between two groups were statistically significant ( $P < 0,05$ ).
2. Neurons which had processes starting only from soma in the groups of WN and NGN were 5,6% and 2,3% respectively. Neurons only with axonal processes in the group of WN comprised 31,6%, and in the group of NGN – 48,8%. Neurons having processes starting both from soma and from axon in WN group comprised 58,3% and in the NGN group – 48,8%.
3. WN and NGN group neurons which had 1-10 soma processes comprised 50,0% and 51,2% respectively. NGN group neurons which had more processes weren't found, meanwhile WN group neurons which had 11-28 processes comprised 13,9% ( $P < 0,05$ ).
4. The majority of neurons from both groups had 1-10 axonal processes: WN – 75,0%, NGN – 76,7%. With 11-23 axonal processes in WN group were 19,4% and in NGN group – 20,9%.
5. The majority of neurons in both groups had both short and long processes. In the WN group – 91,7%, and in the NGN group – 76,7%. Neurons which had only short processes were more abundant in NGN group – 18,6%, and in WN group – only 2,8% ( $P < 0,05$ ). Neurons which had 1-10 long processes in WN and NGN groups were 72,2% and 76,7% respectively. The 25,0% of the WN group had 11-19 long processes, while NGN group had 4,7% of the same quantity of processes ( $P < 0,05$ ).

## Conclusions

1. Comparison of intracardiac frog neurons revealed that the heart wall neurons differed from the neurons of major nerves and neural ganglia in greater number of neurons which had more neuronal processes, more processes starting from neuronal soma and more longer neuronal processes.
2. Neurons which had only short processes were more abundant among neurons of major nerves and neural ganglia than in the wall neurons.

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## IMMUNOHISTOCHEMICAL ANALYSIS OF INTRINSIC NEURONS IN WHOLE MOUNT PREPARATIONS OF THE RABBIT VENTRICLES

*Gabrielė Rudokaite*

*Supervisor of the abstract: Neringa Paužienė*

*Institute of Anatomy, LSMU, Lithuania*

## Introduction

The arterial cone is the anterosuperior part of the right ventricle of the heart at the entrance to pulmonary trunk. According to recent research, the components of the intrinsic cardiac nervous system independently from their location are related both to physiologic heart function and the electrophysiological disorders (1,2). There is lack of information about neuroanatomy of the rabbit ventricles. The neuronal somata located in this area are heavily detectable and therefore data about their distribution and size are not sufficient and neurochemical phenotype is still unknown.

## Aim

This study was aimed to determine the location, immunohistochemical phenotype and size of intrinsic neurons somata in the rabbit arterial cone and the root of the pulmonary trunk.

## Objectives

1. To analyse distribution of neurons in the arterial cone and the root of the pulmonary trunk.
2. To examine phenotype of nerve cells somata.
3. To determine diameter of singular and ganglionic neurons somata.

## Methods

During the research 10 White New Zealand rabbits of both sexes (age 1 to 2 months) were used. The arterial cone and the root of the pulmonary trunk were separated from the ventricles and whole mount preparations were prepared. The neurochemical phenotypes of ventricular neurons were identified performing immunohistochemical reactions using primary antibodies against protein gene product (PGP) 9.5, choline acetyltransferase (ChAT), tyroxine hydroxylase (TH), substance P (SP) and neuronal nitric oxide synthase (nNOS). Preparations were examined and their images acquired by confocal microscope LSM 700 (Zeiss, Germany) and ZEN 2010 (Zeiss, Germany) software. The long and short axes of each neuron soma were measured and the average somatic diameter was calculated. Student's t-test was used for the statistical significance analysis (MS Excel 2007). The difference was statistically significant when  $p < 0.05$ .

## Results

During the study 588 intrinsic neurons were found. The number of neurons varied from 11 to 220 in one preparation, but several hearts had no neurons at all. The majority (93.54%) of neurons were localized in the adventitia of the pulmonary trunk nearby or slightly above the semilunar valves, while 6.4% of all nerve cells were revealed in the epicardium of conus arteriosus. 93.71% of nerve cells were assembled into small ganglia containing 2 to 34 neurons (in average  $6.6 \pm 0.73$ ) and 6.29% of neurons were singularly scattered, predominantly in the arterial cone. The cholinergic (ChAT+), nitrinergic (nNOS+) and biphenotypic (ChAT+/TH+ and ChAT+/nNOS+) neuronal somata were found, while peptidergic (SP+) nerve cells were not detected. In the arterial cone 94.74% of neurons were ChAT positive, while phenotype of 5.26% neurons was not identified (PGP+/ChAT-). The majority (67.09%) of the pulmonary trunk neurons were cholinergic, also nitrinergic (2.31%), biphenotypic (ChAT+/nNOS+ (6.54%) and ChAT+/TH+ (5.27%)) neurons and groups of small intensively fluorescent (SIF) cells (PGP-/TH+) were revealed. The phenotype of 18.73% nerve cells was not determined (PGP+/ChAT-, PGP+/TH+, PGP+/TH-). The average diameter of neuron soma was  $24.8 \pm 0.2 \mu\text{m}$ . The size of singular neurons ( $25.6 \pm 1.3 \mu\text{m}$ ) and ganglionic nerve cells ( $24.7 \pm 0.2 \mu\text{m}$ ) was similar, but body size of neurons was related to their chemical phenotype. Nitrinergic neurons ( $20.5 \pm 1 \mu\text{m}$ ) were statistically significant smaller than others.

## Conclusions

1. The majority of rabbit ventricular neurons were located on the root of the pulmonary trunk.
2. The majority of cardiac nerve cells were concentrated in small ganglia.
3. The arterial cone and the root of the pulmonary trunk were innervated by cholinergic, nitrinergic and biphenotypic neurons.
4. There were neurons whose phenotype was not identified.
5. The diameter of ganglionic and non-ganglionic neuronal somata did not differ significantly. Nitrinergic neurons had significantly smaller soma than nerve cells of other phenotypes.

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# INVESTIGATION OF OPTICAL FEATURES AT DIFFERENT WAVELENGTH LIGHTS IN HUMAN, PIG AND RABBIT HEARTS

*Marija Kinderyte, Simona Sabulyte, Ieva Jonaitiene*  
*Supervisor of the abstract: Jonas Jurevicius, Rūta Vosiliūtė*  
*Institute of Cardiology, LSMU, Lithuania*

## Introduction

Last decade optical methods became widely-used instruments in cardiac electrophysiology. Optical mapping (multi-site fluorescence measurements with high temporal and spatial resolution) is a method used in cardiac electrophysiology to analyze the heart's regular rhythm and arrhythmias.

Voltage sensitive dyes are the key elements in optical mapping experiments and are used to study electrical activity of the cardiac tissue. However, to evaluate optical mapping results, optical features of myocardium which could depend on tissue structure, fiber orientation, perfusion (Tyrode solution, blood) and etc. should be also evaluated.

## Aim

Our aim was to investigate optical features of myocardium dependence on different wavelength lights.

## Objectives

Experimentally using different wavelength lights to measure light distribution in myocardium and using mathematical formulas to calculate constant of light penetration.

## Methods

Experiments were made using Langendorff-perfusion system together with optical mapping system: light source (LED) and EMCCD camera (128x128 pixels).

For our experiments we used three different objects: slab of human heart ( $n = 1$ ), slabs of pig heart ( $n = 2$ ) and whole rabbit hearts ( $n = 2$ ). Slab of human heart was not cannulated, without perfusion and immersed in blood before experiment. Rabbit hearts were perfused using Tyrode's solution via aorta and a small cut was made in left ventricle wall (like "window"). Slabs of pig hearts were also cannulated and perfused with Tyrode's solution. Tissues were excited from epicardial surface with 470 nm, 505 nm, 530 nm, 590 nm, 660 nm, 735 nm wavelengths light, while a video camera aimed at transmural side viewed the decay of light with tissue depth.

There was no fluorescent dye in the tissue. In calculations we used mathematical formulas [1, 2]. The weighting function  $w(z)$  – the product of excitation and emission light, was used to calculate approximately the fluorescence contributions of different layers to the total fluorescence escaping from surface:  $w(z) = \Phi(z)G(z)$ , where  $z$  is the depth of myocardium.

According to diffusion theory, light transport away from the source is followed by an exponential decay. Excitation and emission light in tissue have been described by fluence rate and escape function:  $\Phi(z) = C_1 \exp(-k_1z/\delta_{ex}) - C_2 \exp(-k_2z/\delta_{ex})$  here  $\Phi(z)$  is the amount of light, at depth  $z$ , and  $\delta_{ex}$  is the penetration depth for the excitation light.  $C_2 \exp(-k_2z/\delta_{ex})$  describes light reflection at the epicardial surface.  $G(z) = C \exp(-k_3z/\delta_f)$  where  $G$  is escape function, which represents intensity of fluorescence escaping from tissue depth and  $\delta_f$  is the penetration depth. We calculated penetration depth,  $\delta$ , which was averaged from many measurements in one tissue. For statistical evaluation a paired Student's t-test was used, and a difference was considered significant when  $p < 0.05$ .

## Results

Light penetration in a myocardium depends on light wavelength. At 470 nm light  $\delta$  was  $0.29 \pm 0.04$ ,  $0.52 \pm 0.01$  and  $0.58 \pm 0.02$  mm in human, pig and rabbit hearts respectively. At 505 nm light  $\delta$  was  $0.58 \pm 0.01$  mm in human heart,  $0.73 \pm 0.02$  mm in pig heart and  $0.63 \pm 0.01$  mm in rabbit heart. At 530 nm light  $\delta$  in human heart, pig heart and rabbit heart was same  $0.8 \pm 0.04$  mm. At 590 nm light  $\delta$  in human heart was  $0.84 \pm 0.04$  mm in pig heart  $\delta$  was  $0.96 \pm 0.02$  mm, and in rabbit heart it was higher almost twice –  $1.75 \pm 0.05$  mm. At 660 nm light  $\delta$  was  $1.11 \pm 0.02$  mm in human

heart, in pig and rabbit heart it was the same  $1.8 \pm 0.03$  mm. At 735 nm light  $\delta$  was  $1.48 \pm 0.05$ ,  $2.35 \pm 0.04$  and  $1.95 \pm 0.04$  mm in human, pig and rabbit hearts respectively. All results are statistically significant. From our results we can see, that increasing wavelengths of light  $\delta$  increases also and this tendency is similar in all preparations. But if to compare  $\delta$  between objects, we can see a difference on  $\delta$  values at same nm of light illumination. In human heart  $\delta$  values at almost every nm light were lower in comparison to pig and/or rabbit heart. It might happen because of a condition of human heart slab and a blood inside tissue. The  $\delta$  values might be lower because light can be absorbed by hemoglobin molecules and other chromophores in a tissue.

### Conclusions

Our results allow us to choose proper wavelength dyes in evaluation of optical features of different depth cardiac tissue. Also allow us to evaluate origin of alterations of the tissue, when tissue, for example is with/or without blood or in other conditions. The obtained data could assist for better understanding of the optical signal formation in cardiac tissue.

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## LIPID PROFILE, COMPLETE BLOOD COUNT AND C-REACTIVE PROTEIN: SEASONALITY AND CORRELATIONS

*Simonas Jesmanas, Gintarė Vaičiaitė*

*Supervisor of the abstract: Viltė Marija Gintauskienė*

*Department of Biochemistry, LSMU, Lithuania*

### Introduction

Lipid profile, complete blood count (CBC) and C-reactive protein (CRP) together provide information about metabolic, hematological and inflammatory processes in various physiological and pathological conditions. Previous studies showed that lipid profile exhibits seasonality (1-3) and is associated with hematological parameters (4) and CRP (5,6). Thus, laboratory test data can be used to evaluate the characteristics and associations of patients' metabolic, hematological and inflammatory parameters.

### Aim

To evaluate the seasonality and correlations of lipid profile, CBC and CRP test results.

### Objectives

1. To evaluate the seasonality of lipid profile, CBC and CRP test results.
2. To evaluate the seasonality of lipid profile, CBC and CRP test results by age and gender.
3. To evaluate the correlations of lipid profile, CBC and CRP test results.

### Methods

A retrospective study of laboratory test results of patients admitted to Lithuanian University of Health Sciences (LSMU) Kaunas Clinics hospital in January, April, July and October of 2014 was conducted (LSMU Centre for Bioethics permission No. BEC-MF-330). Only those who had all of the following test results were included: cholesterol (Chol), atherogenic coefficient (AC), low density lipoprotein (LDL), high density lipoprotein (HDL), triglycerides (TG), leukocytes (WBC), platelets (PLT), hematocrit (HCT), mean corpuscular volume (MCV), mean hemoglobin concentration (MCH) and CRP.

Test results of 905 patients (478 men, 427 women), 238 (26,3%) of them in January, 195 (21,5%) in April, 217 (24%) in July and 255 (28,2%) in October were analyzed. Mean age:  $56,41 \pm 15,97$ . Patients were divided into age groups: 1st group consisted of ages 18 to 40 (44 patients; 4,9%), 2nd - 41 to 55 (176 patients; 19,4%), 3rd - 56 to 70 (410 patients; 45,3%) and 4th - over 70 (275 patients; 30,4%).

Data is presented as mean  $\pm$  SD or median (min;max). Correlations of quantitative variables were determined using Pearson or Spearman correlation coefficients, independent samples were compared using Student's t, ANOVA, Mann-Whitney or Kruskal-Wallis tests depending on normality of data distribution and number of groups being compared. Very weak correlations ( $r = 0-0,2$ ) were not included in the results. Statistical significance level  $p < 0,05$ . Data analysis performed with IBM SPSS v22.

## Results

MCV and HDL exhibited seasonal variation: MCV was highest in October ( $90,37 \pm 4,56$  fl) compared with January, April and July ( $88,59 \pm 4,51$ ;  $89,08 \pm 4,30$ ;  $89,03 \pm 5,13$  fl, respectively) ( $p < 0,05$ ). HDL was higher in January compared with July ( $1,39 \pm 0,45$ ;  $1,26 \pm 0,39$  mmol/l, respectively) ( $p < 0,05$ ).

Women's Chol and HDL levels were lowest in July ( $5,45 \pm 1,30$ ;  $1,35 \pm 0,40$  mmol/l, respectively) and highest in January and April ( $p < 0,05$ ). Women's WBC concentrations were highest in April, lowest in October ( $7,37 \pm 2,32$ ;  $6,56 \pm 1,93$  \* 10<sup>9</sup>/l, respectively) ( $p < 0,05$ ).

Among the 2nd group LDL was highest in July, but lowest among the 4th in that same month ( $3,81 \pm 0,8$ ;  $3,04 \pm 0,85$  mmol/l, respectively) ( $p < 0,05$ ). Among the 4th group Chol was lowest in July ( $4,9 \pm 1,15$  mmol/l), while among the 2nd group AC and TG levels were highest in July ( $3,88 \pm 1,57$ ;  $2,05 \pm 1,23$  mmol/l, respectively) ( $p < 0,05$ ).

Several statistically significant weak correlations were found: between WBC and PLT ( $r = 0,244$ ); AC and WBC ( $r = 0,208$ ); CRP and WBC ( $r = 0,312$ ); TG and WBC ( $r = 0,229$ ); CRP and AC ( $r = 0,247$ ); LDL and HCT ( $r = 0,213$ ); TG and WBC ( $r = 0,229$ ), WBC and HDL ( $r = -0,211$ ); CRP and HDL ( $r = -0,362$ ). Among men WBC and HDL correlation was weaker ( $r = -0,138$ ), but a new correlation between CRP and HCT ( $r = -0,275$ ) emerged ( $p < 0,05$ ). Seasonal variation did not have a significant impact on most correlations, but in July correlation between CRP and HDL strengthened ( $r = -0,439$ ) ( $p < 0,05$ ).

## Conclusions

1. MCV results were higher in autumn, HDL - in winter.
2. Among 41 to 55-year-olds lipid profiles were worse in July, but better among those over 70 in July. Women's cholesterol and HDL were lowest in July.
3. There were mild but statistically significant correlations between lipid profiles, CBC and CRP results. The strongest correlation was observed between CRP and HDL in July.

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## MULTIDIRECTIONAL AFFECTION OF XANTHOHUMOL

*Daniel Piątek, Kamila Bąk, Krzysztof Jankowski, Joanna Szydełko*

*Supervisor of the abstract: Anna Boguszewska-Czubara*

*Medical University of Lublin, Poland*

### Introduction

Neurodegenerative disease is a term used to define broad range of disorders, in which main pathological mechanism damages neurons of central and peripheral nervous system. This group contains common diseases such as: Parkinson's disease, Alzheimer's disease, Huntington's disease and other. Degeneration of nerve cells manifests with movement and mental functioning impairment. That is why it can shorten life expectancy and decrease life quality. Statistics on the number of people with neurodegenerative diseases reveal the enormity of the problem. It is estimated that in 2050 every 85th person will suffer from Alzheimer disease. Social as well as economical costs of neurodegenerative disorders require better ways of diagnosis and treatment therapy. It has been suggested great role of oxidative- stress in nerve cell damage. Therefore scientists investigate affection of neuroprotective factors and prove ways to stop unfavorable process. Xanthohumol polyphenol chalcone from hops, has received recently attention, due to its neuroprotective activity which can be used in neurodegenerative diseases treatment.

### Aim

The aim of the study was to overview available literature about affection of xanthohumol on nerve cells.

### Objectives

1. Neurodegenerative disorders and stress-oxidative hypothesis.
2. Correlation between concentration of xanthohumol and surviving of nerve cells in environment of increased oxidative stress.
3. Cell defense mechanisms against free radicals.
4. Modifying ways of xanthohumol on neuroprotective mechanisms.

### Methods

To provide an overview we analysed accessible scientific literature. We had taken into consideration latest literature and articles going back to 2005.

### Results

It has been reported that Xanthohumol is one of the best natural antioxidants, which can be applied in cytoprotection. Efficient antioxidative mechanisms are essential in well-functioning human organism. It is well documented that oxidative stress is responsible for damage of different cells such as nerve, liver and pancreatic. Neurodegeneration is at the root of central nervous system diseases like Alzheimer's, Parkinson's, stroke and others. Recently scientists published research investigating role of xanthohumol neuroprotection in neuronlike rat pheochromocytoma cell line PC12. It occurs that Xn causes dissociation of Nrf2 from complex Nrf2-Keap1 and allows Nrf2 to bind antioxidant responsive element (ARE) initiating transcription of phase II genes, which participate in cell protection from hydrogen peroxide. Xanthohumol at concentrations less than 1 micromole did not reveal cytotoxicity. Moreover these concentrations increased available cells from 50% to 75% at pretreated with xanthohumol group compared with control group without Xn affection. Both groups were treated with H<sub>2</sub>O<sub>2</sub> before. Commonly used to create experimental model of Parkinson's disease is 6-OHDA. It appears that scientists from Lanzhou University achieved similar percentage survive of PC12 cells. Ability to upregulate genes responsible for neuroprotection was also revealed. Elevated levels of HO-1, NQO1 and Trx1 protein expression unambiguously showed activation of stress

protective cell mechanisms in oxidative stress conditions.

## Conclusions

Xanthohumol reveals neuroprotective effect, which can be applied in modern treatment of many neurodegenerative diseases. It modifies metabolic pathways via influence on Nrf2-Keap1 complex and takes part in upregulating genes engaged into production protein against oxidative stress. It is clear that researchers lead further simulations in vivo. It will let us better understand and exploit potential of this interesting compound.

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# THE MODIFICATION OF ANTIOXIDANT ENZYMES IN THE PATIENTS WITH BENIGN AND MALIGNANT BREAST DISEASES

*Bernaz Olga, Vişnevschi Anatolie*

*Supervisor of the abstract: Vişnevschi Anatolie*

*State University Of Medicine And Pharmacy "Nicolae Testemiţanu", Republic of Moldova*

## **Introduction**

Oxidative stress has been involved in the genesis of cancer. In patients with mammary gland tumors the process of peroxide oxidation of lipids (POL) is increased and metabolism disturbed. Glutathione-associated metabolism is a major mechanism for cellular protection against agents which generate oxidative stress and peroxide oxidation of lipids. In the Republic of Moldova were registered 896 new cases in 2011, which accounted for 48.2%000 incidence per 100,000 population, according to specialized literature. The breast cancer was diagnosed in 1700 patients in 2012 in a global scale, that makes 11.9% of total cases.

## **Aim**

The purpose of our study was to make a comparative investigation of the activity of antioxidative glutathione-dependent enzymes in the blood serum in the patients with breast dyshormonal hyperplasia (BDH) and breast cancer (BC).

## **Objectives**

1. Studying and making a analysis of the specialized literature about this pathology.
2. Examination of frequency of the patients with the breast dyshormonal hyperplasia (BDH) and breast cancer (BC).
3. The level of activity of antioxidative glutathione-dependent enzymes in the blood serum.

## **Methods**

The cohort study included 55 patients with breast dyshormonal hyperplasia (BDH) and breast cancer (BC) who were studied before treatment and 30 healthy women (a control group) in the Institute of Oncology in Republic of Moldova in the period 2009-2012. The average diagnostic ages of patients were  $48,5 \pm 16,5$  with limits between 32 and 65 years. In the blood serum were determined the glutathione reductase (GR), glutathione-S-transferase (GST), gamma-glutamyl transpeptidase (GGT). We determined the activity of enzymes using micromethods on a spectrophotometer "Humalyzer 2000" (Germany) by the method of E. Conn and A. Vennessland in our modification. Statistical processing of the results was performed according to the Student's method using the application package Microstat: Microsoft Excel 2003. The correlation coefficients were calculated according to the method Spearman.

## **Results**

The activity of GGT enzyme in all groups was varied from 21.17 U/L in patients with BDH to 25.01 U/L in patients with BC, versus with the enzyme activity in the control group (22.06 U/L). Also the activity of GST was increased in patients with BDH (1216.84 U/L) in comparison with the patients of the control group (480.81 U/L). The results of activity of the GR in patients with BDH and BC were higher than enzyme activity of healthy patients.

## **Conclusions**

The results reflect the interrelation between the activity of the pathological process and the imbalance of antioxidative defense in patients with mammary gland tumors.

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## HYDROGEN PEROXIDE FORMATION IN CELL CULTURE MEDIUM AFFECTS THE CYTOTOXIC BUT NOT ANTI-INVASIVE PROPERTIES OF PYROGALLOL DERIVATIVES IN C6 GLIOMA CELLS

*Saimonas Raudonius, Gintarė Stanaitytė, Kastytis Šidlauskas*  
 Supervisor of the abstract: *Julius Liobikas, Jurga Bernatoniene*  
 Neuroscience Institute, LSMU, Lithuania

### Introduction

Introduction Glioblastoma (GBM) is one of the most common and most malignant brain tumours. The main reasons behind the malignancy are the high rates of tumour growth and invasion of cancer cells to the normal brain tissue. Thus, despite the radical treatment including chemo-/radiotherapy and surgical resection, the median survival time of patients diagnosed with GBM is up to 11 months (1). For this reason, the development of new chemical agents to treat glial tumours is of high importance. Several studies have identified natural polyphenols as potential anticancer agents (2). These include a group known as anthocyanins and their respective phenolic acids. However, under in vitro conditions the chemical stability of anthocyanins, their aglycons and phenolic acids is limited (3). Under degradation, some polyphenols generate hydrogen peroxide that induces cell death. Therefore, the cytotoxic and cell growth inhibitory effects of certain polyphenols might be the subject of an artefact. Despite this, several studies have shown that some polyphenols have beneficial effects on the survival of animals in experimental tumour models (4,5). Hence, we speculated that the anti-invasive properties of polyphenols might contribute to this phenomenon significantly.

### Aim

Aims Hence, we aimed at determining whether cytotoxic and anti-invasive properties of three groups of polyphenols (the derivatives of pyrogallol, catechol, and phenol) in C6 glioma cells depend on the generation of hydrogen peroxide in culture medium.

### Objectives

1. Evaluate the cytotoxicity of polyphenols from three different groups (the derivatives of pyrogallol, catechol, and phenol) in C6 glioma cells and the primary cortical glial cells in vitro.
2. Determine the rates of hydrogen peroxide generation and molecular oxygen consumption of selected compounds in cell culture medium in order to evaluate their stability.
3. Evaluate the effect of suppressed accumulation of hydrogen peroxide by catalase on the cytotoxic potential of the selected polyphenols.
4. Assess the anti-invasive features of the selected polyphenols on glioma cells under the conditions of suppressed accumulation of hydrogen peroxide by catalase.

## Methods

The methods of our investigation include: C6 glioma cells were cultured in DMEM (Dulbecco's Modified Eagle Medium) supplemented with 10% fetal bovine serum and antibiotics; ·

The establishment of mouse primary glial cells from P5-10 mouse pups; ·

Double-staining (Hoechst33342 and propidium iodide) assay for cytotoxicity; ·

Quantification of hydrogen peroxide generation in cell culture media by the Amplex Red enzymatic assay.

High-resolution respirometer Oxygraph-2K (Oroboros®, Austria) was used to evaluate oxygen consumption rates in cell culture medium. ·

Invasion assays: wound scratch and sphere formation assays.

## Results

Results Derivatives of pyrogallol, including delphinidin and gallic acid, but not the derivatives of catechol (cyanidin and protocatechuic acid) or phenol (4-hydrobenzoic acid) were cytotoxic to C6 glioma cells. Moreover, pyrogallol derivatives induced cell death in the primary glial cell culture. Both pyrogallols, delphinidin and gallic acid, were highly unstable in the cell culture medium: they produced hydrogen peroxide and consumed molecular oxygen under degradation at high rates. The suppression of hydrogen peroxide accumulation by catalase diminished the cytotoxic effects of pyrogallol derivatives, but they still exerted anti-invasive properties in C6 glioma cells.

## Conclusions

1. The cytotoxic effects of the pyrogallol derivatives are not specific to cancer cells.
2. The derivatives of pyrogallol degrade in cell culture medium producing high levels of hydrogen peroxide.
3. The accumulation of hydrogen peroxide is responsible for the cytotoxic effect of the derivatives of pyrogallol. This indicates that the cytotoxicity is artefactual.
4. The anti-invasive features of the derivatives of pyrogallol do not depend on hydrogen peroxide accumulation. This implicates that there are other mechanisms of action. Overall, our results imply that pyrogallols are potential anticancer agents acting on the cancer cell invasion. However, further *in vivo* studies are needed.

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# VARIATIONS OF CERVICAL VERTEBRAE TRANSVERSE FORAMEN

*Tomas Mickevičius, Milda Šarkinaitė*

*Supervisor of the abstract: Rimvydas Stasys Stropus*

*Institute of Anatomy, LSMU, Lithuania*

## Introduction

Cervical vertebrae are unique because of their transverse foramen (TF). Sympathetic nerves, vertebral veins and vertebral arteries rise through them. It is very important to look at the vertebral artery (VA) and its' branches which supplies blood to the human brain. The pathway of the VA determines the area of TF. The wider VA is, the larger TF we get (1). The studies has shown that the diameters of TF varies among C1-C6. Starting from the entrance at the C6 to TF (2) and rising up to the C the area of each cervical vertebrae TF becomes bigger (3). Furthermore, the studies have shown that the area of each cervical vertebrae is greater on the left side than on the right side which means more intensive blood flow in the left VA (3). Moreover, anatomical structures that pass through TFs may influence unusual genesis of TF (e.g. on one side of the cervical vertebrae can be found two TFs, TFs may also be duplicated, etc.)(4). Therefore, the knowledge of cervical vertebra transverse foramen (TF) anatomical variations has importance for clinical anatomy of vertebral artery.

## Aim

To evaluate the transverse foramen size and shape variations of cervical vertebrae and their relationship between the right and left transverse foramen and cervical size itself.

## Objectives

1. To evaluate the area of TFs in three different groups: C1, C2 and C3-C6.
2. Compare the results between the right TFs and the left TFs.
3. To determine the correlation between the area of cervical body and TF on the right and on left side in C3-C6 group.
4. To determine the most frequent TFs shape variations.

## Methods

This study included 67 cervical vertebrae from Lithuania University of Health Sciences Institute of Anatomy which were investigated using KLONK Image Measurement Software, KLONK Denmark. We measured 10 cervical vertebrae in C1 group, 24 in C2 group and 33 in C3-C7 group. We measured transverse foramen area using images of each cervical vertebra. Comparisons were made between left and right side transverse foramen measurements. In addition we measured the body area of cervical vertebra and evaluated correlation between size of transverse foramen and the size of body of vertebra. Statistical analysis was done using SPSS 22.0. Data were analyzed statistically by Pearson and t-tests. All parametric results were explicated as mean  $\pm$  SD for each group. Local statistic significance was assumed as  $p < 0.05$  for all parameters.

## Results

1. The means and standard deviations (SDs) of transverse foramina area were equal to  $4,39 \pm 0,23 \text{mm}^2$  on the right and  $4,60 \pm 0,31 \text{mm}^2$  on the left side of cervical vertebrae in C1 group. The means and SDs of transverse foramina area were equal to  $4,61 \pm 0,31 \text{mm}^2$  on the right and  $4,71 \pm 0,48 \text{mm}^2$  on the left side of cervical vertebrae in C2 group. The means and SDs of transverse foramina area were equal to  $2,96 \pm 0,12 \text{mm}^2$  on the right side and  $3,28 \pm 0,26 \text{mm}^2$  on the left side of cervical vertebrae in C3-C6 group. Nonetheless, these parameters were not significant at all levels.

2. The moderate correlation between the area of cervical vertebrae bodies ( $27,18 \pm 1,01 \text{mm}^2$ ) and the right TFs was found ( $r=0,399$ ). Also the medium correlation was found between the cervical vertebrae bodies and the left ( $r=0,526$ ) TFs was found ( $r=0,526$ ). Significance was found measuring the correlation between the area of the bodies and TFs on both sides ( $p < 0,05$ ).

3. There was the most cervical vertebrae with two TFs - 8(11,94%) cervical vertebrae, from which 4(5,97%) were bilateral and 4 (5,97%) were mono lateral. There were also 7(10,45%) cervical vertebrae with double TFs from which 4(5,97%) were bilateral and 3(4,48%) were monolateral. There was 1(1,49%) cervical vertebra with highly asymmetrical TF.

### **Conclusions**

- 1.The widest area of TF was detected in C2 group. The smaller area was found in C1 group and the smallest in C3-C6 group.
2. After comparing areas of the right and the left TFs in all of the groups asymmetry was found: the wider diameters were found on the left side. No significant difference was found between the right and left TF in any of the groups ( $p > 0.05$ ).
3. The moderate correlation between the area of TFs and cervical vertebrae body area was found in C3-C6 group.
- 4.The most frequent shape variation was the double TF in the C3-C6 group.

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## CARDIOLOGY SESSION

# 3D AND SPECKLE TRACKING ECHOCARDIOGRAPHY APPLICATION FOR EARLY IDENTIFICATION OF LEFT VENTRICULAR REMODELLING AFTER MYOCARDIAL INFARCTION

*Arnas Karužas, Eglė Ruzgytė*

*Supervisor of the abstract: Diana Žaliaduonytė – Pekšienė*

*Department of Cardiology, LSMU, Lithuania*

## Introduction

Cardiac remodeling is generally accepted as a determinant of the clinical course of heart failure. Left ventricular (LV) remodelling after acute myocardial infarction (AMI) comprises infarct expansion, LV dilatation, and hypertrophy [1]. Three-dimensional (3D) echocardiographic (3DE) imaging represents an innovation in cardiovascular ultrasound. The usefulness of 3D echocardiography has been demonstrated in the evaluation of cardiac chamber volumes and mass, which avoids geometric assumptions [2]. Speckle-tracking echocardiography (STE) has emerged also as a novel technique for LV functional assessment [3]. It's important to determine the future prognostic values for LV remodelling after AMI.

## Aim

To evaluate LV myocardial prognostic remodelling parameters after AMI by 3DE and STE.

## Objectives

1. To evaluate 3DE end-diastolic volume (EDV), end-systolic volume (ESV), ejection fraction (EF) and systolic dyssynchrony index (SDI) as remodelling predictors.
2. To assess the value of LV torsion, twist, circumferential strain (SC), radial strain (SR), longitudinal strain (SL) and 3D sphericity index (SI) in LV remodelling prediction.

## Methods

A prospective study where 81 AMI patients were included and underwent 3DE and STE examination at baseline and at 6 month follow-up. Consecutive patients who met the following inclusion criteria were eligible to enter the study: patients with ST-elevation AMI, as evidenced by symptoms, ECG changes, and serial troponin I concentrations. LV remodelling was defined as a  $\geq 15\%$  increase in the LV end-diastolic volume at follow-up compared with the baseline. Statistical analysis performed using IBM SPSS Statistics 22 software package. The Kruskal-Wallis non-parametric analysis of variance used to compare 3DE parameters among the different remodelling. The sphericity index (EDV divided by the volume of a sphere, the diameter of which is the LV major end-diastolic long axis), EDV and other parameters as remodelling indicators evaluated by using ROC curves. A subject assessed as positive or negative according to whether the parameter value was greater than, less than, or equal to a given cut off value. Associated with any cut off value was the probability of a true positive (sensitivity) and the probability of a true negative (specificity). Commonly used index of accuracy is area under the ROC curve (AUROC), values close to 1.0 indicating high diagnostic accuracy. Pearson coefficients of correlation and their associated probability (p) used to evaluate the relationship between 3DE and STE parameters. Differences considered as statistically significant when the p value was less than 0.05.

## Results

At follow-up, 22 patients (27%) were classified as having LV remodelling. The Kruskal-Wallis analysis results were evaluated and determined significant difference between EDV in patients with LV remodelling (med=115,2ml (53,3–156,9)) and without (med= 140,9ml (66,3–255,95)) (p = 0,006), ESV in patients with LV remodelling (med=66,9ml (35,28–111,63)) and without (med=89ml (25,9–139,2)) (p = 0,003), SI in patients with LV remodelling (med=0,43 (0,23–0,66)) and without (med=0,31 (0,14–0,74)) (p = 0,001), SDI in patients with LV remodelling (med=4,75% (2–

11,1)) and without (med-3,6% (0,5-8,1)) ( $p = 0,034$ ). Other 3DE and STE parameters had no significant difference ( $p > 0,05$ ).

The diagnostic value of 3DE and STE parameters for LV remodelling was evaluated by ROC curves and logistic regression based on the EDV, ESV, EF, SDI, SI distribution according to remodelling and ROC curves, the best discriminant cut off levels were determined (positive predictive value of at least 90%). 3DE parameters – EDV ( $p = 0,005$ ), ESV ( $p = 0,004$ ), SDI ( $p = 0,034$ ) had statistically significant prognostic value for LV remodelling. Cut off level of EDV for prediction of LV remodelling was 115,29 ml (sens.–63%, specif.–70%, AUROC 0,554), of ESV–69,82 ml (sens.–72%, specif.–56%, AUROC 0,521), of SDI–4,2% (sens.–62%, specif.–74%, AUROC 0,640). EF had no significant predictive value ( $p > 0,05$ ).

Cut off level of SI for LV remodelling was 0,431 (sens.–67%, specif.–71%, AUROC 0,687). STE parameters: LV torsion, twist, SC, SR, SL had no statistical significance in predicting LV remodelling ( $p > 0,05$ ).

### Conclusions

1. 3DE end-diastolic volume, end-systolic volume, ejection fraction and systolic dyssynchrony index had statistically significant predictive value for LV remodelling at 6 month period after AMI.
2. According to area under the ROC curve the strongest predictive value for LV remodeling had 3D sphericity index. STE parameters had no statistically significant predictive values.

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## A CROSS-SECTIONAL SURVEY IN VILNIUS UNIVERSITY SANTARISKIU CLINICS OF ATRIAL FIBRILLATION ANTICOAGULATION MANAGEMENT

*Deimile Balkute, Justina Alunderyte*

*Supervisor of the abstract: Gediminas Rackauskas*

*Department of Cardiology, Vilnius University, Lithuania*

### Introduction

The aging of population has become a significant problem in European nation. According to Eurostat data, until 2060 the number of people, older than 65 years, is going to increase to 31,2 percent of Lithuania's population (1). One of the most frequent disease associated with aging, is atrial fibrillation (AF). The recent projections estimate that from 2010 to 2060 the number of adults 55 years and over with AF in the European Union will be more than double (2). This increase would have major public health implications, while the most common arrhythmia is associated with a five-fold risk of stroke and three-fold incidence of congestive heart failure, and higher mortality (3). It became a medical, economic and social burden.

### Aim

To analyze stroke and bleeding risk as well as anticoagulation in patients with AF in Vilnius University Santariskiu clinics.

### Objectives

- To evaluate stroke risk using CHA2DS2-VASc score

- To evaluate bleeding risk using HAS-BLED score
- To analyze adherence to the guidelines and the outcomes

### Methods

The study was conducted in Vilnius University Santariskiu clinics in the period from November 2013 to February 2014. Both the primary and secondary recorded AF diagnosis of AF was included. Patients did not need to be in AF at the time of enrolment. A prepared questionnaire was used to collect the information about the risk factors, co-morbidities, medications and invasive treatment. CHA<sub>2</sub>DS<sub>2</sub>-VASc score for stroke risk and HAS-BLED score for bleeding risk assessment was calculated. Patients were classified into four groups according to AF type. Comparison between groups was made. Univariate analysis was applied to both continuous and categorical variables. Continuous variables were expressed as a mean ± standard deviation. Among - group comparisons were made by using Pearson's correlation coefficient and linear regression. Categorical variables were reported as percentages. Among - group comparisons were made by using Chi - squared test or a Fischer's exact test if any expected cell count was  $p$  - value less than 0,05 was considered as significant. Statistical analysis was performed using SPSS 19 software.

### Results

We enrolled 258 patients (51,9% female, mean age 71 years (SD ± 11). 8 (3,1%) subjects were diagnosed lone AF, 50 (19,4%)- paroxysmal, 89 (34,5%) - persistent, 111 (42,8%) - permanent AF type. Long - standing persistent AF was not diagnosed. There were no statistically significant differences of risk factors, co - morbidities among AF groups. According to CHA<sub>2</sub>DS<sub>2</sub>-VASc score, stroke risk was highest for patients with permanent AF: lone AF average score was 3,75 SD ± 3,12, paroxysmal 3,76 SD ± 1,76, persistent -3,88 SD ± 1,81, permanent 4,44 SD ± 1,5 ( $p = 0,046$ ). Only 152 (60,8%) patients with CHA<sub>2</sub>DS<sub>2</sub>-VASc score above 1 used oral anticoagulants (OACs). It was the most frequently used in permanent AF group - 78 (71,6%) ( $p < 0,01$ ). Only 34 (25,4%) patients , who were taking warfarin, had INR in therapeutic range. The highest bleeding risk had patients with permanent AF: mean HAS-BLED score was 1,75 SD ± 1,04 in the lone AF group, 1,86 SD ± 1,01 in paroxysmal, 2,19 SD ± 1,17 in persistent, 2,37 SD ± 1,09 in permanent AF group ( $p = 0,031$ ). 3 (9,4%) subjects were taking aspirin instead of OACs even though HAS-BLED score was higher than 3.

### Conclusions

Patients with permanent AF have higher CHA<sub>2</sub>DS<sub>2</sub>-VASc as well as HAS-BLED scores than patients with persistent and paroxysmal AF. More of them use warfarin than in the other groups. Just small part of the patients on warfarin had INR in a therapeutic range. Compliance with the treatment guidelines remains suboptimal.

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# ACCURACY OF PARAMETERS IDENTIFYING EARLY LEFT VENTRICULAR REMODELLING AFTER MYOCARDIAL INFARCTION COMPARED IN 3D AND 2D ECHOCARDIOGRAPHY

*Arnas Karužas, Eglė Ruzgytė*

*Supervisor of the abstract: Diana Žaliaduonytė-Pekšienė*

*Department of Cardiology, LSMU, Lithuania*

## Introduction

Transthoracic two-dimensional echocardiography (2DE), for obvious reasons, has played an important role for determining myocardial remodelling after acute myocardial infarction (AMI). Calculation of left ventricular (LV) volume by three-dimensional echocardiography (3DE), however, is up to three times more accurate than 2DE [1]. Volumetry by 2DE depends on geometric assumptions and is subject to image-plane positioning errors. Hence, it is not accurate in LVs that are distorted in shape, such as after AMI [2]. The main goal is to provide a practical guide on how to acquire, analyze, and display the various cardiac structures using 3D echocardiography, because of the limitations of the technique [3].

## Aim

The aim of the study was to measure serial changes in LV volumes and ejection fraction (EF) after AMI and to identify 3DE criteria and compare with 2DE criteria that could predict the subsequent development of LV remodelling.

## Objectives

1. To evaluate which of the 3DE or 2DE parameters have better accuracy for predicting LV remodelling after AMI.
2. To evaluate possible correlation between 2DE and 3DE parameters in prognosis of LV remodelling.

## Methods

This was a prospective study where 81 AMI patients were included and underwent 2 DE and 3DE at baseline within 3 days and at 6 months. Patients who met the following inclusion criteria were eligible to enter the study: patients with ST-elevation AMI, as evidenced by symptoms, ECG changes, and serial troponin I concentrations. LV remodelling was defined as a  $\geq 15\%$  increase in the LV end-diastolic volume at follow-up compared with the baseline by 3DE and 2DE methods. A good quality views of 2DE were evaluated. Statistical analysis performed using IBM SPSS Statistics 22 software package. The Kruskal-Wallis non-parametric analysis of variance and Student's T-test used to compare 3DE and 2DE parameters. The 2DE, 3DE parameters (end-systolic, end-diastolic volumes, EF) as indicators of LV remodelling were assessed using ROC curves. A subject determined as positive or negative according to whether parameter value was greater than, less than, or equal to a given cut off value. Associated with any cut off value was the probability of a true positive (sensitivity) and the probability of a true negative (specificity). Commonly used index of accuracy is area under the ROC curve (AUROC), values close to 1.0 indicating high diagnostic accuracy. Spearman coefficients of correlation and their associated probability (p) used to evaluate the relationship between 3DE and 2DE parameters. Differences were considered as statistically significant when p value was less than 0.05.

## Results

Using 2DE method, LV remodelling was identified in 34 patients (42%) and using 3D method – in 22 patients (27%). It was found that remodelling evaluation by 2DE and 3DE had significant difference ( $p < 0,001$ ).

The results of the Kruskal-Wallis and Student's T-test analysis revealed that EDV measured by 3DE was larger than EDV measured by 2DE ((132,78 ml (SD 41,6) vs. 87,18 ml (SD 18,3),  $p < 0,001$ )) as well as ESV measured by 3D was also larger than ESV assessed by 2D (81,7 ml ((SD 21,3) vs. 41,8 ml (SD 13,4),  $p < 0,001$ )). EF assessed by 3DE was lower than EF measured by 2DE method((38,4% (SD 9,6) vs. 52,2% (SD 7,7),  $p = 0,021$ )).

The diagnostic value of 2DE and 3DE parameters for LV remodelling was evaluated by ROC curves and logistic regression. 2DE parameters (EDV, ESV, EF, left ventricle end-diastolic size) had no significant prognostic value for LV remodelling ( $p > 0,05$ ). 3DE parameters – EDV ( $p = 0,005$ ), ESV ( $p = 0,004$ ), sphericity index (SI) ( $p = 0,001$ ) had statistically significant prognostic value for LV remodelling. Based on these parameters distribution according to remodelling and ROC curves the best discriminant cut off levels determined (positive predictive value of at least 90%). Cut off level of SI for remodelling was 0,431 (sens. – 67%, specif. – 71%, AUROC 0,687), of EDV – 115,29 ml (sens. – 63%, specif. – 70%, AUROC 0,554), of ESV – 69,82 ml (sens. – 72%, specif. – 56%, AUROC 0,521). 2DE and 3DE parameters such as EDV, ESV and EF significantly correlated as follows:  $r = 0,489$ ,  $r = 0,402$ ,  $r = 0,40$  (in all,  $p < 0,001$ ).

### Conclusions

1. Three-dimensional echocardiography parameters such as EDV, ESV and SI had statistically significant accuracy for predicting LV remodelling after AMI compared to the parameters measured by two-dimensional echocardiography.
2. Three-dimensional and two-dimensional echocardiography parameters significantly correlated, this is why 3DE requires a good quality 2DE views for parameter evaluation.

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## ASSOCIATION BETWEEN CLINICAL PARAMETERS AND ST-SEGMENT RESOLUTION AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION

*Povilas Budrys, Martynas Jurėnas*  
Supervisor of the abstract: *Ramūnas Unikas*  
Department of Cardiology, LSMU, Lithuania

### Introduction

Primary percutaneous coronary intervention (PPCI) is the method of choice to treat patients with acute ST-segment elevation myocardial infarction (STEMI). The success of PPCI, used to treat patients with STEMI, can be determined electrocardiographically by measuring ST-segment resolution (STR) after procedure or angiographically by evaluating Thrombolysis in Myocardial Infarction (TIMI) flow. However, good epicardial blood flow does not necessarily imply adequate perfusion at the myocyte level. STR reflects the physiology of myocytes, which are the final target of coronary blood flow. That is why monitoring STR after successful primary PCI is probably the most convenient method to assess if appropriate perfusion is achieved in the heart microvessels.

### Aim

The aim of the present study was to evaluate and compare clinical parameters between complete STR and incomplete STR patients groups and to identify clinical predictors and their impact to the STR.

## Objectives

1. Compare clinical parameters between complete STR and incomplete STR patients groups.
2. Identify clinical parameters which were associated with ST-segment resolution.
3. Determine clinical predictors for incomplete ST-segment resolution.

## Methods

Consecutive 203 patients with acute STEMI who underwent PPCI since Dec. 1st 2013 till Aug. 31st 2014 in Kaunas Clinics of Lithuanian University of Health Sciences were enrolled in the study. The STR was measured in ECGs registered 5-15 min after PPCI. Patients were divided into two groups according to the degree of STR: <70% (incomplete resolution) and  $\geq 70\%$  (complete resolution). The cardiovascular risk factors, sex, Killip class, TIMI flow, symptom-onset-to-balloon time and door-to-balloon time, and major adverse cardiovascular events were assessed and compared between two groups.

Continuous variables were expressed as median (25th-75th percentiles). Mann-Whitney test was used to compare continuous variables between categorical data groups. Categorical variables were compared using a  $\chi^2$  test. To determine the independent predictors of ST-segment resolution, multiple linear regression analysis was performed for the following parameters: sex, cardiovascular risk factors, symptom onset-to-balloon time, door-to-balloon time, myocardial infarction (MI) location, Killip class, presence of 100% occlusion of the infarct artery, number of damaged vessels, thrombus aspiration, TIMI flow before and after PCI, distal embolization. A multivariate logistic regression analysis was performed to ascertain the effects of the variables mentioned above on the likelihood for the patients to have incomplete STR.

## Results

There were 147 (72.4%) patients with incomplete STR (<70%), and 56 (27.6%) patients with complete STR. Patients with complete STR were younger: 60y/o (51.3-71) vs 68y/o (58-76),  $p < 0.01$ , had lower Killip class ( $p < 0.05$ ), were less likely to have anterior MI: 17.9% vs 63.3%,  $p < 0.01$ . Patients with incomplete STR had longer symptom onset-to-balloon (5.5h (3-12) vs 2h (2-4), respectively,  $p < 0.01$ ) and door-to-balloon (60min (40-90) vs 45min (30-60), respectively,  $p < 0.01$ ) intervals. TIMI before PCI did not differ across two groups. However recovery of TIMI 3 after PCI was more common in complete STR group (all patients with complete STR had TIMI 3 after PCI compared to 78.1% in incomplete STR group,  $p < 0.01$ ). During hospital stay 9 patients (6.1%) died in incomplete STR group and 1 patient (1.8%) in complete STR group ( $p = 0.2$ ). Patients in complete STR group stayed in hospital shorter: 7d (6-9) vs 8d (7-10),  $p < 0.05$ . Multiple linear regression analysis demonstrated that TIMI 2 or less after PCI (beta coeff. -28.6,  $p < 0.05$ ), anterior MI (beta coeff. -28.6,  $p < 0.01$ ) and symptom onset-to-balloon time (beta coeff. -0.9,  $p < 0.05$ ) were inversely associated with STR. Multivariate logistic regression analysis determined that anterior MI (odds ratio (OR) = 29.9, 95% confidence interval (CI) 7.6-117.8,  $p < 0.01$ ), symptom onset-to-balloon time (OR = 1.7, CI 1.3-2.2,  $p < 0.01$ ) and patient's age (OR = 1.07, CI 1.01-1.13,  $p < 0.05$ ) were associated with an increased likelihood of having incomplete STR.

## Conclusions

1. Patients with complete ST-segment resolution were younger, had lower Killip class, shorter duration of the chest pain, were less likely to have anterior myocardial infarction, were more likely to achieve successful recovery of TIMI flow grade 3 after PCI and spend less time in hospital compared with the patients with incomplete ST-segment resolution.
2. TIMI flow grade 2 or less after PCI, anterior wall myocardial infarction and symptom onset-to-balloon time were inversely associated with ST-segment resolution.
3. An increased likelihood of having incomplete ST-segment resolution had older patients with anterior myocardial infarction and longer symptom onset-to-balloon time.

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## BIOABSORBABLE CORONARY ARTERY STENTS – RESULTS OF ONE YEAR TREATMENT: PILOT STUDY

*Justas Keršulis, Robertas Pranevičius, Ažuolas Sirtautas*

*Supervisor of the abstract: Ramūnas Unikas*

*Cardiology department, Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Lithuania*

### Introduction

Bioabsorbable stents - bioresorbable vascular scaffolds (BVS) are a relatively new technology, which has many upsides when comparing it to metallic stents. After doing its function (revascularisation) it also repairs the wall of the artery and then absorbs. It basically overcomes all of the downsides, which come from using metallic stents (avoiding the loss of normal vasomotion, coronary artery thrombosis, improving endothelial function and no need for long term anti-platelet therapy). In long-term tests, bioabsorbable stents showed better performance and faster vascular recovery when compared to metal stents. In this pilot study we tried to see the nearest complications and evaluate the efficiency of the new bioabsorbable stents.

### Aim

Evaluate treatment results of the patients that have been treated with BVS.

### Objectives

1. Evaluate the rate of complications for patients that have been treated with BVS.
2. Evaluate the need for a repeated revascularization in patients with BVS.

### Methods

Data of patients who have been treated with BVS stents, is stored and analyzed using retrospective survey. There were 21 consecutive patients, who have suffered from ischaemic heart disease in our survey. First of all, risk factors of our patients were collected (diabetes, hypertension, smoking). Coronarography and stenting with bioabsorbable stents was performed on all of these patients. Patients were observed while still in hospital and after three months and after one year after discharge from the hospital in case complications – major adverse cardiac events (MACE - death, thrombosis, myocardial infarction, stroke). Also, we evaluated length of hospitalisation and need for repeated revascularization. Data has been analyzed using SPSS V22.0 (Chi - squared test).

### Results

The inconsiderable amount of patients did not let us find the statistically significant differences between the participants of the study. Age mean of patients which participated in the study was 57 years of which 11 were males and 10 were females. More than half (71,4%) of participants had stabile angina pectoris with one vessel disease (47.6%), two vessel disease (23.8%), three vessel disease (28.5%). To determine the complexity of coronary artery disease we used the Syntax score and 47.6% of study participants had score more than 10 points. The risk factors such as arterial hypertention (95,2%) , diabetes (4.7%) , smoking (14.2%) , dyslipidemia (76.1%) were also evaluated. The study analyzed the most suitable technique aspects : 47.6% of patients had a long 28mm length stent with 3.5mm

diameter. None of the complications were observed during one year period of time. The mean of hospitalisation time was  $6.25 \pm 2.58$  days.

### Conclusions

1. Patients have had none of the complications during one year time.
2. There was no need for repeated revascularization for patients who had been treated using bioabsorbable stents during one year period of time.

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## COMPARISON OF CHRONIC HEART FAILURE TREATMENT IN LITHUANIA AND OTHER EUROPEAN CENTRES PARTICIPATING IN EUROBSERVATIONAL RESEARCH PROGRAMME

*Rasa Sadeckaitė, Kristina Vasiljevaitė, Goda Maciulevičiūtė*

*Supervisor of the abstract: Aušra Kavoliūnienė*

*Department of Cardiology, LSMU, Lithuania*

### Introduction

According to current guidelines heart failure (HF) treatment with three main neurohormone blockers – angiotensin converting enzyme inhibitors (ACE inhibitors)/angiotensin receptor blockers (ARBs), beta-blockers (BBs), mineralcorticoid receptors antagonists (MRAs) and also with diuretics is now the standard of care for stable chronic heart failure (CHF) patients. Analysis is useful to evaluate HF treatment and to identify if there is a gap between current recommendations and actual clinical practice.

### Aim

To compare pharmacotherapy of ambulatory CHF patients in one of Lithuania’s university centres and other European centres participating in EURObservational Research Programme (EORP) Heart failure Long-term registry (HFLTR).

### Objectives

To compare the usage of ACE-inhibitors/ARBs, BBs, MRAs, diuretics in Lithuania and other European registry centres.

### Methods

Patients were entered in the HFLTR registry on a one-day-per-week basis. Follow-up (FU) data were registered one year later based on a visit to the clinical centre after 12 months or FU by phone. In total, 240 patients from our university centre were entered in the registry as ambulatory patients with CHF from May 2011 to March 2012. In total, 7401 CHF patients from 211 other European centres have been enrolled in EORP HFLTR. Registered data includes information about patients current treatment.

Continuous variables are reported as median and interquartile range (IQR). Categorical variables are reported as

percentages and compared using the  $\chi^2$  test. Continuous variables are compared by the t-test or the Mann-Whitney U-test. A P-value of 0.05 was considered statistically significant. All tests were two-sided. Analysis was performed with SPSS 22 program.

### Results

ACE inhibitors were prescribed to 67,1% of patients in the Lithuanian centre and 67% in other European cardiology centres ( $p = 0,975$ ). For those intolerant to ACE inhibitors, ARBs were prescribed more often in other international HF registry centres (23,9% vs. 16,7%,  $p = 0,009$ ).

BBs were prescribed to a big proportion of patients, but significantly less in the Lithuanian centre (82.5% vs. 88.9%,  $p = 0.002$ ). Metoprolol was more often used in our centre than in other EORP HFLTR centres (51,2% vs 11%,  $p = 0,001$ ) and contrarily, bisoprolol was more frequently prescribed in cardiology centres from other European countries (40,8% vs. 1,3%,  $p = 0,001$ ) as well as carvedilol was (40,7% vs. 25%,  $p = 0,001$ ).

MRA spironolactone was prescribed to 58,6% of patients in our centre and 67% in other European centres ( $p = 0,025$ ). Selective MRA eplerenone was only used occasionally – in 0.4% cases, while this medication was prescribed to 23.7% patients of other European centres ( $p = 0,001$ ).

A large proportion of patients (71,7%) were treated with diuretics in our centre and even higher percentage (83.1%) was observed in other European cardiology centres ( $p = 0,001$ ).

### Conclusions

1. No difference in treatment with angiotensin converting enzyme inhibitors have been defined in Lithuanian and other European centres.
2. Prescription of beta blockers was lower in Lithuania in comparison with other European centres.
3. The usage of mineralcorticoid receptors antagonists was higher in other European centres in comparison with single university centre of Lithuania.
4. Our centre has significantly less stable heart failure patients with diuretic therapy in contrast to European data as it is recommended by current guidelines.

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## DIFFERENCES IN MITRAL ANNULUS REMODELING IN ACUTE ANTERIOR ST ELEVATION AND ACUTE INFERIOR ST ELEVATION MYOCARDIAL INFARCTION

*Ažuolas Sirtautas*

*Supervisor of the abstract: Živilė Valuckienė, Renaldas Jurkevičius  
Lithuanian University of Health Sciences; Medicine, Lithuania*

### Introduction

Myocardial infarction is known to account for left ventricular remodelling and mitral annular distortion.

## Aim

To assess and compare morphometric changes of mitral annulus in patients presenting with acute anterior or inferior myocardial infarction.

## Objectives

- 1) To assess anteroposterior and septolateral annular dimension of mitral annulus in patients with acute MI;
- 2) To assess mitral annular area and annular contraction in patients with acute MI;
- 3) To evaluate parameters reflecting mitral apparatus (chordal length, chordal papillary muscle distance, etc.);
- 4) To compare differences in mitral annular geometry between patients with anterior and inferior MI.

## Methods

Echocardiographical data of 30 patients with an anterior ST elevation myocardial infarction and data of 30 patients with an inferior ST elevation myocardial infarction on an acute stage was collected, evaluated and compared.

Parameters used:

- 1) Mitral annulus parameters: mitral annulus systole and diastole, systolic and diastolic annular area, annular contraction.
  - 2) Mitral valve muscle parameters: distance from anterolateral muscle to anterior leaflet, distance from anterolateral muscle to posterior leaflet, perpendicular of anterolateral muscle to mitral annulus.
- Parameters were measured on 4 chamber and parasternal long axis views of the heart. Collected data was analysed and compared to acute posterior wall myocardial infarction data using SPSS (calculating mean and using Wilcoxon criteria).
- 3) Data was collected using EchoPAC software to measure mitral annulus.
  - 4) Collected data was analyzed and compared to acute posterior wall myocardial infarction data using SPSS (calculating mean and using Wilcoxon criteria).

## Results

Four chamber view (anterior MI vs. inferior MI)(written values show size in millimeters): Mitral annulus (MA) diastole: 32,573-39,089 mm ( $p = 0.000$ ) (size of mitral annulus in diastole is smaller in patients with anterior MI), MA systole: 30,935-36,223 mm ( $p = 0.000$ ) (size of mitral annulus in systole is smaller in patients with anterior MI), MA diastolic area: 8.335-12.115 mm<sup>2</sup> ( $p = 0.000$ ) (size of MA diastolic area is smaller in patients with anterior MI), MA systolic area: 7.577-10.146 mm<sup>2</sup> ( $p = 0.001$ ) (size of MA systolic area is smaller in patients with anterior MI), MA contraction: 0.835-1.698 ( $p = 0.000$ ) (MA contraction is weaker in patients with anterior MI).

Parasternal view (anterior MI vs. inferior MI): MA diastole: 33.558-36.008 mm ( $p = 0.003$ ) (size of mitral annulus in diastole is smaller in patients with anterior MI) , MA systole: 31.182-34.052 mm ( $p = 0.005$ ) (size of mitral annulus in systole is smaller in patients with anterior MI), MA diastolic area: 8.876-10.136 mm<sup>2</sup> ( $p = 0.003$ ) (size of MA diastolic area is smaller in patients with anterior MI) , MA systolic area 7.662-9.273 mm<sup>2</sup> ( $p = 0.004$ ) (size of MA systolic area is smaller in patients with anterior MI) , MA contraction 1.214-1.040 ( $p = 0.153$ ) (MA contraction is stronger in patients with anterior MI than in patients with inferior MI).

## Conclusions

Inferior myocardial infarction accounts for early mitral annular dilatation compared to patients with anterior myocardial infarction.

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## EFFICACY AND BENEFIT OF PULMONARY VEIN ISOLATION IN PATIENTS WITH ATRIAL FIBRILLATION: A PROSPECTIVE COHORT STUDY

*Justinas Bacevičius*

*Supervisor of the abstract: Juha Hartikainen, Antti Hedman  
Vilnius University, Faculty of Medicine, Lithuania*

### Introduction

Catheter ablation of symptomatic paroxysmal atrial fibrillation (AF) is recommended in patients who have symptomatic recurrences of AF on antiarrhythmic drug (AAD) therapy<sup>[1][2]</sup>. However, the efficacy of treatment with pulmonary vein isolation (PVI) varies between 50% and 75% worldwide<sup>[3]</sup>.

### Aim

To investigate long-term outcomes, benefits and complications after PVI.

### Objectives

1. To describe long-term outcomes.
2. To determine predictors of long-term outcomes.
3. To evaluate AAD treatment before and after ablation for patients with no arrhythmia recurrence.
4. To assess early and late major complications.

### Methods

Study included symptomatic paroxysmal or persistent AF patients refractory to at least one AAD (n = 202) (age 58,2 ± 8,1 yrs.; males 74,3%). Individuals were performed with PVI applying Stereotaxis remote robotic navigation and Carto electroanatomic mapping in Heart center of Kuopio University Hospital 2009-2014. Follow-up was a multi-center co-operation receiving data from district of Northern Savo. All subjects (n = 202) after 12 months were evaluated by clinical symptoms: no symptoms (referred as no arrhythmia recurrence), decreased clinical symptoms, the same clinical symptoms, increased clinical symptoms (the latter three attributed to arrhythmia recurrence). Statistical methods used: Student's T test, ANOVA, Mann-Whitney U, Chi square, Fisher exact test.

### Results

- 1) Outcome after 12 months: no arrhythmia recurrence 67,8% (n = 137), arrhythmia recurrence with decreased clinical symptoms 27,2% (n = 55), the same clinical symptoms 4,5% (n = 9), increased clinical symptoms 0,5% (n = 1). Re-do PVI was performed for 20,8% (n = 42) subjects.
- 2) No arrhythmia recurrence rate for paroxysmal AF 66,9% (n = 121) was lower than for persistent AF patients 76,2% (n = 16) (p = 0.386). Re-do PVI was more common for persistent 33,3% (n = 7) than for paroxysmal AF 19,3% (n = 35) (p = 0,156). However, sinus rhythm (SR) outcome rate after primary PVI 67,5% (n = 108) did not differ significantly from

re-do PVI 66,7% (n = 28) (p = 0,101). Patients with SR after PVI had smaller left atrium (LA) Area ( $22,1 \pm 3,5$  cm<sup>2</sup>) (n = 106) than patients who had arrhythmia recurrence ( $24,7 \pm 7,3$  cm<sup>2</sup>) (n = 42) (p < 0,01). LA Area of >35 cm<sup>2</sup> was a predictor of arrhythmia recurrence after PVI (RR 3,8 [2,9-5,0], p < 0,001). Patients with SR (n = 122) had lower radiation dose (median 2188,9 mGy, IQR 871,3) than patients resulting in arrhythmia recurrence (n = 54) (median 2602,6 mGy, IQR 1531,7) (p < 0,01). No other demographic or periprocedural parameters correlated with outcome.

3) Among 67,8% (n = 137) patients who had no arrhythmia recurrence: AAD before ablation was used for 69,3% (n = 95) compared to 17,5% individuals after ablation (n = 24) (p < 0,001).

4) Early major complications included cardiac tamponade 1,0% (n = 2) and respiratory failure due to dexmedetomidine sedation 0,5% (n = 1). Patients who underwent cardiac tamponade (n = 2) had non-successful early result of PVI (p < 0,01). No major late complications were reported.

### Conclusions

Pulmonary vein isolation is an effective, beneficial and safe way of treatment in patients with symptomatic refractory atrial fibrillation. Left atrium area is an independent predictor of long-term outcome after ablation procedure.

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## FEASIBILITY TO EVALUATE MYOCARDIAL SCAR TRANSMURALITY IN PATIENTS WITH INFERIOR MYOCARDIAL INFARCTION USING CARDIOVASCULAR MAGNETIC RESONANCE FEATURE TRACKING

*Paulius Bučius, Augustinas Povilas Fedaravičius*

*Supervisor of the abstract: Tomas Lapinskas*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

The quantification of myocardial scar transmuralty (MST) and contractile dysfunction after myocardial infarction (MI) has an important prognostic value. [1] The myocardial deformation parameters (strain, strain rate, velocity and displacement) of the left ventricle (LV) derived from cardiovascular magnetic resonance feature tracking (CMR-FT) on standard cine images have been shown to be useful in the assessment of regional myocardial function of injured segments. [2,3,4] However, data evaluating feasibility to assess MST based on CMR-FT alone are lacking.

### Aim

The aim of the study was to evaluate the feasibility to determine MST in patients with inferior MI using CMR-FT.

### Objectives

- 1) To compare regional myocardial deformation parameters in MI and control groups;
- 2) To determine the most accurate functional parameters for prediction of injured myocardial segments.

## Methods

Twenty-four patients with inferior MI and 15 healthy controls underwent CMR study. Myocardial deformation parameters (strain, strain rate, velocity and displacement) were analyzed using dedicated software (CPA MR, TomTec, Germany) in two, three and four chambers as well as in short-axis cine images at the basal, midventricular and apical levels. Assessment of MST was performed visually using late gadolinium enhancement images and classified into three separate groups (no scar,  $\leq 50\%$  MST and  $> 50\%$  MST). Data were processed with IBM SPSS Statistics 21 and MS Excel software.

## Results

Non-parametric Mann-Whitney U Test yielded statistically significant differences in the following deformation variables: radial strain ( $p < 0.001$ ), radial strain rate ( $p = 0.001$ ), circumferential strain ( $p = 0.002$ ), radial velocity ( $p < 0.001$ ) and radial displacement ( $p = 0.002$ ).

The analysis of the ROC curves for functional measurements demonstrated that largest area under the curve can be attributed to the following parameters: radial strain, radial velocity and radial displacement.

The assumption of no multicollinearity between variables was confirmed by performing the parallel lines test with following results: value of  $\chi^2$  statistic = 0.000,  $df = 11$ ,  $p = 1.000$ . The goodness-of-fit of the chosen model is demonstrated by the values of the maximum likelihood Chi square criterion ( $\chi^2 = 73.597$ ;  $df = 11$ ;  $p = 0.00$ ), as well as by Pearson's ( $\chi^2 = 8.513$ ;  $df = 65$ ;  $p = 1.000$ ) and Deviance ( $\chi^2 = 12.317$ ;  $df = 65$ ;  $p = 1.000$ ) Chi square criteria.

Nagelkerke's determination coefficient is equal to 1.000. Using the chosen analysis method, statistically significant estimates for the logistic regression function were obtained and used for the classification of myocardial segments according to the MST. The resulting prediction accuracy was found to be 97.4%. The limitation of our analysis was the small number of myocardial segments with  $\leq 50\%$  MST.

## Conclusions

- 1) Non-parametric analysis showed that radial strain, radial strain rate, circumferential strain, radial velocity and radial displacement are most accurate parameters to assess MST in patients with MI.
- 2) Study demonstrated excellent feasibility to determine MST using CMR-FT.

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## IN-HOSPITAL OUTCOMES AFTER PRIMARY PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY IN OCTOGENARIANS VERSUS YOUNGER PATIENTS

*Artūras Kadys, Andrius Romeika, Kasparas Sinkevičius*

*Supervisor of the abstract: Ramūnas Unikas*

*Interventional cardiology department of Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Lithuania*

## Introduction

The elderly are a growing population with a high prevalence of ischaemic heart disease, especially with ST-elevation myocardial infarction (STEMI). Elderly have worse outcomes after primary percutaneous transluminal coronary

angioplasty (PTCA), despite this fact, international guidelines for the management of STEMI recommended primary percutaneous coronary intervention as the preferred reperfusion strategy, also in elderly patients.

### **Aim**

To evaluate in-hospital results after primary percutaneous coronary angioplasty among different age patients.

### **Objectives**

- 1) To compare different age patients' risk factors, Killip class, door-to-balloon-time and symptom-to-balloon-time.
- 2) To compare coronary angiography and angioplasty data among two age groups.
- 3) To evaluate in-hospital complications and hospital stay duration in different patients' age groups.

### **Methods**

A retrospective analysis of 136 patients with STEMI who had primary PTCA at Interventional cardiology department of Hospital of Lithuanian University of Health Sciences Kaunas Clinics in 2014. Patients were divided into two groups according to their age: group 1 – all patients who already were 80 years old or more (mean age  $83,3 \pm 0,4$  years), group 2 (randomly elected patients) – patients who were less than 80 years old (mean age  $63,6 \pm 1,4$  years). Statistical analysis performed using IBM SPSS Statistics 20. Data compared using Student's t-test, Chi-Square and Mann-Whitney U test. Differences were considered as statistically significant when  $p < 0,05$ .

### **Results**

Patients in group 1 had a higher incidence of hypertension (95,3% vs. 83,1%;  $p < 0,05$ ). Patients in group 2 had a higher incidence of active smoking (5,8% vs. 43,8%;  $p < 0,05$ ) and dyslipidemia (60,9% vs. 83,1%;  $p < 0,05$ ). There were no differences between other risk factors (diabetes mellitus, positive family history of coronary artery disease, obesity, old myocardial infarction;  $p > 0,05$ ) among groups. Door-to-balloon time had no significant difference between groups ( $70,6 \pm 5,3$  vs.  $61,5 \pm 6,2$  minutes;  $p > 0,05$ ) as well as symptom-to-balloon-time ( $8,2 \pm 1,1$  vs.  $5,8 \pm 0,7$  hours;  $p = 0,079$ ). Killip class was significantly higher in group 1 ( $2,36 \pm 0,11$  vs.  $2,06 \pm 0,10$ ;  $p < 0,05$ ). Localization of MI had no significant difference between groups ( $p = 0,085$ ): inferior MI (50,0% vs. 49,2%), anterior MI (50,0% vs. 43,1%), posterior MI (0,0% vs. 7,7%). Amount of damaged coronary arteries, rate of circulation type, culprit artery and fully-occluded artery rates were not significantly different between groups ( $p > 0,05$ ). There were significantly more younger patients with TIMI flow grade 3 after intervention (81,6% vs. 96,3%;  $p < 0,05$ ). Transradial/transfemoral approach rate, procedure duration, X-ray exposure duration, contrast agent amount and Hospital stay duration were not significantly different between groups ( $p > 0,05$ ). In-hospital mortality rate was significantly higher in group 1 (21,0% vs. 4,5%;  $p < 0,05$ ), other complications frequencies (renal insufficiency, arrhythmias, new revascularization requirement, stent thrombosis, haemorrhage at catheter input place) were not significantly different between groups ( $p > 0,05$ ).

### **Conclusions**

- 1) Risk factors did not dominate in one group, door-to-balloon-time was not different among groups, symptom-to-balloon-time was slightly higher and Killip class was significantly higher in elderly group.
- 2) Amount of damaged coronary arteries, rate of circulation type, culprit artery and fully-occluded artery rates, transradial/transfemoral approach rate, procedure duration, X-ray exposure duration and contrast agent amount before intervention were not significantly different among groups, TIMI flow after revascularization was significantly worse in elderly group.
- 3) In-hospital mortality rate was significantly higher in elderly group, other complications did not significantly differ among groups.

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## LEFT ATRIUM FUNCTION EVALUATION BY SPECKLE TRACKING ECHOCARDIOGRAPHY AFTER PACEMAKER PROGRAMMING BASED ON AORTIC TRACT FLOW

*Arnas Karužas, Martynas Žemaitis*

*Supervisor of the abstract: Kristina Baronaitė-Dūdonienė*

*Lithuanian University of Health Sciences, department of Cardiology, Lithuania*

### Introduction

Long term cardiac pacing is related to deterioration of left ventricular and atrial function and bad outcomes in patients with normal AV delay based stimulation [1-2]. In order to improve possible outcomes and patients overall condition stimulation parameters (particular AV delay) can be adjusted individually [2-3] which can be chosen based on aortic tract flow. The effects these changes have to myocardial mechanical function can be assessed using speckle tracking echocardiography (STE) [4-5].

### Aim

To evaluate left atrium function changes with STE after modification of pacemaker (ECS) PR interval based on aortic tract flow.

### Objectives

1. To assess the baseline parameters of left atrium function before implantation of ECS using STE.
2. To evaluate the changes of left atrium function after modification of ECS parameters in 6 months.

### Methods

This was a prospective study in which total of 74 patients were assessed. The research consisted of three groups: a control group of 25 healthy subjects (age mean  $63,9 \pm 7,42$ ) to obtain baseline parameters (Group 1), second group of 25 patients (age mean  $70,4 \pm 9,69$ ) with pacemakers programmed using standart pacing parameters (Group 2), and third group of 24 (age mean  $71,7 \pm 8,08$ ) patients with ECS PR interval chosen based on individual aortic tract flow (Group 3). The pacing mode in Group 2 and 3 was DDDR. Echocardiography was performed before implantation of ECS and 6 months after. Conventional and STE left atrium longitudinal strain rate parameters were obtained. Statistical analysis performed using IBM SPSS Statistics 22 software package. The Kruskal-Wallis non-parametric analysis of variance and Student's T-test were used to compare means. Data presented in mean  $\pm$  SD format. Differences were considered statistically significant when p value was less than 0,05.

### Results

At baseline, all subjects had relaxation type diastolic dysfunction, good LV ejection fraction and did not differ based on age ( $p > 0,05$ ). LA volume was significantly greater in Groups 2 and 3 compared to Group 1 (Group 2:  $56,8 \text{ ml} \pm 14,53$ , Group 3:  $49,48 \text{ ml} \pm 12,78$ , Group 1:  $40,8 \text{ ml} \pm 9,9$ , in all  $p < 0,001$ ). There were no difference between Groups 2 and 3 in LA volumes ( $p = 0,068$ ). During follow up, Group 2 and 3 LA volume significantly increased ( $55,18 \text{ ml} \pm 12,7$  and  $65,66 \text{ ml} \pm 16,3$ ,  $p = 0,003$ ,  $49,47 \text{ ml} \pm 12,7$  and  $56,97 \text{ ml} \pm 16,3$ ,  $p = 0,009$  respectively). LA function was evaluated by measuring strain rate peaks S, E, A (S - LA diastolic function, E - LA function as conduit, A - LA systolic function). At baseline, Group 1, 2 and 3 peaks S and E did not differ significantly ( $p > 0,05$ ). Peak A was

significant lower in Group 2 ( $1,87 \text{ 1/s} \pm 0,57$ ) and Group 3 ( $2,00 \text{ 1/s} \pm 0,82$ ) compared to Group 1 ( $2,97 \text{ 1/s} \pm 0,79$ , in all  $p < 0,001$ ). There were no significant difference between Group 2 and 3 ( $p > 0,05$ ).

At 6 months, peak S and E decreased significantly in Group 2 (S -  $2,05 \text{ 1/s} \pm 0,42$  and  $1,77 \text{ 1/s} \pm 0,59$ ,  $p = 0,022$ , E -  $2,02 \text{ 1/s} \pm 0,51$  and  $1,67 \text{ 1/s} \pm 0,39$ ,  $p = 0,029$ ) while peak A increased ( $1,83 \text{ 1/s} \pm 0,11$  and  $2,18 \text{ 1/s} \pm 0,76$ ,  $p = 0,001$ ). At follow up, peak S and E showed the same tendency in Group 3 (S -  $2,11 \text{ 1/s} \pm 0,52$  and  $1,79 \text{ 1/s} \pm 0,87$ ,  $p = 0,029$ ; E -  $1,98 \text{ 1/s} \pm 0,64$  and  $1,48 \text{ 1/s} \pm 0,67$ ,  $p = 0,005$ ), while peak A had no significant difference ( $2,00 \text{ 1/s} \pm 0,82$  and  $2,19 \text{ 1/s} \pm 1,08$ ,  $p = 0,290$ ).

### Conclusions

In the setting of long-term DDDR pacing an increase in left atrium volume was found in both groups, though systolic strain rate remained unchanged when ECS PR interval was chosen based on the aortic tract flow.

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## MODERATE ISCHAEMIC MITRAL REGURGITATION: CORRELATIONS BETWEEN THE GRADE OF MITRAL REGURGITATION FOLLOWING CORONARY ARTERY BYPASS GRAFTING AND PREOPERATIVE SEVERITY OF LEFT VENTRICLE DYSFUNCTION

*Goda Maciulevičiūtė, Dovilė Rimkevičiūtė*

*Supervisor of the abstract: Jolanta Vaškelytė*

*Department of Cardiology, Medical Academy, Lithuanian university of health sciences, Lithuania*

### Introduction

Ischaemic mitral regurgitation (IMR) remains one of the most complex and unresolved aspects in treatment of ischaemic heart disease. There is general agreement that patients with severe IMR should undergo mitral valve surgery at the time of coronary artery bypass grafting (CABG). However, the management of moderate IMR in such patients is still controversial.

### Aim

To determine the course of uncorrected moderate ischaemic mitral regurgitation after coronary artery bypass grafting and evaluate preoperative factors which contribute to the deterioration of MR.

### Objectives

1. To evaluate the course of moderate IMR after CABG without MR correction.

2. To evaluate the course of moderate IMR after CABG without MR correction depending on severity of preoperative systolic dysfunction.
3. To evaluate the influence of MR progression on left ventricle (LV) functional and morphometric parameters.
4. To reveal preoperative factors that contribute to deterioration of uncorrected MR after CABG.

## Methods

The study population consisted of 136 patients with ischaemic heart disease and ischaemic moderate IMR (MR grade 2, evaluated by qualitative and quantitative echocardiographic methods). Patients with rheumatic, myxomatous, infectious or congenital diseases of MV as well as MR due to papillary muscle or chordae tendineae rupture were not included. All patients underwent CABG without mitral regurgitation correction at Hospital of Lithuanian University of Health Sciences Kaunas Clinics from 2006 to 2012 years. Study protocol included evaluation of two-dimensional Doppler echocardiographic preoperative and late postoperative examinations. Functional and morphometric parameters were analyzed: left ventricular end-diastolic diameter (LVEDD), LV end-diastolic diameter index (LVEDDi), myocardium mass index (MI), left ventricular ejection fraction (LVEF), wall motion score (WMS) index, left atrium (LA) diameter, mean pulmonary artery pressure. Patients were divided into two groups depending on preoperative LVEF: group 1 – EF ≤ 35% (n = 34), group 2 – EF >35% (n = 102). Furthermore some clinical findings were included: age, hypertension, diabetes, functional status according to New York Heart Association. All data were expressed as mean ± standard deviation. To compare preoperative and postoperative results, as well as data among the groups, t-test,  $\chi^2$  and Wilcoxon's tests were used. LVEDD, LVEF, myocardium MI, LA diameter, WMS index were included into multiple regression analysis to determine the independent predictors of uncorrected MR progression after CABG. A p-value of

## Results

Mean age of patients – 66,63 ± 10,14 years. Mean duration of observation – 3,78 ± 0,27 years, at least 2 years. Assessing the course of uncorrected MR after CABG, MR grade increased in 30 (22%) patients, remained the same in 75 (55%) patients and MR reduced in 31 (23%) patients. In group 1 MR grade increased in 13 (38,2%) patients, did not change in 17 (50%) and decreased in 4 (11,8%) patients. In group 2 MR grade increased in 17 (16,7%) patients, did not change in 58 (56,9%) and MR reduced in 27 (26,4%) patients. Taking into account only patients of this group with preserved systolic function (LVEF ≥ 50%, n = 34), similar tendency was noticed: MR grade increased in 5 (14,7%) patients, did not change in 21 (61,7%) and MR reduced in 8 (23,6%) patients. In group 1, for those, whose MR grade increased, LVEDD after CABG increased by 2,5 mm from 56,1 ± 1,5 mm to 58,6 ± 2,1 mm (p = 0,043) and LA diameter increased by 5,4 mm from 43,1 ± 1,3 mm to 48,5 ± 1,1 mm (p = 0,001). In the same group, for those, whose MR grade did not increase, the growth of LA diameter by 3,8 mm was observed – from 44 ± 1,5 mm to 47,8 ± 1,5 (p = 0,013). In group 2, for those, whose MR grade increased, LA diameter increased by 3 mm from 43,4 ± 1,1 mm to 46,4 ± 1,6 mm (p = 0,022). For those, whose MR grade did not increase, there was change in LA diameter by 2,4 mm from 42,3 ± 0,7 to 44,7 ± 0,9 mm (p = 0,013). No other changes in functional or morphometric parameters were revealed (p > 0,05). Comparing preoperative echocardiographic data of patients, whose MR grade increased, with these, whose MR grade decreased, statistically significant differences were revealed: LVEDD (52,2 ± 1,1 mm vs 48,5 ± 1,1 mm, p = 0,02), myocardium MI (121,2 ± 4,9 g/m<sup>2</sup> vs 110,9 ± 4,8 g/m<sup>2</sup>, p = 0,41), LA diameter (43,3 ± 0,8 mm vs 39,7 ± 1 mm, p = 0,009), WMS (1,73 ± 0,08 vs 1,51 ± 0,06, p = 0,047), LVEF (37,6 ± 2,3% vs 41,8 ± 0,9%, p = 0,05) and there was no significant difference in mean pulmonary artery pressure. Comparing preoperative clinical data (age, hypertension, diabetes, functional status according to New York Heart Association, atrial fibrillation), no significant difference between these groups was observed. Multivariate regression analysis identified LVEF as independent predictor of MR grade increase after CABG without MR correction (O.R. 0,96, 95% C.I. 0,922-0,998, p = 0,042). Impaired EF increased the probability of MR to deteriorate.

## Conclusions

1. Uncorrected moderate ischaemic mitral regurgitation grade after CABG increased in one fifth of patients.
2. Among patients with more severe systolic dysfunction MR grade increased twice as often as among those with better systolic LV function.
3. Uncorrected MR grade increase, following CABG, when preoperative systolic dysfunction was more significant, was

associated with LV and LA enlargement and that can lead to further MR deterioration.

4. Multivariate analysis showed that LVEF was an independent predictor of MR grade increase after CABG without MR correction.

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## NON-INVASIVE STRESS TESTING VS. INVASIVE CORONARY ANGIOGRAPHY USE FOR STABLE ANGINA DIAGNOSIS AND TREATMENT SELECTION

*Justinas Bacevičius*

*Supervisor of the abstract: Egidijus Berūkštis, Jelena Čelutkienė*

*Vilnius University, Faculty of Medicine, Lithuania*

### Introduction

Non-invasive stress testing before invasive coronary angiography (ICA) in patients with stable coronary artery disease (SCAD) is recommended for pre-test-probability (PTP)  $\leq 85\%$  group<sup>[1][2]</sup>. However, numerous experienced medical centers follow the previous recommendation only partly.

### Aim

To investigate non-invasive stress testing rate, diagnostic value and influence for treatment choice compared to ICA in patients with SCAD.

### Objectives

1) To determine how many stable angina ICA-examined-patients had non-invasive stress testing. 2) To determine how many of only ICA-examined-patients were  $\leq 69$  years old (which is always referred as PTP  $\leq 85\%$  group and is recommended to be performed with non-invasive testing prior to ICA). 3) To investigate link between significant stenosis visualized in ICA vs. dobutamine stress echocardiography (DSE), stress myocardial perfusion SPECT and stress electrocardiography (VEM). 4) To investigate link between treatment choice vs. DSE, SPECT, VEM and ICA results.

### Methods

A retrospective study was performed in Vilnius University Hospital Santariškių Klinikos including 2183 angina pectoris patients with ICA performed 2013-2014. Final analysis includes 1176 patients. Criteria: diagnosed stable angina and ICA performed. Non-invasive stress testing evaluated by "positive/negative". Criteria for positive stress test:  $\geq 1$ mm ST depression in 2 derivations (VEM),  $\geq 3/16$  segments movement disorders (DSE), defect of  $\geq 10\%$  of myocardium and/ or difference between summed stress and resting scores  $\geq 5\%$  (SPECT). Significant stenosis by ICA considered as RCA/LAD/LCX  $\geq 70\%$  or LMCA  $\geq 50\%$  <sup>[3]</sup>. Treatment choices: percutaneous coronary intervention (PCI), aortocoronary bypass graft surgery (CABG) or only medicament treatment (MT). Statistical methods: Student's T test, Analysis of variance (ANOVA), Chi square, Fisher's exact test.

### Results

1) 51,8% (n = 609) of ICA-examined-patients had non-invasive stress tests before  $\leq 1$  years vs. 48,2% (n = 567) of

subjects had only ICA performed. Respectively ( $65,5 \pm 9,4$  yrs., males 72,6%) and ( $68,0 \pm 10,0$  yrs., males 64,6%). Structure of non-invasive tests: VEM 82,9% (n = 505) which was not informative 23,0% (n = 116), DSE 24,0% (n = 146) which was not informative 7,5% (n = 11) and stress myocardial perfusion SPECT 7,7% (n = 47).

2) 51,1% (n = 290) of only ICA-examined-patients were  $\leq 69$  years old. Which forms 24,7% of all stable angina patients.

3) By DSE ( $p < 0,001$ ), SPECT ( $p < 0,05$ ) and VEM ( $p < 0,001$ ) patients with absent or a single significant stenosis seen in ICA differs from group with  $\geq 2$  significant stenosis.

4) DSE ( $p < 0,001$ ), SPECT ( $p < 0,001$ ,  $p < 0,001$ ) and VEM ( $p < 0,001$ ) had influence for PCI and CABG choice. The influence for MT choice was not significant ( $p > 0,05$ ). ICA had influence for all treatment choices ( $p < 0,001$ ).

### Conclusions

A significant part of stable angina patients is examined coronarographically without non-invasive testing. If any of dobutamine stress echocardiography, stress myocardial perfusion SPECT or stress electrocardiography test is positive, stenosis of  $\geq 2$  segments of heart coronary arteries is likely. These non-invasive tests have influence for PCI or CABG choice of treatment and no clear influence for optimal medical treatment.

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## PECULIARITIES OF SEVERE DEGENERATIVE AND CONGENITAL BICUSPID AORTIC VALVE AORTIC STENOSIS

*Rita Rimkutė, Saulė Kiaunytė*

*Supervisor of the abstract: Regina Jonkaitienė*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Degenerative aortic stenosis (DAS) is one of the most common acquired heart valve diseases in elderly people [1]. The AS due to calcinosis of congenital bicuspid aortic valve (BAVAS) is most frequent in younger patients [2]. There are three specific symptoms of AS: angina, dyspnoea and syncope [2]. The symptomatic severe AS is an indication for surgery [3].

### Aim

To determine the peculiarities of clinical manifestation, coronary artery disease (CAD) and aortopathy as well as timing of surgery in patients with severe DAS and BAVAS who were treated in LSMU hospital Kaunas Clinics (HKC) in the Department of Cardiology during 2009 – 2014 years.

### Objectives

1. To compare age and gender differences in patients with severe DAS and BAVAS.
2. To analyse the peculiarities of DAS and BAVAS, regarding the:
  - 1) clinical manifestation;
  - 2) CAD and aortopathy.
3. To identify reasons in chosen elective (EO) and urgent (UO) operation in DAS and BAVAS.
4. To compare selected surgical methods and types of AV prostheses.

### Methods

The retrospective analysis of case histories of patients with severe DAS and BAVAS was performed, regarding patients

who were hospitalized during 2009-2014 years (yr.) in LSMU HKC Department of Cardiology and referred for surgery. The following data were analysed: clinical symptoms (angina, dyspnoea, syncope), data from the protocols of 2D-echocardiography. AS was determined as severe when AV area was  $\leq 1\text{cm}^2$ . According to the coronary artery angiography (CAA) data, severe CAD was diagnosed when CA stenosis was  $>70$  pct. and non-significant CAD (nsCAD), when  $< 50$  pct. The time and methods of surgery (isolated AV prosthesis implantation (iAVP), complex operation (bypass grafting and AVP) (CxO), Bentall operation (BO) and types of AVP (biological AVP (BAVP), mechanical AVP (MAVP) were analysed according to the operation protocols. The statistical analysis was performed using a standard statistical package SPSS 17.0 and Microsoft Excel 2013. The selected statistical level of trust was  $p < 0,05$ .

## Results

The 466 patients were referred for surgery: 230 women (49,4 pct.) and 236 men (50,6 pct.). There were 355 patients with DAS: 191 women (53,8 pct.) and 164 men (46,2 pct.) and 111 patients with BAVAS: 39 women (35,1 pct.) and 72 men (64,9 pct.) ( $p < 0,001$ ).

Angina was in 83,8 pct. of DAS and in 77,8 pct. of BAVAS patients. Dyspnoea was in 91 pct. of DAS and 92,6 pct. of BAVAS. Syncope was in 30,6 pct. of DAS and 22,2 pct. of BAVAS ( $p > 0,05$ ).

Severe CAD was found in 46,1 pct. of DAS and 32,4 pct. of BAVAS patients. nsCAD was found in 14 pct. of DAS and 13,5 pct. of BAVAS. 39,9 pct. of DAS and 54,1 pct. of BAVAS patients were without CAD ( $p < 0,001$ ).

UO was chosen in 21,4 pct. of DAS and 19,8 pct. of BAVAS patients. Despite etiology, UO was chosen more often with increasing number of symptoms ( $p < 0,001$ ).

In DAS and severe CAD UO was chosen more often than in BAVAS ( $p < 0,05$ ).

IAVP was done for 49,9 pct. of DAS and for 20,4 pct. of BAVAS patients. CxO was performed in 46,2 pct. of DAS and in 8,2 pct. of BAVAS patients. BO was done for 4 pct. of DAS and 67,3 pct. of BAVAS patients ( $p < 0,001$ ).

## Conclusions

1. BAVAS was diagnosed more often in younger men, DAS - in elderly women.
2. Despite etiology severe aortic stenosis usually manifested with two symptoms: angina and dyspnoea. Severe CAD was found more often in DAS patients. In more than half of BAVAS patients CAD was not detected. The aortopathy was more common in patients with BAVAS.
3. Despite etiology urgent operation was selected more often with increasing number of symptoms and more often in DAS patients with severe CAD and BAVAS patients with aortopathy.
4. Isolated AVP implantation and complex operation was done more often for DAS patients. Bentall operation was done more often for BAVAS patients. Biological AVP was implanted for the majority of DAS patients and mechanical AVP - for BAVAS patients.

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# RELATION BETWEEN CHANGES OF MORPHOLOGICAL PULMONARY VEINS PARAMETERS IN PATIENTS WITH ISCHEMIC HEART DISEASE, ARTERIAL HYPERTENSION AND ATRIAL FIBRILLATION

*Marija Kinderytė, Simona Sabulytė, Grytė Širvaitytė*

*Supervisor of the abstract: Vytautas Zabiela, Antanas Jankauskas*

*Cardiology department, LSMU, Lithuania*

## Introduction

The aim of this study was to investigate the factors which could have an impact on changes of morphological parameters pulmonary veins (PV). We predict that these changes could cause an increased risk of atrial fibrillation (AF) development. The relationship between anatomical findings of PV and certain clinical conditions have been not studied in our previous research. In this study we decided to investigate the relationship between PV anatomy and examination findings of ischemic heart disease (IHD) and arterial hypertension (AH).

## Aim

To analyze the relationship between morphometrical parameters of pulmonary veins and ischemic heart disease, arterial hypertension and atrial fibrillation.

## Objectives

1. To compare pulmonary veins morphological parameters between patients with and without ischemic heart disease.
2. To compare pulmonary veins morphological parameters between patients with and without arterial hypertension.
3. To compare pulmonary veins morphological parameters between patients with and free from atrial fibrillation.
4. To evaluate the impact of ischemic heart disease and arterial hypertension to atrial fibrillation development.

## Methods

We measured morphological PV parameters and obtained data of IHD, AH and AF from medical documentary of patients who visited Cardiology department in hospital of Lithuanian University of Health Sciences Kaunas Clinics (LSMU KC).

Multi – detector row CT (Aquilion; Toshiba Medical Systems, Otawara, Japan) was performed for subjects at Department of Radiology in LSMU KC in 2013. The CT examinations were reviewed retrospectively to 108 patients by three medical students non – radiologists. PV anatomy was assessed by using Jivex programme. There were observed these anatomical variations of PV:

1. four PV – left superior PV (LSPV), left inferior PV (LIPV), right superior PV (RSPV), right inferior PV (RIPV),
2. one additional right PV to the four main PV (ARPV – 1),
3. two additional right PV to the four main PV (ARPV – 2),
4. left common trunk (LCT),
5. LCT and ARPV.

PV ostia measurements (morphological parameters of PV) were performed by using Syngovia programme. Anterior – posterior (AP) direction and superior – inferior (SI) direction diameters of PV ostium were measured and the ovality index (OI) of PV ostium was calculated dividing AP by SI (AP/SI). PV ostia perimeter was calculated by the following formula:

Patients were divided into following groups according certain clinical conditions:

1. Patients with IHD were considered those who had confirmed hemodynamically significant coronary arteries stenosis (>50 percent) during coronary computed tomography angiography (CCTA) and without IHD - coronary arteries stenosis (<50 percent) or stenosis had not been confirmed by CCTA.
2. Patients with arterial hypertension were considered those who had >140 mmHg systolic and >90 mmHg diastolic blood pressure and left ventricular (LV) hypertrophy confirmed by 2-D echocardiography. LV

hypertrophy was divided into following groups: concentric hypertrophy, eccentric hypertrophy, remodelling LV geometry.

3. Patients with AF were considered those whose diagnosis were confirmed in patient's medical documentary. They were divided into following groups: patients with AF (paroxysmal AF, permanent AF, persistent AF) and free from AF.

Statistical analysis were calculated with IBM SPSS Statistics 20 software. Means were calculated. Data analysis was performed using Independent Samples Kruskal – Wallis Test, Independent Samples Student's' t Test, Chi – square Test. The results were evaluated within the  $P < 0.05$  confidence level.

## Results

In final sample size we included 81 subjects because 27 patients were excluded for missing data (listed hierarchically: 20 missing 2-D echocardiographic parameters, 7 missing medical documentary).

39 (48, 1 percent) patients had ARPV1. Ischemic heart disease was found in 24 (29,6 percent) patients. 11 (45,8 percent) of these patients had ARPV1. More over the ovality index of ARPV1 in patients with IHD was significantly larger (veins are more oval) (OI mean 1,3) compare to patients without IHD.

LV hypertrophy was diagnosed by 2-D echocardiography to 63 (77,8 percent) patients. We found relationship between ARPV1, LIPV perimeters and LV hypertrophy. Perimeter of ARPV1 was greater (2,32 mm), but perimeter of LIPV – smaller (4,02 mm) in patients who had LV hypertrophy compare to patients with normal LV geometry.

When LV hypertrophy was divided into smaller groups by hypertrophy type, we found that LIPV perimeter was significantly smaller in patients with concentric hypertrophy compare to patients with eccentric hypertrophy, remodelling and normal LV geometry.

18 (22,2 percent) patients had diagnosis of AF. Perimeter of LSPV was significantly greater in patients with AF (4,44 mm). 6 patients had one atypical PV anatomy variant – LCT . Patients with atypical PV anatomy variant (LCT) did not have AF ( $p = 0,001$ ).

LV hypertrophy and AF together were found in 12 (14,8 percent). IHD and AF together were found in 6 (7,4 percent). We did not found any relation between LV hypertrophy, IHD and AF development. It might be caused by small final sample size of patients with AF.

## Conclusions

1. The ovality index of ARPV1 in patients with IHD are larger (veins are more oval).
2. Perimeter of ARPV1 is greater and perimeter of LIPV – smaller in patients with LV hypertrophy compare to patients with normal LV geometry. Patients with concentric hypertrophy have greater perimeter of LIPV. The morphological PV parameters do not change in the early stages of LV hypertrophy. It is important to diagnose remodelling of LV to prevent morphological changes of PV.
3. Perimeter of LSPV was greater in patients with AF.
4. We did not found any relation between LV hypertrophy, IHD and AF development.

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## THE EFFECTS OF APPLYING EXPRESSIVE WRITING THERAPY FOR PATIENTS WITH ISCHAEMIC HEART DISEASE

*Valdonė Kolaitytė, Arvilė Gadeikytė, Robertas Pranevičius*

*Supervisor of the abstract: Joana Kriščiokaitytė, Raimondas Savickas*

*Department of Rehabilitation, LSMU, Lithuania*

## Introduction

The ability to understand and control chronic condition and its outcomes leads to better health indicators for patients with life-long conditions [1]. Numerous research data suggests that patients with controlled arterial hypertension (AH) have better health-related quality-of-life (QOL) compared to the patient group with the poorly controlled AH [2]. In spite of importance of social and psychological health in life quality, chronically ill patients with poor self-perceived health experience poorer quality of life and deem their condition as a traumatic event [2,3]. These findings indicate that the inadequate self-assessment of health may have negative effects on both social and physical health [4]. Thus managing patient's psychological responses to their condition and treatment possibilities is the core objective of healthcare specialists and doctors in rehabilitation hospitals. Patient hospitalization length in rehabilitation hospitals is relatively short which means that the correction of emotional impairment requires effective short-term group psychotherapy [5,6]. One of the intervention methods, having positive effect on self-evaluation of health and mental condition, is expressive writing therapy [6]. Writing, as an expression of emotions, improves physical health and also has positive outcomes on subjective well-being indicators (psychological health, subjective health self-assessment) and general psychological adjustment [6,7]. Expressive writing as a method is a spontaneous emotion expression by writing about various inner emotional traumatic past events that may be helpful for the patient cognitive and emotional processing of the condition [7]. The goal of this method is the use of writing instead of verbal expression to achieve paramount expression of feelings that leads to ease of the emotional trauma, organization of thoughts and QOL improvement [8].

## Aim

Identify the changes in emotional state and arterial blood pressure of patient group with ischemic heart disease when expressive writing therapy intervention is applied throughout rehabilitative period.

## Objectives

1. Evaluate and compare the difference in change of the arterial blood pressure in patient groups where neutral writing, expressive writing and no writing therapy were applied.
2. Assess the changes in emotional condition throughout the application of therapy in neutral, expressive and no-writing therapy groups.

## Methods

The study was carried out in rehabilitation hospitals in the city of Druskininkai during the period of 2012 October - 2014 November. The patients of the rehabilitation hospital were invited to participate in the study by the treating doctor upon personal invitation or by registration for psychotherapy. The final study group consists of 412 patients with ischemic heart disease who were treated in the department of cardiology. The patients included in the study have been diagnosed with the ischemic heart disease treated for it within the period of 5 or less years. The patients without any previous psychotherapeutic interventions included in the expressive writing study group, whereas patients with previous interventions such as music therapy, video relaxation, relaxation with aromatherapy, etc. were excluded from the study. The arterial blood pressure management was performed before and after therapeutic intervention. The evaluation of arterial blood pressure was performed according to the requirements of the WHO, and the emotional state change evaluation was assessed by using a questionnaire PANAS-X. Statistical analyses were performed using SPSS ver.19 software. For qualitative data analysis we used Chi-square parameter and for quantitative - Student parameter. Nonparametric Mann-Whitney parameter was used to compare the data. Along with that we performed logistic regression analysis to identify independent factors leading to a different outcome. For verification of statistical hypotheses, the significance level of ( $p < 0.05$ ) was chosen.

## Results

Negative emotions, analyzed separately and compared between the groups, show statistically significant difference in negative emotion decrease (fear, hostility, guilt, sadness) in expressive writing patient group. ( $p < 0,001$ )

What is more, a relatively strong positive correlation between negative emotions and diastolic blood pressure changes has been identified ( $p < 0,001$ ). In this case positive correlation is suggestive of interdependent increase of diastolic blood pressure and negative emotions.

It has been identified that intervention leads to statistically significantly lower systolic blood pressure in both neutral and expressive writing groups (mean  $\pm$  SD  $137.01 \pm 23.97 / 126.02 \pm 14.22$ ). Moreover, expressive writing group also showed a significant decrease in diastolic blood pressure ( $81.04 \pm 11.97 / 77.23 \pm 11.41$ ).

The arterial blood pressure changes in control group and diastolic blood pressure difference in neutral writing group were statistically irrelevant.

Arterial blood pressure (ABP) analysis in expressive writing group displays a steady predicted change – during the initial EW therapy ABP increased whereas continuous and final sessions revealed decreased ABP. On the other hand, there was no consistency in ABP difference in no writing group.

Analysis of arterial blood pressure variations in groups showed that EW group's arterial blood pressure significantly decreased. When analyzing systolic arterial blood pressure of neutral writing group – it showed a significant decrease ( $p < 0.001$ ) and diastolic arterial blood pressure remained unchanged.

Data revealed that arterial blood pressure changes of EW group is significantly lower after intervention ( $p < 0.001$ ) than blood pressure changes of neutral writing group.

The study results indicate that EW method can be effective method of managing arterial blood pressure and emotional state for the patients in rehabilitation hospitals. Even minimally decreased arterial blood pressure reduces the risk of cardiovascular complications such as myocardial infarction and stroke for patients with hypertension. This proves that EW therapy can potentially be crucial intervention as it has significant effects on patient's ABP. By applying this method into practice it is possible to assist the patients in managing their emotional reactions to the disease and ensure the development of realistic self-perceived physical condition.

## Conclusions

1. Analysis of the effects of different therapy in the population of patients with ischaemic heart disease showed statistically relevant contrast in Arterial blood pressure change (ABP). The arterial blood pressure changes in control group and diastolic blood pressure difference in neutral writing group were statistically irrelevant. Analysis of arterial blood pressure variations in groups showed that EW group's arterial blood pressure significantly decreased. Patient group, where expressive writing (EW) therapy was applied showed significantly decreased arterial blood pressure (ABP) when compared to no writing group ABP changes.
2. Expressive writing group changes of positive and negative affect are significantly bigger than neutral writing group affect changes. Negative emotions, analyzed separately and compared between the groups, show statistically significant difference in negative emotion decrease (fear, hostility, guilt, sadness) in expressive writing patient group.

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## **THE EVALUATION OF CLINICAL SIGNS, LABORATORY TEST RESULTS ACCORDING TO AGE, GENDER AND TIME FROM APPEARED PAIN TO INTERVENTION PROCEDURE IN PATIENTS WICH SUFFERED ACUTE MYOCARDIAL INFARCTION (AMI) AND DYED DURING 2014.**

*Robertas Pranevičius, Vidmantė Jašiškytė*

*Supervisor of the abstract: Lina Bardauskienė, Olivija Gustienė  
Cardiology, Lithuanian University of Health Sciences, Lithuania*

### **Introduction**

Acute ischemia is often responsible for sudden or delay death. For that reason it is very important to analyze clinical signs, laboratory test results, hospitalization time and compare it in different sex and age. In the longer term, studies suggest that mortality risk for women is lower or similar to that of men. However, length of follow up and adjustment for confounding factors have varied. In this study we tried to examine overall differences and temporal trends therein between men and women, also in different age regarding the incidence rates in-hospital clinical signs, laboratory test results, after initial acute myocardial infarction (AMI) of dead patients.

### **Aim**

Is to evaluate the clinical signs, laboratory test results according to age, gender and time from appeared pain to intervention procedure in patients wich suffered acute myocardial infarction (AMI) and dyed during 2014.

### **Objectives**

1. To assess the clinical signs, laboratory test results according to the study participants age.
2. To assess the clinical signs, laboratory test results according to the study participants gender.
3. To assess the clinical signs, laboratory test results according to the study participants time when they felt pain until the intervention procedure was done.

### **Methods**

387 patients case records were analyzed by a retrospective analysis according to patients clinical signs, laboratory tests results, gender, age and time when they felt pain until the intervention procedure was done. Data has been analyzed SPSS V22.0 version using  $\chi^2$  criteria and statistically significant difference was held when  $p < 0,05$ .

### **Results**

1. The average age of the hospitalized patients were 79.5yrs. 66.7% less than 60 yrs, 96% (60 – 80yrs) and 93.3% older than 80 yrs patients with AMI experienced the typical pain. 100% of less than 60 yrs. patients had anterior MI. (60 - 80 yrs) 60% of patients – had anterior, 32% of patients – posterior MI, 4% of the lateral - posterior MI. Older than 80 years patients data was : 63.3% had anterior MI, 33.3% - posterior, 3.3% - lateral - posterior. Ventricular fibrillation (VF) occurred in 33.3% (<60 yrs), 24% (60 - 80 yrs), 6.7% (>80 yrs). Atrial fibrillation (AF) 32% (60 - 80 yrs), 43.3% (>80 yrs). Atrioventricular block (AVB) 20% (60 - 80 yrs), 23.3% (> 80 yrs). Asystole 100% (<60 yrs), 100% (60 - 80 yrs), 86.7% (> 80 yrs). 1 vessel disease (VD) 66.7% (<60 yrs), 40% (60 - 80 yrs), 23.3% (> 80 yrs). 2VD occurred 24% (60 - 80 yrs), 20% (> 80 yrs). 3VD 40% (60 - 80 yrs), 56.6% (>80 yrs). 66.7% increase in leukocyte (<60 yrs), 72% (60 - 80 yrs), 70% (> 80 yrs). Troponin I (1 - 100µg / l) - 66.7% (<60 yrs), 68% (60 -80 yrs) 63.3% (> 80 yrs), (101 - 200mg / l) - 4% (60 - 80 yrs),

6.7% (>80 yrs), (201 - 300µg / l) - 3.3% (> 80 yrs). Hemoglobin distribution (60 - 100 g / l) - 16% (60 - 80 yrs), 6.7% (> 80 yrs), (101 - 120 g / l) - 24% (60 - 80 yrs), 40% (> 80 yrs), (121 - 179g / l) - 100% (<60 yrs), 60% (60 - 80 yrs), 53.3% (> 80 yrs). 2. Typical pain occurred in 96.6% of women and 89.7% men. 65.5% of women reported anterior MI, 31% - lower, 3.5% - posterior MI. 62.1% of men anterior, 31% - posterior, 6.9% - lateral - posterior. VF 10.4% of women and 20.7% of men. AF 37.9% women, 34.5% of men. 1VD damaged 37.9% of women and 27.6% men. 2VD 27.6% of women and 13.8% of men. 3VD disease 31% of women and 62.1% of men. AVB 20.7% of women and 20.7% of men. Asystole 96.6% women, 89.7% of men. White blood cells increased by 72.4% of women and 69% of men. Troponin I (1 - 100µg / l) - 62.1% (women), 69% (men.), (101 - 200mg / l) - 6.9% (women), 3.5% (men) Hemoglobin in the gender distribution (60 - 100 g / l) - 17.2% (women), 3.5% 1 (men). (101 - 120 g / l) - 31% (women), 31% (men) (121 - 179g / l) - 51.7% (women), 65.5% (men). 3. The time from the beginning of the pain and the procedure admission, a typical pain occurred in 91.7%, arrived 2 - 8 hours., 100% of patients arrived within 9-16 hrs., 90% of patients who arrived 17 - 128h. Arrived within 2-8 hours 66.7% - anterior MI, 30.6% - lower, 2.8% posterior MI. Upon arrival in 9 - 16 hours anterior MI - 50% lower - 41.7%, lateral - 8.3%. Upon arrival within 17 - 128val. anterior MI - 70%, lower - 20% lateral - 10%. VF in 25% of that came in 2 - 8 hours. AF occurred in 36.1% arrived within 2 - 8 hours., 33.3% of patients arrived within 9 - 16 hours., As well as 40% on arrival within 17 - 128val. AVB was 16.7% (arrival within 2 - 8 hours.), 33.3% (arrival within 9 - 16 hours.), 20% (arrival within 17 - 128val.). Asystole was 94.4% arrived within 2 - 8 hours. 100% of the patients who came within 9 - 16 hours., 80% of patients on arrival within 17 - 128val. Within 2-8 hours 41.7% of patients arrived - 1VD, 19.4% - 2VD, 41.7% - 3VD. During the 9 - 16 hours 16.7% of the patients who come 1VD damage, 25% - 2VD, 50% - 3VD. Hospitalization over 17 - 128 hours. 20% of patients 1VD damage by 20% - 2VD 40% - 3VD. Leukocytes increased 66.7% arrived within 2 - 8 hours, 75% - over 9 - 16 hours., 80% - over 17 - 128 hours. Hemoglobin (60 - 100 g / l) - 11.1% (2 - 8 hours.) 8.3% (9 - 16 hours), 10% (17 - 128 hours). (101 - 120 g / l) - 27.8% (2 - 8 hours.), 41.7% (9 - 16 hours.), 30% (17 - 128 hours). (121 - 179g / l) - 61.11% (2 - 8 hours.), 50% (9 - 16 hours.), 60% (17 - 128 hours).

## Conclusions

1. A majority of the patients after the typical pain occurred mostly over 80 year old. In all age groups the most common was anterior MI. VF occurred in all age groups, but mainly by 60 and 60 - 80 years groups. AF occurred in 60 - 80 yrs and older than 80 yrs age groups, more in older than 80 yrs group. AVB slightly more experienced older than 80 yrs group than in the 60 - 80 yrs. Asystole occupied all groups. Most people with 1VD violation < 60 yrs, 2VD - 60 - 80 yrs, 3VD - > 80 yrs. Patients mainly had 3 VD. Patients in group of 60-80 year, frequently had higher amount of Leukocytes. Troponin I usually distributed 1 - 100µg / l group. (1 - 100µg / l) - the most common in 60 - 80 yrs group, (101 - 200mg / l), and (201 - 300µg / l) - > 80 yrs. The amount of hemoglobin distributed the most common in 121 - 179g / l group, (60 - 100 g / l) was the most common in 60 - 80 yrs old group, (101 - 120 g / l) - > 80m., (121 - 179g / l) - <60 yrs old groups. 2. Typical pain for female patient was frequent fairly than male. Both genders had common anterior MI. VF was more common for male. AF was more common for female. Female usually had 1VD when men had 3VD. 1VD, 2VD were more common in female group while male had more common a 3VD. AVB occurred equally often in both gender. Asystole was more common for female group. White blood cells increased slightly more often for female. Troponin I usually distributed in 1 - 100µg / l group. (1 - 100µg / l) - slightly more common for male, (101 - 200mg / l) - female more often than male, (201 - 300µg / l) - only for male. Hemoglobin breakdown was observed as most common in 121 - 179g / l group. (60 - 100 g / l) - more women than men (101 - 120 g / l) - levels (121 - 179g / l) - more men than women. 3. Depending on the time from the onset of pain before admission, a typical pain occurred in all groups of the time. Average arrival time from 9-16 hours. Anterior MI dominated in all time groups when VF dominated in 2 - 8 hours, AF - from 17 - 128h, AVB - from 9 - 16h, Asystole - within 9 - 16 h. Patients with high amount of leukocytes usually presented from over 17 - 128h

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## THE EVALUATION OF IN-HOSPITAL RESULTS IN PATIENTS WITH ST-SEGMENT ELEVATION ACUTE MYOCARDIAL INFARCTION AFTER STENTING WITH MESH-COVERED STENTS

*Saulė Kiaunytė, Gintarė Plačinskaitė*

*Supervisor of the abstract: Ramūnas Unikas*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

The only available mesh-covered stent in the market is the MGuard® stent. MGuard® stent is based on a stent which is wrapped with an expandable MicroNet (mesh). The net is made of a single knitted Polyethylene Terephthalate fiber and such stent is dedicated specifically to prevent distal embolization of thrombi or micro-debris during stent implantation procedure. The ability of stent implantation to improve indexes of reperfusion may depend on the time to reperfusion in acute ST-segment elevation myocardial infarction (STEMI). [1,2]

### Aim

To evaluate and analyze in-hospital results, after implantation of mesh-covered stents and compare them to other routine stents in patients with STEMI.

### Objectives

1. To assess the rate of successful procedures when mesh-covered stents are implanted comparing to other routine stents; 2. to evaluate distal embolization rate during the procedure when mesh-covered stents are implanted comparing to other routine stents; 3. to evaluate major adverse cardiovascular events (MACE), worsening of heart failure and stent thrombosis after implanting mesh-covered stents comparing to other routine stents.

### Methods

Retrospective data analysis of patients with acute myocardial infarction presenting with ST-segment elevation was carried out. These patients were treated in the Department of Cardiology, Lithuanian university of health sciences. During this research, 160 medical records were analyzed. Patients were divided into two groups according to the type of implanted stent. MGuard® stent (with mesh) group patients made up 50%, the comparison group also made up 50%. The comparison group was formed using simple random sample when a patient had stent without net implanted. In documents and records it was searched for such data as: distal embolization during the procedure, MACE (death, stroke, target lesion revascularization (TLR)), stent thrombosis and worsening of heart failure). The stent implantation procedure was considered as successful when there was no residual stenosis and TIMI3 (Thrombosis In Myocardial Infarction) grade antegrade blood flow in the infarct – related artery was restored. The worsening of heart failure was qualified as the increase in Killip class during the in-hospital period.

Statistical data analysis was carried out using the standard statistics package SPSS and Microsoft Excel 2010. The chosen level of statistical significance was  $p < 0,05$ .

### Results

1. The rate of successful procedure was 95% in both groups ( $p > 0,05$ ).  
2. When mesh-covered stents were implanted, distal embolization was found in 8,8% cases. When other routine stents were implanted, distal embolization was found in 11,3% cases ( $p = 0,042$ ).

3. During in-hospital period, the stroke was diagnosed in no patients with mesh-covered stent and in 2,5% cases of patients with other routine stents ( $p > 0,05$ ). Death during in-hospital period occurred in 3,8% and 6,3% cases of patients respectively ( $p = 0,001$ ). Definitive stent thrombosis was found in 0,6% in both groups ( $p > 0,05$ ) and these patients required TLR. Worsening of heart failure during in-hospital period was in 13,8% cases of patients (when mesh-covered stent was implanted); in 18,8% cases of patients (when routine stent was implanted) ( $p > 0,05$ ).

### Conclusions

1. The rate of successful procedure was the same in both groups.
2. The rate of distal embolization when mesh-covered stents are implanted is significantly less likely to appear than having other routine stents implanted.
3. Rate of MACE is significantly lower in mesh-covered stent group. Rate of stent thrombosis was the same in both groups. Worsening of heart failure appears with similar prevalence independently on the kind of stent.

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## THE IMPACT OF EVIDENCE-BASED TREATMENT ON CARDIOVASCULAR MORTALITY FOLLOWING ACUTE CORONARY SYNDROME

*Jelena Umbrasienė, Giedrius Vanagas, Jonė Venclovienė*

*Supervisor of the abstract: Giedrius Vanagas*

*Lithuanian University of Health Sciences, Department of preventive medicine, Lithuania*

### Introduction

As acute coronary syndrome (ACS) is still the leading cause of the death in the world, the international experts make the joint opinion on drugs treatment following ACS, that can impact on cardiovascular mortality. Due to international guidelines evidence-based treatment (EBT) should be widely used. However, due to many trials the use of EBT still not adequate in many countries.

### Aim

The aim of the study is to evaluate the prescription of EBT in the patients following ACS and this treatment impact on cardiovascular mortality.

### Objectives

To evaluate the EBT prescription in ACS patients as in-hospital treatment, EBT recommendation level at the discharge, also use of EBT during 1 year and 8 years periods following ACS.

To evaluate EBT failure impact on short term (1 year following ACS) and long term (8 years following ACS) cardiovascular mortality.

### Methods

A retrospective cohort study with a total of 613 patients following ACS in 2005-2013. Patients death was traced from the data from National Death Causes Registry. Data on in-hospital treatment collected from the Lithuanian University of Health Sciences Clinic of Cardiology Medical Records Data Base, and for treatment recommendations during 1 and 8 years following ACS was given by the National Sickness Fund Data Base „Sveidra“. The EBT algorithm have been created based on 2011-2012 ACS ESC guidelines, and covered the combined use of ACE inhibitors or ARBs, BB, statins,

aspirin or clopidogrel. Descriptive statistics was used for the frequencies evaluation. Logistic regression analysis have been used for the statistical risk assessment. The impact of EBT on cardiovascular mortality analysed using the standartized odds ratios with 95% confidence interval (CI), considered p level < 0.05 as significant. The Kaplan-Meier curves for survival rates in patients used EBT or not have been made.

## Results

On admission 358(58.4%) of the patients were treated with ACEI, 282(46%) with BB, 291(47.5%) with aspirin, 14(2.3%) used clopidogrel, 52(8.5%) - statins, and 3(0.5%) - ARBs. On discharge from the hospital 405(77%) were recommended to use ACEI, 382(72.6%) BB, 360(68.4%) aspirin. 222(42.2%) were prescribed with clopidogrel, 329(62.5%) with statins at the discharge. In 1 year period ACEI were used by 404(65.9%), BB by 405(66.1%), aspirin by 340(55.5%), clopidogrel by 93(15.2%) and statins by 199(32.5%) of the ACS patients. ARBs was used in 13(2.1%) of the ACS patients in 1 year after ACS. During 8 years after ACS alone use of ACEI was 585(95.1%), ARBs -175(28.6%), BB - 557(91%), clopidogrel - 323(53%) and statins was 380(62.1%). On admission at the hospital only 34(5.5%) of the ACS patients have been treated with EBT, at the discharge EBT was recommended to the 241(49.6%). During 1 year use of the EBT significantly declined till 129(21%) and in 8 years follow-up EBT was used by 231(37.8%) of the ACS patients. EBT used in 1 year follow-up (OR 0.532, CI 0.347-0.814, p = 0.004) and 8 years follow-up period significantly reduce CV mortality in ACS patients (OR 0.327, 95% CI 0.219-0.487, p < 0.001). The EBT failure 1 year (OR 2.038, CI 1.322-3.141, p = 0.001) and 8 years (OR 2.300, CI 1.610-3.286, p < 0.001) following ACS have been associated with significant increase of cardiovascular mortality.

## Conclusions

The EBT prescription rate at discharge and during 8 years follow-up after ACS is still inadequate in our study. The use of EBT significantly reduced CV mortality in 8 years follow-up in ACS patients. EBT prescription failure associated with significantly increased 8 year CV mortality in our study.

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## THE VALUE OF MYOCARDIAL DEFORMATION PARAMETERS AT REST AND DURING DOBUTAMINE STRESS IN PATIENTS WITH HIGH PROBABILITY OF CORONARY ARTERY DISEASE

*Marija Kinderyte, Ieva Gustaitė, Egle Ruzgyte*

*Supervisor of the abstract: Jolanta Vaškelytė, Tomas Lapinskas, Eglė Rumbinaitė*

*Department of Cardiology, LSMU, Lithuania*

### Introduction

Dobutamine stress echocardiography (DSE) is highly subjective and relies on the echocardiographer's experience. The

more objective, comprehensive and noninvasive diagnostic tool for evaluation of myocardial performance is still required.

#### **Aim**

The aim of this study was to determine the diagnostic value of left ventricle (LV) myocardial deformation parameters at rest and during Dobutamine stress to determine the hemodynamic significance of coronary artery stenosis in patients with high probability of coronary artery disease (CAD).

#### **Objectives**

To evaluate LV myocardial deformation parameters (systolic strain and diastolic strain rate) at rest and during Dobutamine stress in patients with hemodynamically significant coronary artery stenoses.

#### **Methods**

In order to determine the diagnostic value of strain and SR parameters during DSE we have chosen to investigate its associations with AMRI since it has been validated that fractional flow reserve results corresponds well to AMRI. Previous studies have shown that advanced echocardiographic techniques such as STI, which is widely used in resting echocardiograms, may be applied also in stress studies (4-5). After dividing patients into two groups according to AMRI, we did not observe any differences in echocardiographic parameters between the groups at rest, although systolic longitudinal strain was shown to be useful for detecting CAD at rest in several previous studies (4, 5-6). During 2013-2014 years we prospectively included 40 patients treated in the Department of Cardiology, Hospital of Lithuanian University of Health Sciences. The main inclusion criteria for participation in the study were high probability of CAD assessed according Diamond-Forrester pretest probability score (1997) and normal LV systolic function (ejection fraction  $\geq 55\%$ ). All patients underwent two-dimensional echocardiography using conventional DSE protocol and cine images were stored to evaluate LV deformation parameters at four different stages: at rest (BASE), during low (MIN) and high (MAX) doses of Dobutamine stress and during recovery (REC). Quantitative coronary angiography (QCA) was performed to assess CAD with significant stenosis defined as  $\geq 70\%$ . Hemodynamic significance of coronary lesions was proved by the Adenosine stress cardiovascular magnetic resonance (CMR). All patients were divided into two groups: ischemic (with reversible myocardial perfusion defect during Adenosine stress CMR and coronary artery stenosis  $\geq 70\%$  by QCA) and nonischemic (with normal myocardial perfusion during Adenosine stress CMR and coronary artery stenoses  $< 70\%$  by QCA). Myocardial deformation parameters of these two groups were compared using the Wilcoxon-Mann-Whitney U test and Student's t-test. Results were considered statistically significant when p value was  $< 0,05$ .

#### **Aim**

Evaluate treatment results of the patients that have been treated with BVS.

#### **Objectives**

1. Evaluate the rate of complications for patients that have been treated with BVS.
2. Evaluate the need for a repeated revascularization in patients with BVS.

#### **Methods**

Data of patients who have been treated with BVS stents, is stored and analyzed using retrospective survey. There were 21 consecutive patients, who have suffered from ischaemic heart disease in our survey. First of all, risk factors of our patients were collected (diabetes, hypertension, smoking). Coronarography and stenting with bioabsorbable stents was performed on all of these patients. Patients were observed while still in hospital and after three months and after one year after discharge from the hospital in case complications – major adverse cardiac events (MACE - death, thrombosis, myocardial infarction, stroke). Also, we evaluated length of hospitalisation and need for repeated revascularization. Data has been analyzed using SPSS V22.0 (Chi - squared test).

## Results

The inconsiderable amount of patients did not let us find the statistically significant differences between the participants of the study. Age mean of patients which participated in the study was 57 years of which 11 were males and 10 were females. More than half (71,4%) of participants had stabile angina pectoris with one vessel disease (47.6%), two vessel disease (23.8%), three vessel disease (28.5%). To determine the complexity of coronary artery disease we used the Syntax score and 47.6% of study participants had score more than 10 points. The risk factors such as arterial hypertension (95,2%) , diabetes (4.7%) , smoking (14.2%) , dyslipidemia (76.1%) were also evaluated. The study analyzed the most suitable technique aspects : 47.6% of patients had a long 28mm length stent with 3.5mm diameter. None of the complications were observed during one year period of time. The mean of hospitalisation time was  $6.25 \pm 2.58$  days.

## Conclusions

1. Patients have had none of the complications during one year time.
2. There was no need for repeated revascularization for patients who had been treated using bioabsorbable stents during one year period of time.

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## THERAPEUTIC HYPOTHERMIA FOLLOWING CARDIAC ARREST WITH THE USE OF EXTRACORPOREAL HEAT EXCHANGER

*Justinas Bacevičius*

*Supervisor of the abstract: Robertas Samalavičius, Pranas Šerpytis  
Vilnius University, Faculty of Medicine, Lithuania*

### Introduction

Therapeutic hypothermia following cardiac arrest is an established method to reduce neurologic injury following cardiac arrest. The methodology of hypothermia induced by extracorporeal heat exchanger was first introduced by Piegras A. et al. <sup>[1]</sup>.

### Aim

To evaluate efficacy of therapeutic hypothermia using extracorporeal heat exchanger for patients after cardiac arrest and resuscitation.

### Objectives

1. To evaluate the outcomes of treatment.
2. To assess efficacy of the device by time consumption.

### Methods

A retrospective cohort study of 36 consecutive cardiac arrest patients who were treated with therapeutic

hypothermia using extracorporeal heat exchanger in Vilnius University Hospital Santariškių Clinics from December 2011 to February 2015. Circuit consisted of percutaneously inserted cannulas into the femoral and jugular veins and external heat exchanger, which was connected with the centrifugal pump via tubing set. All patients were cooled to  $33 \pm 1$  C for 24 hours, then gradually rewarmed in 12 hours. Individuals received routine acute clinical care with monitoring of the vital signs by intensivists in charge; function of cooling system was supervised by percussionists. Statistical methods used: Student's T test, Chi square, Fisher's exact test.

## Results

Mean age of the patients was  $57,1 \pm 13,1$  yrs. Male female ratio was 29/7. 86,1% (n = 31) patients sustained out-of-hospital cardiac arrest, 13,9% (n = 5) – in-hospital cardiac arrest ( $p < 0,001$ ). Mean of Glasgow coma scale (GCS) evaluation at admission was  $4,2 \pm 1,6$  points (n = 16). The leading main diagnosis was myocardial infarction 69,4% (n = 25). Other options: pulmonary embolism (n = 2), suicide asphyxia (n = 2), ischemic stroke (n = 1), acute epiglottitis (n = 1), arrhythmia of unclear origin (n = 5). Emergency angioplasty was performed in 50,0% (n = 18) of patients usually before initiation of therapeutic hypothermia. Other procedures: Implantation of cardiac defibrillator (ICD) (n = 5), external temporary cardiac pacing (n = 3), extracorporeal membrane oxygenation (n = 1). At the time of discharge from 47,2% (n = 17) of alive patients, majority 38,9% (n = 14) had a favorable neurologic outcome. Hospital mortality was 52,8% (n = 19) ( $p = 0,63$ ). Mortality rate does not differ statistically from mortality rate of Niklas Nielsen et al. meta-analysis (48,6%,  $p = 0,64$ )<sup>[2]</sup>. Mortality in myocardial infarction group 52% (n = 13) did not differ significantly from the group of the rest causes 54,5% (n = 6) ( $p = 0,76$ ). Subjects resulting in favorable outcome were younger ( $49,9 \pm 10,9$  yrs.) than the rest ( $61,6 \pm 12,6$  yrs.) ( $p < 0,05$ ). Patients who were alive at discharge had less GCS points ( $5,7 \pm 1,6$  points) than ones who died ( $3,3 \pm 0,7$  points) ( $p < 0,01$ ). None of the subjects died who had GCS more or equal to 6 points ( $p < 0,05$ ). Mean time to reach target temperature was  $18,8 \pm 8,4$  min (n = 21). Mean cooling duration was  $38,6 \pm 14,7$  hours (n = 35).

## Conclusions

The intravascular cooling using external heat exchanger allows target temperatures to be reached rapidly. Patients outcomes match literature data.

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## UP - TITRATION OF MEDICATIONS FOR CHRONIC HEART FAILURE TREATMENT: DIFFERENCES BETWEEN CENTRES PARTICIPATING IN EUROBSERVATIONAL RESEARCH PROGRAMME

*Goda Maciulevičiūtė, Kristina Vasiljevaitė, Rasa Sadeckaitė*  
*Supervisor of the abstract: Aušra Kavoliūnienė*  
*Department of Cardiology, LSMU, Lithuania*

## Introduction

According to current European Society of Cardiology guidelines, neurohormonal blockers should be started at a low dose and slowly up- titrated to the maximal tolerated doses.

## **Aim**

To compare up-titration of neurohormonal blockers for ambulatory patients in Lithuania and other European centres participating in EURObservational Research Programme (EORP) Heart Failure Long - Term Registry.

## **Objectives**

To evaluate the number of patients in Lithuanian single university center who received the recommended pharmacological treatments at target doses and compare it with data from other European centres; to define the main reasons why the target doses were not reached in Lithuanian center.

## **Methods**

Patients were enrolled into the registry on a one-day-per-week basis. Data after one year follow - up (FU) were based on a visit to clinical center or by phone call after 12 months. In total 240 patients from our university centre were enrolled into EORP from May 2011 till March 2012. In total 7401 chronic heart failure (CHF) patients from 211 cardiology centers have been enrolled into EORP. Analysis data involves information about patients treatment, medication doses at baseline and changes of doses after 1 year, as well as analysis of reasons why target doses were not reached. Continuous variables are reported as median and interquartile range (IQR). Categorical variables are reported as percentages and compared using the  $\chi^2$  test. Continuous variables are compared by the t-test or the Mann - Whitney U-test. A P-value of 0.05 was considered statistically significant. All tests were two-sided. Analysis was performed with SPSS 22 program.

## **Results**

In Lithuania's single university center 67,1% patients received ACE - inhibitors at target doses while target doses have been reached just for 29,3% of patients in other European centers ( $p = 0,01$ ). In total 41,7% of patients in our center were still in up-titration phases, 34,3% have not reached target doses due to symptomatic hypotension, 4,6% – due to worsening of renal function and just a few patients – due to cough (1,9%) or high potassium level (0,9%). There were no statistically significant differences between up-titration of ARBs: just 16,7% of our patients and 24,1% of patients in other European centers were treated with ARBs at a target dose ( $p = 0,294$ ). The reasons of not treating the patients on recommended doses of ARBs didn't differ significantly: ongoing up-titration of the drug (35,3% in Lithuania and 32,4% in other European centers,  $p = 0,882$ ), symptomatic hypotension (23,5% vs. 25,9%,  $p = 0,745$ ), worsening renal failure (5,9% vs. 10,1%,  $p = 0,762$ ). Up-titration of BBs was of great difference: only 17,5% of patients according to overall European data used BBs in target doses; contrary majority of Lithuania's patients – 82,5% – with CHF reached target dosages of BBs suggested by the current guidelines ( $p = 0,01$ ). The main reasons of unsuccessful up-titration of BBs in our center were as follows: symptomatic bradycardia and hypotension (12,7% and 10,7%, accordingly), while bronchospasm was the reason for deviation from up-titration just for 5,4% of patients, worsening CHF – 6,3% and unknown reason for 11,2% of patients. The target doses of MRAs have been reached for almost half of the patients (52,1%) in our center and in less proportion (30,5%) in other European centers ( $p = 0,01$ ). Ongoing up-titration (56,6%), other or unknown reasons (19,1%), as well as hyperkalemia (15,4%) were the main reasons for not achieving the target doses.

## **Conclusions**

1. Statistically significantly more patients in Lithuania in comparison with other European centers received a target doses of ACE-inhibitors, Beta-Blockers and Mineralcorticoid Receptors Antagonists, except Angiotensin Receptors Blockers.
2. The main reasons why the target doses of neurohormon blockers have not been achieved were as follows: symptomatic hypotension for ACE-Inhibitors and Angiotensin Receptors Blockers, symptomatic bradycardia for Beta-blockers and hyperkalemia for Mineralcorticoid Receptors Antagonists.

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## VIZUALIZATION OF PORCINE HEART CORONARY VESSELS USING FLUORESCENT DYES IN VITRO

*Ugnė Lindžiūtė, Aistė Montvilaitė*

*Supervisor of the abstract: Rimantas Treinys*

*Department of Cardiology, LSMU, Lithuania*

### Introduction

Coronary heart disease is one of the leading causes of death in the world. The evaluation of the quality of coronary blood flow is an important factor in selection of methods and techniques for this disease treatment. Coronarography is the common procedure for this purpose. We seek to find a technique that would be less harmful for the patient and not dangerous for the physician. The usage of the fluorescent dyes for the visualization of the coronary arteries could be used as an alternative in the future, because it allows us to visualize structures without the usage of x-ray. Moreover, it is a convenient method to perform experiments with hearts in vitro – usage of the fluorescent dyes allows us to control the perfusion of the heart during the experiment. Fluorescent imaging is a widely used technique, some dyes are used in clinical applications (for example indocyanine green) and new possibilities are still emerging. In this study we used a porcine model of myocardial ischemia and visualized the ischemic zone with fluorescent dextran. Pig hearts are used to study the anatomy of human hearts because they are very similar in structure and size to human hearts. As in the human heart, the coronary arteries arise from their respective aortic sinuses. These similarities, combined with the fact that they are more available than human hearts, make them an ideal choice for research and study.

### Aim

Visualize the ischemic zone in porcine model of myocardial ischemia during retrograde perfusion in vitro.

### Objectives

1. Visualize coronary vessels of big animal (pig) heart by optical mapping method;
2. Induce acute regional ischemia and identify the ischemic zone in Langendorff perfused porcine heart.

### Methods

Explanted pig hearts (n = 3) were cannulated through the aorta and retrogradely perfused on Langendorff perfusion system. The perfusion was carried out under constant pressure (80 mmHg) with oxygenated (100% O<sub>2</sub>) Tyrode solution at 37° C. All the experimental procedures were approved by the State Food and Veterinary Service of the Republic of Lithuania. To visualize the coronary vessels a bolus injection of the fluorescent Tetramethylrhodamine Isothiocyanate-Dextran (MW40.000) was used. TRITC-dextran solution (9 mg/10 mL) was injected into the aorta through a bubble trap at slow speed (~3 mL/min) and optical recordings were acquired using fast EMCCD camera. The 532 nm laser for TRITC excitation and 580 nm emission filter for signal collection were used. To induce acute regional ischemia left coronary artery branch was occluded using a custom made inflatable balloon occluder. Made of an elastic silicon tube, the occluder was gently tied above coronary artery and inflated via an attached 2 mL syringe. The ischemic zone was identified optically comparing fluorescence level in different parts of myocardium. Recorded movies were analyzed using ImageJ 1.43m software: in chosen parts of arteries, veins and myocardium the fluorescence level every 1 second was collected. For calculation and statistical analysis Excel 2010 was used. The

results are expressed as mean  $\pm$  S.E.M. For statistical evaluation a paired Student's t-test was used, and a difference was considered significant when  $p < 0.05$ .

### Results

Experimental results showed that high speed injection (10 mL/min) of TRITC-dextran solution (dye) resulted in very intensive fluorescence in main vessels area with no possibility to identify separate arteries and veins, however very small branches were seen brightly. Relatively slow injection of the dye improved the visualization of coronary vessels and arteries and veins were seen separately. Fluorescence intensity increased in left coronary artery branch by  $101 \pm 6\%$  and in vein by  $72 \pm 8\%$  in comparing with background fluorescence (before staining), and the difference was significant. In myocardium area without big vessels the fluorescence level increased by 10%. After wash-out of the dye (~10 min after staining procedure) the fluorescence intensity remained ~20% higher than background in coronary artery and vein, but was increased only by 3% in myocardium. Before staining procedure the regional ischemia was induced by occlusion of coronary artery branch. During the dye injection the balloon occluder was released and the fluorescence intensity in implied ischemic zone (below the occlusion site) was measured. From the moment of the occlusion release the optical signal in this area rose suddenly by  $159 \pm 16\%$  and by  $71 \pm 5\%$  in artery and vein respectively, and by  $17 \pm 4\%$  in myocardium ( $p < 0.05$ ).

### Conclusions

1. TRITC-dextran injection to the aorta evoked fluorescence of perfusion solution in the mapping area and visualized coronary vessels of porcine heart.
2. The fluorescent dextran did not stain the coronary vessels and myocardium below the occlusion site indicating that the flow was fully stopped. This area was identified as an ischemic zone.

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## ENDOCRINOLOGY SESSION

# A COMPARISON OF DIAGNOSTIC CAPABILITIES OF ULTRASONOGRAPHY AND COMPUTED TOMOGRAPHY IN ADRENAL GLAND PATHOLOGY

*Arnas Urbonavičius, Rūta Ratyte*

*Supervisor of the abstract: Algirdas Basevičius*

*Department of Radiology, LSMU, Lithuania*

## **Introduction**

The diagnosis of adrenal gland pathologies is clinically very important, and should be accurate and timely. Several different methods are available for the evaluation of adrenal alterations: ultrasonography, computed tomography, magnetic resonance imaging, and positron emission tomography. The first two methods are used most often. While abdominal ultrasonography is the method of choice for the evaluation of adrenal glands, sometimes it is not efficient in diagnosing their alterations. In such cases, abdominal computed tomography should be performed.

## **Aim**

To compare the diagnostic capabilities of ultrasonography with those of computed tomography in detecting pathological formations in adrenal gland.

## **Objectives**

1. To evaluate the diagnostic capabilities of ultrasonography for the detection of adrenal gland pathology.
2. To identify the advantages of computed tomography in the evaluation of changes in the structure of the adrenal glands.
3. To compare the findings of ultrasonography and computed tomography.
4. To determine the mean body mass index (BMI) in cases when ultrasonography failed to detect adrenal gland pathology.

## **Methods**

This was a retrospective study of outpatient case-histories (n = 91) of individuals who had undergone both ultrasonography and computed tomography examinations in 2013 in the Hospital of the Lithuanian University of Health Sciences Kauno Klinikos, the Department of Endocrinology. The study did not include patients who had not undergone either ultrasonography or computed tomography. Computed tomography images were analyzed by different radiology specialists. The accuracy of computed tomography was equated to 100 percent. In this study, we evaluated the findings of ultrasonography and computed tomography, including the size and the number of pathological formations, and compared the diagnostic capabilities between the two methods. We also determined the correlation between our results and BMI. The results were analyzed by using SPSS 22.0 software package and Microsoft Office Excel 2010. Descriptive statistics was applied. The data were presented in percentages.

## **Results**

The patients' mean age was  $66.6 \pm 14$  years. In total, data on 91 patients (28% of them were males, and 72% - females) were analyzed. Ultrasonography (US) and computed tomography (CT) findings were the same in 58.44% of all cases, both when the analyzed data showed adrenal alterations and when they were not present. After the exclusion of cases without pathological findings in CT, the ability of US to detect the same pathology as CT dropped down to 40% of the cases. This means that in 60% of cases, US failed to detect a pathological formation that was present in CT scans. In 16.7% of the analyzed cases, US failed to visualize adrenal glands when a pathological formation was present in CT. In 15.4% of all cases, US failed to visualize adrenal glands at all. In 14.3% of patients, CT revealed more pathological formations than US did. The mean size of all pathological formations that were detected using US was  $2.94 \times 2.53$  cm, while the mean size of pathologies detected via CT was  $2.15 \times 2.02$  cm. The mean size of pathological formations that were not detected using US but were identified using CT was  $2.02 \times 1.59$  cm. US also demonstrated the probability of 19.35% to identify a false-positive pathology – i.e. when it was not present in CT. The analysis of the

influence of body mass on the diagnostic capabilities of ultrasonography showed that in cases when US failed to detect any adrenal glands anomalies, the mean BMI was  $34.69 \pm 9.26$  kg/m<sup>2</sup>.

### Conclusions

1. In almost half of the cases, US is able to detect a pathology.
2. CT is able to identify adrenal pathologies more accurately than US - especially when the pathological formations are smaller.
3. More than 50% of the time CT and US findings are the same. There is 1 out of 5 probability, that US tests will show false-positive results, and 15 out of 100 US tests will not visualize adrenal glands at all.
4. The mean body mass index in cases when US failed to detect a pathological formation present in CT scans was equal to  $34.69 \pm 9.26$  kg/m<sup>2</sup>.
5. Overall CT is a more effective method than US in determining adrenal gland pathologies, especially in obese patients.

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## ANALYSIS OF RECOMBINANT HUMAN GROWTH HORMONE THERAPY EFFECT TO GROWTH OF CHILDREN AND ADOLESCENTS WITH PITUITARY HORMONE DEFICIENCIES

*Rūta Miškinytė, Radvilė Dobrovolskytė*

*Supervisor of the abstract: Rasa Verkauskienė, Rūta Navardauskaitė*

*Department of Endocrinology of Lithuanian University of Health Sciences hospital Kaunas clinics, Lithuania*

### Introduction

Hypopituitarism is defined as a pituitary gland function disorder in which the pituitary gland fails to produce adequate amounts of pituitary hormones. These deficiencies can be either isolated or multiple, congenital or acquired. The most common is growth hormone (GH) deficiency but it can be followed by deficiency of thyroid-stimulating hormone (TSH), adrenocorticotropin hormone (ACTH) and finally gonadotropins [1]. The main clinical features of hypopituitarism are short stature, growth failure, and progressive decline in height velocity [2]. With the availability of recombinant hGH (rhGH), it has become possible to treat greater numbers of patients for a wider range of growth disorders [3].

### Aim

Analyze perinatal and postnatal data in patients receiving growth hormone therapy.

## Objectives

1. Evaluate manifestation of hormone deficiencies related to hypopituitarism.
2. Evaluate the effect of rhGH therapy to patient's growth.
3. Evaluate relationship between final and target, as well as final and predicted heights.

## Methods

We performed a retrospective analysis of medical records for patients with hypopituitarism treated in the Department of Endocrinology at the Lithuanian University of Health Sciences hospital Kaunas clinics. Data were collected and analyzed from a cohort of 155 children (105 boys and 50 girls) aged 0-17 years. The documentation reviewed included the perinatal and postnatal data (birth weight and length, weeks of gestation, height and weight during the first 5 years of age and during 5 years of rhGH treatment). Anthropometric parameters at birth were expressed as standard deviation scores (SDS) according to Swedish standards of birth size for specific gestation weeks [4]. Postnatal growth was assessed according to the Lithuanian National Children Growth Evaluation Charts [5]. Parental heights were self-reported and expressed as SDS of the normative data for 18-year-old men and women. Statistical analysis of the data was performed using SPSS v22 software. Paired t-tests were used for comparison of paired values, whereas one-sample t-test was used for comparing sets of standardized SDS data (final, target, and predicted heights). The differences were considered statistically significant when  $p < 0.05$ .

## Results

Most patients were born full-term (gestation weeks 37-41) with only 8 being born prematurely. The birth weights of patients ranged from -4.52 to +4.08. (mean  $-0.74 \pm 1.27$  SDS) and birth lengths from -5.0 to +4.06 (mean  $-0.15 \pm 1.046$  SDS). Mean height SDS decline over the first five years of life were:  $-1.56 \pm 1.17$ ,  $-2.2 \pm 1.15$ ,  $-2.45 \pm 1.13$ ,  $-2.83 \pm 1.13$ ,  $-2.85 \pm 1.15$  SDS. Regarding hormone deficiencies, 100% of patients had GH deficiency ( $n = 155$ ), 31.62% had TSH ( $n = 49$ ), 13.55% had ACTH ( $n = 21$ ), and 6.45% had gonadotropins ( $n = 10$ ) deficiency.

TSH deficiency was diagnosed earlier than GH deficiency (6.56 yrs. compared to 8.3,  $p = 0.001$ ), whereas the median age of diagnosis of ACTH was later (10.3 yrs.), and gonadotropins deficiency was diagnosed the latest (12.85 yrs). GH therapy was initiated with recombinant human growth hormone (Somatropin, rDNA-derived human growth hormone) at  $8.3 \pm 3.7$  years of age. At the start of GH administration, mean height SDS was  $-3.25 \pm 0.98$ , with a median bone age retardation of 2.41 years (max. -5.54, min. -0.74). GH replacement (dose  $0.028 \pm 0.003$  mg/kg/d, seven times per week, according the law of the Republic of Lithuania No. V-651) led to median growth velocities of: 8.64; 8.18; 7.06; 6.63; and 6.4 cm/yr. during the first 5 years of treatment.

Twenty-three patients achieved final height within the observation period. The final height achieved was not significantly higher than the predicted height (mean height SDS  $-1.82 \pm 1.34$  and  $-1.91 \pm 1.44$ , respectively,  $p = 0.260$ ). On the contrary, mean final height of the patients were significantly lower than their target height ( $0.92 \pm 0.9$  v.  $-1.82 \pm 1.34$ ,  $p = 0.001$ ).

## Conclusions

1. In patients diagnosed with multiple pituitary hormone deficiencies, the age at which they occurred from earliest to latest was as follows: TSH, GH, ACTH, and gonadotropins.
2. Recombinant human growth hormone therapy increased growth velocity during treatment period.
3. Pituitary hormone replacement therapy resulted in an increase of predicted adult height, although differences did not reach statistical significance. Patient's final height did not reach their target heights.

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## CELLS IN FIGHT AGAINST DIABETES MELLITUS

*Kamila Bąk, Daniel Piątek, Diana Bajerczak, Joanna Szydełko, Magdalena Amarowicz*

*Supervisor of the abstract: Aboguszewska Czubara*

*Medical Student's Association, Department of Clinical Chemistry, Medical University of Lublin, Polska*

### Introduction

Diabetes mellitus is a silent epidemic of XXI century. As current treatment including oral antidiabetic drugs and insulin doesn't protect against chronic and devastating complications of the disease, there is a need to detect new and more effective medicines. Such promising drug may be a newly-detected hormone – betatrophin.

### Aim

The aim of our study was to determine, for the first time, the concentration of betatrophin in serum of health pregnant woman, as well as, pregnant woman suffering from gestational diabetes.

### Objectives

1. The determination of the concentration of betatrophin in serum of health pregnant woman, as well as, pregnant woman suffering from gestational diabetes.
2. The determination of correlation between betatrophin concentration in the serum and the degree of development of diabetes mellitus.

### Methods

The experience was performed on 100 pregnant woman, who were divided into the control group (without gestational diabetes, 50 patients) and experimental group (with gestational diabetes, 50 patients). After all-night fasting from each women was taken a blood sample. Serum obtained after whirling will be used to detect betatrophin, adiponectin and osteoprotegerin with the use of the immunoenzyme methods (ELISA). The data would be analyzed with simple statistical method.

### Results

According to rare scientific reports the level of betatrophin is high in healthy pregnant woman. Nevertheless, there is no data about "behaviour" of this hormone during gestational diabetes. Our study revealed changeable levels of betatrophin health pregnant woman, as well as, pregnant woman suffering from gestational diabetes.

### Conclusions

Currently, diabetic therapy including oral antidiabetic drugs and insulin, doesn't protect against the development of chronic and destroying complications of the diabetes mellitus. This goal will be probably achieved through presented hormone – betatrophin.

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# CLINICAL FEATURES OF POST-OPERATIVE DIABETES INSIPIDUS AFTER ENDOSCOPIC TRANSSPHENOIDAL SURGERY OF PITUITARY ADENOMAS

*Ieva Vasiliūtė, Viktorija Ambroževičiūtė, Martyna Ramančiuckaitė*

*Supervisor of the abstract: Robertas Knispelis, Birutė Žilaitienė, Rimantas Žalinkevičius  
Lithuanian University of Health Sciences, Lithuania*

## Introduction

Transsphenoidal surgery has emerged as the standard approach for pituitary resection due to its minimally invasive approach. However, diabetes insipidus (DI) is a common complication following pituitary surgery [1]. According to recent studies, factors affecting the rate of DI include pituitary tumor size, adherence to surrounding structures, surgical approach, and histopathology of pituitary lesion [2].

## Aim

To evaluate clinical features of diabetes insipidus after transsphenoidally operated pituitary adenomas.

## Objectives

1. To evaluate frequency of postoperative diabetes insipidus between patients age distribution.
2. To determine relation of pituitary adenoma type and post-operative diabetes insipidus occurrence.
3. To evaluate probability of diabetes insipidus occurrence depending on total and subtotal surgical removal of pituitary adenomas.

## Methods

Clinical data of 333 patients, who had undergone endoscopic transsphenoidal surgery of pituitary adenomas at the Hospital of Lithuanian University of Health Sciences from year 2000 till 2010, has been analyzed retrospectively. Relationship between patients' age, tumor characteristics and postoperative occurrence of diabetes insipidus (DI) has been evaluated. Patients according to duration of DI clinical signs and urinary specific gravity were divided into two groups – patients with transient DI (TDI) and patients with permanent DI (PDI). The study sample consisted of 212 (63.66%) female and 121 (36.34%) male patients ( $p < 0.01$ ), with a mean age of  $50.01 \pm 15.66$  year (range 18-85 year). Collected data were processed and analyzed using the statistical package SPSS 20.0. Data was presented as means and their standard deviations ( $M \pm SD$ ) or mean and 95% confidence interval ( $\pm 95\% CI$ ). Mann-Whitney test has been used for the evaluation of significant differences between samples. The difference between proportions was confirmed using the chi-square ( $\chi^2$ ) criterion. The data has been considered as statistically significant when  $p < 0.05$ .

## Results

The patients' age distribution was as following: 19 patients (5.70%) were from 18 to <25 years, 75 patients (22.52%) from 25 to <40 (7.50%), 106 - (31.83%) from 40 to <55, and 94 - (28.22%) from 55 to ≤70 years. The subgroup analysis revealed that median age of PA diagnosis was 40-55 years (Logits 0.4). DI was significantly more frequent in 25-40 years ( $n = 23$ , 30.67%) and 40-55 years ( $n = 15$ , 14.15%) patients age groups,  $p < 0.01$ . Out of 333 cases DI after PA's surgeries occurred in 60 cases (18.01%). TDI was diagnosed for 51 patient (15.31%) and PDI for 9 patients (2.70%). Post-operative DI was more frequent in female patients ( $n = 45$ , 88.24%). Comparing PA's by size, DI was more frequent for patients who had macroadenomas ( $n = 51$ , 85%), in microadenomas group were only 9 (15%) cases. There was no significant difference between these groups. DI was mostly expected after non-functioning (38.33%,  $n = 23$ ), prolactin (36.67%,  $n = 22$ ) and growth hormone secreting PA's surgeries. The odds ratio for occurrence of TDI was 49.00 ( $\pm 95\% CI 30.02-79.99$ ,  $p < 0.01$ ) in GH secreting PA's group. In non-functioning PA's group odds ratio for TDI was 44.44 ( $\pm 95\% CI 33.29-59.34$ ,  $p < 0.01$ ) and in prolactinomas group 20.25 ( $\pm 95\% CI 15.07-27.22$ ,  $p < 0.01$ ). When analyzing relation between PA's surgical removal and DI occurrence, no significant difference was found between total or subtotal tumor resection. DI was equally frequent in both groups  $n = 30$  (16.57% DI cases after total PA's removal and 19.73% after subtotal).

## Conclusions

1. The most frequently post-operative DI occurred in age group from 25 to 40 and 40 – 55 years and majority of patients had transient DI.
2. Macroadenomas were related to more frequent DI occurrence and were mostly expected after GH secreting adenomas, non-functioning and prolactinomas operations.
3. Our study results show that success of surgical adenomas removal is not related to post-operative DI manifestation.

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## CLINICAL FEATURES OF TRANSSPENOIDALLY OPERATED PROLACTINOMAS IN A CONSECUTIVE SERIES OF 80 PATIENTS

*Viktorija Ambroževičiūtė, Martyna Ramančiuckaitė, Ieva Vasiliūtė*

*Supervisor of the abstract: Robertas Knispelis, Rimas Žalinkevičius, Birutė Žilaitienė*

*Department of Endocrinology, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

### Introduction

Prolactin (PRL)-secreting pituitary adenomas represent the most frequent hormonesecreting pituitary tumors. Women were mostly diagnosed early because of a secondary amenorrhea and galactorrhea, even so in men were relatively rare in the clinical setting, in which the proportion of men to women is 1:10, and are typically large relative to those in women[1]. Dopamine agonists (DA) have been recognized to be effective in the medical treatment of prolactinomas since the beginning of the 1970s. It has proved to be effective in suppressing PRL secretion, reducing prolactinoma size and restoring gonadal function in many studies[2].

### Aim

To evaluate clinical features of prolactinomas and dopamine agonists use before transsphenoidal removal operation.

### Objectives

1. To evaluate frequency of prolactin secreting adenomas in relation to patients gender and age.
2. To identify prolactinomas' size relation to gender.
3. To evaluate prolactinomas symptoms in relation to gender.
4. To estimate dopamine agonists therapy for prolactin secreting adenomas before microsurgical transsphenoidal surgery.

### Methods

Data were collected retrospectively from consecutive series of 80 patients who underwent surgery for PRL-secreting pituitary adenomas between 2000 and 2010 at the Hospital of Lithuanian University of Health Sciences. Within this period, in total 333 patients with pituitary adenomas were treated by transsphenoidal surgery. There prolactinomas constitute 24,02% of those operative series. This was the largest group among functional pituitary adenomas types. Presented data were processed and analyzed using the statistical package SPSS 20.0. Data were presented as means and their standard deviations ( $M \pm SD$ ) or mean and 95% confidence interval ( $\pm 95\% CI$ ), also Kolganov-Smirnov test was used there. Mann-Whitney test has been used for the evaluation of significant differences between samples. The difference between proportions was confirmed using the chi-square ( $\chi^2$ ) criterion. The data has been considered as statistically significant when  $p < 0.05$ .

## Results

The consecutive series consisted of 64 (80%) female and 16 (20%) male patients ( $p = 0.038$ ), with a mean age of  $36.65 \pm 13.78$  year (range 18-79 year). Mean age when prolactinoma was diagnosed was quite similar in males and females –  $37.06 \pm 13.85$  year in male group and  $36.55 \pm 13.87$  year in female group. All these patients underwent transsphenoidal removal surgery of prolactinomas.

Significant relation was found between gender and prolactinomas size. All microadenomas (One of the most often clinical sign of prolactinoma – galactorrhea - was more frequent in female group ( $n = 40, 93.02\%$ ) than in male group ( $n = 3, 6.98\%$ ),  $p = 0.002$ . Secondary amenorrhea before operation occurred in majority of female patients with prolactinomas ( $n = 41, 64.06\%$ ).

Majority of patients with microadenomas were treated with dopamine agonists before transsphenoidal adenoma removal operation ( $n = 19, 67.9\%$ ),  $p = 0.03$ . There was no association between DA use and gender of the patient. In total, approximately half of patients (males and females) were treated with dopamine agonists therapy before transsphenoidal prolactinoma removing surgery ( $n = 41, 51.25\%$ ). Our study results show that DA therapy doesn't influence surgical treatment option.

## Conclusions

1. More often prolactinoma occurred in females, but mean age among female and male groups did not differ significantly.
2. Prolactin secreting adenomas were larger in males.
3. Galactorrhea more frequently was observed in female group.
4. Dopamine agonist therapy was mostly used in microadenomas group before transsphenoidal prolactinoma removal operation.

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## DIFFERENCES IN SEX HORMONES IN ADOLESCENT GIRLS BORN SMALL AND APPROPRIATE FOR GESTATIONAL AGE

*Gintarė Plačinskaitė, Saulė Kiaunytė*

*Supervisor of the abstract: Rasa Verkauskienė, Indrė Petraitienė*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Small for gestational age (SGA) newborns are defined as babies whose birth length and/or weight are more than 2 standard deviations (SD) below the mean according to gestational age and sex [1]. In 2000-2008 in Lithuania approximately 6.5 percent of all babies were born SGA. It has been estimated that SGA girls are more likely to experience precocious puberty, earlier onset and faster progression of puberty and earlier age at menarche [2, 3].

### Aim

To compare differences in sex hormones of SGA and appropriate for gestational age (AGA) adolescent girls.

## Objectives

1. To compare differences in sex hormones of SGA and AGA girls. 2. To assess features of biochemical hyperandrogenism in SGA girls.

## Methods

The study was conducted in the Department of Endocrinology at Lithuanian University of Health Sciences Hospital. 70 girls were involved – 23 born SGA (33%) and 47 born AGA (67%). All girls were from the prospective SGA and AGA newborn cohort, formed in 1998 – 2000 and were 11-14 years old at the time of this study. All study subjects underwent anthropometric measurements and hormonal analyzes. Free androgen index (FAI) was calculated using formula  $[(\text{testosterone} / \text{SHBG}) * 100]$ . Statistical analysis was performed using IBM SPSS statistics 22 software package. Quantitative variables that did not follow a normal distribution were log-transformed before the analysis. Quantitative variables were described as the mean and standard deviation (SD). Study characteristics were compared using independent samples T tests for quantitative variables. A p value less than 0.05 was considered statistically significant. 70.8% of SGA and 38.3% of AGA girls were premenarcheal and from those who were post-menarche 38.9% had irregular menstrual cycles yet (57.1% SGA and 34.5% AGA). Analyzing differences between groups, data were adjusted for age and pubertal stage. In girls post-menarche blood samples were taken in follicular phase of menstrual cycle or least 2 months of secondary amenorrhea.

## Results

1. There were no significant differences in sex hormones concentrations between both gestational age groups: luteinizing hormone (LH): SGA  $4.26 \pm 3.80$  IU/L; AGA  $3.35 \pm 2.63$  IU/L; ( $p = 0.157$ ); follicle-stimulating hormone (FSH): SGA  $3.79 \pm 1.75$  IU/L; AGA  $4.08 \pm 2.33$  IU/L; ( $p = 0.983$ ); estradiol (E2): SGA  $326.86 \pm 208.01$  pmol/l; AGA  $427.45 \pm 309.91$  pmol/l ( $p = 0.616$ ). 2. Biochemical hyperandrogenism was evaluated: sex hormone binding globulin (SHBG) concentration: SGA  $40.83 \pm 16.46$  nmol/l, AGA  $44.11 \pm 20.76$  nmol/l ( $p = 0.881$ ); testosterone (T): SGA  $2.27 \pm 1.25$  nmol/l, AGA  $1.81 \pm 1.00$  nmol/l ( $p = 0.007$ ) and free androgen index (FAI): SGA  $6.979 \pm 6.72$ , AGA  $5.67 \pm 5.26$  ( $p = 0.048$ ).

## Conclusions

1. There were no differences in LH, FSH and E2 concentrations between SGA and AGA girls groups. 2. The difference in SHBG concentration was not significant, but girls from SGA group had significantly higher T concentration and FAI which are biochemical signs of hyperandrogenism.

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## EVALUATION OF HYPOGLYCEMIA IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS

*Rūta Miškinytė, Eglė Litvinaitė*

*Supervisor of the abstract: Rimantė Dobrovolskienė*

*Department of Endocrinology of Lithuanian University of Health Sciences hospital Kaunas clinics, Lithuania*

## Introduction

Hypoglycemia is the most common acute metabolic complication in type 1 diabetes [1]. For the child with type 1 diabetes, hypoglycemia can have a range of adverse consequences including unpleasant or embarrassing and potentially dangerous symptoms, impaired concentration, and behavioral disturbances. Diabetes education is critical to preventing hypoglycemia [2].

## Aim

Evaluate frequency and management of hypoglycemia in children and adolescents.

## Objectives

1. Evaluate manifestation of hypoglycemia related with age and disease duration.
2. Evaluate diabetes education and self-control with relation to hypoglycemia events.
3. Evaluate relationship between glycemic control and frequency of hypoglycemia and severe hypoglycemia.

## Methods

Data was generated using the “Genetic Diabetes in Lithuania” project, which is being conducted by the Endocrinology clinic located at the Lithuanian University of Health Sciences hospital Kaunas clinics. It started in November 2012 and will continue until April 2016. A questionnaire was given to all participants where they were required to detail their experiences with hypoglycemia and diabetes control, such as: how often they experienced episodes of hypoglycemia and severe hypoglycemia (5), glycated hemoglobin (HbA1c) levels with categories obtained from the International Society for Pediatric and Adolescent Diabetes (ISPAD) 2014:  $\leq 6.5$  (ideal), 6.5-7.5 (poor). Intravenous blood samples were taken and HbA1c levels were measured by a “Siemens DCA - Vantage analyzer”. Statistical analysis of the data was completed with SPSS v22 software using chi squared tests to determine if statistical significance exists between parameters. The results were only considered statistically significant when  $p < 0.05$ .

## Results

Among the participants, the average age was  $11.95 \pm 4.11$  and the percentage by age groups were as follows: 0-4 years (5.4%), 5-9 years (21.8%), 10-14 years (37.5%), 15-17 years (35.4%). According to the results of the questionnaire, 73% of participants reported experiencing hypoglycemia at least one time, whereas only 14% did not. There was a statistical significance in the relationship between age and hypoglycemia with younger children showing a lower frequency of hypoglycemia ( $p < 0.05$ ). According to the analysis, there was a significant relationship between duration of disease and hypoglycemia ( $p = 0.028$ ) with more hypoglycemia events occurring in participants having a disease duration of 0.5-5 years. Of the participants who did not visit a diabetes nurse, 22.8% experienced hypoglycemia. Of the participants who visited diabetes nurse more than four times per year, 6.3% experienced hypoglycemia ( $p < 0.05$ ).

## Conclusions

1. According to the data, it was shown that younger children exhibited less frequent episodes of hypoglycemia, but shorter disease duration resulted in more frequent episodes of hypoglycemia.
2. Upon analysis of the collected data, it was determined that participants who attended diabetes education experienced hypoglycemia fewer times.
3. When analyzing the data, it was found that poor glycemic control resulted in a higher frequency of hypoglycemia as well as severe hypoglycemia, however it was not statistically significant.

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## GESTATIONAL DIABETES AND THE ANALYSIS OF ITS RISK FACTORS

*Kristina Beržinytė, Justina Bieliauskienė*

*Supervisor of the abstract: Teresė Gritėnienė, Joana Kriščiokaitytė*

*Department of Obstetrics and Gynecology, LSMU, Lithuania*

### Introduction

Gestational diabetes (GD) is a variable degree of carbohydrate metabolism disorder that develops during pregnancy. Women with disrupted carbohydrate metabolism, usually in the second half of their pregnancy, develop hyperglycaemia, which is determined by the glucose tolerance test [1]. The glucose tolerance gets disturbed for women, whose pancreas fails to meet the body's need for insulin, and therefore they develop gestational diabetes. The real GD occurs between 24 to 36 weeks of pregnancy, but can develop earlier [2]. Sometimes it cannot be excluded that women could have had this disorder before pregnancy, but that it was not diagnosed. This diagnosis does not depend on whether they have been treated with insulin or not and on whether the condition continues after delivery [3]. Gestational diabetes is a condition where abnormal maternal metabolism affects fetal physiology, growth and development [4].

### Aim

To determine gestational diabetes diagnostic indicators and analysis of its risk factors.

### Objectives

1. To assess the risk factors for gestational diabetes. 2. To determine glucose concentration of capillary blood in the neonate. 3. To assess neonatal complications and risk factors in newborns, born to women with gestational diabetes mellitus.

### Methods

Statistical analyses was performed using SPSS ver.19 software. For qualitative data analysis we used Chi-square parameter and for quantitative-Student parameter. Nonparametric Mann-Whitney parameter was used for data comparisons. Along with that we performed logistic regression analysis to identify independent factors leading to a different outcome. For verification of statistical hypotheses, the significance level of ( $p < 0.05$ ) was chosen. The study was conducted in Department of Obstetrics and Gynecology of Hospital of Lithuanian University of Health Sciences. Medical documentation (form 113/a) was chosen by year (2011 -2014). The data of 5211 pregnant women was examined retrospectively. Women were divided into three groups: the experimental group—those who were diagnosed with gestational diabetes, the control group—randomly selected women who were not included in the risk group, and third group—maternal risk of diabetes. Diagnostic tests for every woman were carried out in the study: serum glucose levels in early pregnancy and urine tests for glycosuria. Glucose tolerance test was additionally conducted for women in risk and research groups. After birth, capillary blood glucose test was conducted for the infants. Women in gestational diabetes and risk groups, repeated glucose tolerance test 6-12 week after birth for the final diagnosis. Risk indicators were collected from medical documentation—maternal age, BMI, weight gained during pregnancy, reproductive history, family history of diabetes, polyhydramnios and others.

### Results

The results showed that in the risk and gestational diabetes groups blood serum glucose concentration during early pregnancy was significantly higher compared with the control group ( $5.09 \pm 0.17$  mmol /l ( $p < 0.01$ ) and  $4.60 \pm . ; 0.55$

mmol /l ( $p < 0.01$ ). and  $4.05 \pm 0.13$  mmol /l respectively). In early pregnancy an increased glucose concentration in blood serum is found almost 4.2 times more often in the risk group and 7.4 times in gestational diabetes group, in comparison with the control group. We found newborns, of women who were diagnosed with GD, 2.7 times more likely to have hypoglycaemia than those contained in the risk group. Furthermore, 28.9 times more likely than randomly tested infants in the control group. We found that women in GD group are significantly older ( $p < 0.01$ ) compared with at-risk pregnant women. Neonatal hypoxia was detected in 88(25.11%) in risk group, and in 7(26%) neonates whose mothers were in gestational diabetes group. Also in the control group - in 51 (9,77%) neonate. Macrosomia –is the most common newborn pathology in women with GD. In the risk group 74 (22,78%) women had previously given birth to large newborns, in GD group - 17(44.51%)and in the control - 34(10.08%). The BMI in risk ( $29.08 \pm 6.07$  kg/m<sup>2</sup>) and gestational diabetes( $25.03 \pm 4.09$  kg/m<sup>2</sup>) groups was significantly higher compared with the control group ( $22.01 \pm 2.45$  kg/m<sup>2</sup>,  $p < 0.01$ ).

### Conclusions

1.After the evaluation of the risk factors we found that pregnant women with confirmed gestational diabetes are older, their BMI is increased, they have almost 5.6 times more relatives who suffer from diabetes, more frequently their reproductive history is unfavorable, they are about 9 times more likely to have had large newborns in the past and 2.9 times more likely to now give birth to large newborns in comparison with a pregnant women in the control group. 2.We found that test group newborns, with mothers who had gestational diabetes, capillary blood glucose concentration is significantly higher than those ( $3,28 \pm 0,17$  mmol/l.), whose mother were in the control group ( $2,61 \pm 0,22$  mmol/l.). 3.Neonatal hypoglycemia and hypoxia occurs more frequently in newborns, whose mothers had gestational diabetes, when compared with the control group infants.

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## PARTICULARITIES OF CARDIOVASCULAR DISEASE IN PRIMARY HYPOTHYROIDISM

*Corina Scerbatiuc, Cristina Gheorghiu, Paula Fala*

*Supervisor of the abstract: Tamara Tudose*

*USMF "Nicolae Testimianu", Moldova*

### Introduction

Hypothyroidism is the most common pathological hormone deficiency. Even the minor lack of thyroid hormones can cause changes in metabolic processes, including dystrophic heart disorders. Hypothyroidism is associated with increased SVR, decreased cardiac contractility, decreased cardiac output, and accelerated atherosclerosis and coronary artery disease.

### Aim

These findings may be the result of increased hypercholesterolemia and diastolic hypertension in these patients. The blood pressure changes, alterations in lipid metabolism, decreased cardiac contractility, and increased SVR that

accompany hypothyroidism are caused by decreased thyroid hormone action on multiple organs such as the heart, liver, and peripheral vasculature and are potentially reversible with thyroid hormone replacement.

### **Objectives**

Reveal any clinical and paraclinical changes of cardiovascular system in patients with hypothyroidism group.

### **Methods**

This study is based on the clinical examination of 100 patients with hypothyroidism. The group consisted of 93 women (93%) and 7 men (7%). The average age of enrolled patients was 49.32 years (patients between 25 and 72 years). We divided the sample into three groups, according to TSH levels. The first one with TSH level not exceeding 4.05 mIU/l – paraclinical compensated. The second one with TSH value within 4.05 – 10 mIU/l and the third one with TSH level exceeding 10 mIU/l – patients with uncompensated hypothyroidism. We assessed the cause of hypothyroidism, strength of cardiac contractions, blood pressure, thyroid hormones and TSH values, blood lipid profile, ECG and EchoCG signs.

### **Results**

After analyzing the data from the study we found that hypothyroidism was more common in women and the primary cause that determined the thyroid hypofunction was autoimmune thyroiditis (53%). Physical examination and ECG revealed the presence of bradycardia in 13% of patients, but more frequently in patients with severe thyroid hormones deficiency (third group). The most common ECG signs were left ventricular hypertrophy, left bundle branch block and minor right bundle branch block. EchoCG indices were: interventricular septal thickening, hypertrophy of the posterior wall of the left ventricle and right ventricle enlargement, which were more frequently encountered in people with uncompensated hypothyroidism (third group). In patients included in the study we determined hypercholesterolemia (60.8%) and hypertriglyceridemia (32.97%), especially in patients with important hormone deficiency.

### **Conclusions**

The study shows that hypothyroidism is frequently associated with cardiovascular disorders, in which correlate with decreased thyroid hormone action. So the biggest changes were found in the group with more pronounced deficiency. The obtained results indicate the need EchoCG in all patients with hypothyroidism.

### **References**

List of references was not included.

## **PRE-OPERATIVE VISUAL IMPAIRMENT IN PATIENTS WITH PITUITARY ADENOMA**

*Ieva Vasiliūtė, Martyna Ramančiuckaitė, Viktorija Ambroževičiūtė*

*Supervisor of the abstract: Birutė Žilaitienė, Robertas Knispelis, Rimantas Žalinkevičius*

*Lithuanian University of Health Sciences, Lithuania*

### **Introduction**

Pituitary adenomas (PA) account for approximately 10-15% of clinically symptomatic intracranial tumors and one of the most symptoms is visual impairment [1]. Pituitary adenoma can cause visual field defects by compressing the optic chiasm or the optic nerve and the long-lasting compression induces primary optic nerve atrophy, which directly impairs the visual function [2].

### **Aim**

To investigate the visual impairment rate and relationship with tumor characteristics in patients with PA.

## Objectives

1. To determine visual impairment rate and visual impairment manifestation in patients with PA.
2. To evaluate relationship between PA size, hormonal activity and visual field (VF), visual acuity (VA) impairment.
3. To determine odds for having visual field defects in hormonally active PA.

## Methods

The retrospective single institution study of 333 patients with PA, who undergone transsphenoidal adenectomy at the Hospital of Lithuanian University of Health Sciences Kaunas clinics was performed during the period 2000 -2010. Suitable patients case-histories were identified from hospital's database and later reviewed by investigators. Data extracted from hospital's case-histories included patient sex, PA size, PA hormonal activity, VF and VA scores before operation. By the hormonal activity adenomas were classified as functioning and non-functioning PA. The visual impairment score was derived by combing the scores of best corrected VA and VF. The study consisted of 212 (63.66%) female and 121 (36.34%) male patients ( $p < 0.001$ ), with a mean age of 50.01 year ( $\pm 95\%$  CI 48.3-51.7). Presented data were processed and analyzed using the statistical package SPSS 20.0. Mann-Whitney test has been used for the evaluation of significant differences between samples. Data was presented as means and their standard deviations ( $M \pm SD$ ) or mean and 95% confidence interval ( $\pm 95\%$  CI). The difference between proportions was confirmed using the  $\chi^2$  criterion. One-way ANOVA was used to evaluate differences between means. The odds ratio was calculated using 2x2 table methodic. The data was considered as statistically significant at a confidence level of  $p < 0.05$ .

## Results

158 (47.45%) of patients presented with non-functioning PA, 175 (52.55%) with functioning PA. Among the functioning PA there were 80 (45.71%) prolactinomas, 74 (42.29%) growth hormone (GH) and 16 (9.14%) adrenocorticotrophic hormone secreting PA. 150 (45.05%) patients complained of visual impairment and objective visual impairment was found in 182 (54.65%) patients ( $p = 0.032$ ): 171 (51.35%) had VA impairment and 108 (32.43%) - VF defects. PA size in patients with VF defects was significantly larger ( $3.17 \pm 1.08$  cm) than in patients with normal range of vision ( $1.83 \pm 1.01$  cm) (ANOVA,  $F = 121.79$ ,  $df = 331$ ,  $p < 0.001$ ). Significantly larger PA were observed in patients with VA impairment ( $2.82 \pm 1.11$  cm) than in patients with normal VA ( $1.68 \pm 1.02$  cm) as well as differences (ANOVA,  $F = 94.70$ ,  $df = 331$ ,  $p < 0.001$ ). In 83 (76.85%) cases of VF defects, patients had non-functioning PA, in 11 (10.19%) of cases – GH secreting PA and 13 (12.04%) – prolactinomas,  $p < 0.001$ . We confirmed that in patients with non-functioning PA of having VF defects odds ratio is 1.22 ( $\pm 95\%$  CI 1.1-1.37,  $p = 0.184$ ) and odds ratio for having normal VF in patients with GH secreting PA and prolactinomas were respectively 8.86 ( $\pm 95\%$  CI 7.94-9.9,  $p < 0.001$ ) and 8.21 ( $\pm 95\%$  CI 7.36-9.17,  $p < 0.001$ ). Comparing PA by hormonal activity, VA impairment occurred in 123 (71.93%) patients with non-functioning and in 48 (28.07%) with functioning PA: 25 (52.08%) GH secreting, 20 (41.67%) prolactinomas and 3 (6.25%) – other PA,  $p < 0.001$ .

## Conclusions

1. More than half patients with PA had visual impairment and more cases of visual impairment was diagnosed during neuroophthalmological investigation if compare to subjective complaints of patients. 2. In patients with VF defects and in patients with VA impairment, PAs were larger than in patients with normal vision and visual impairment were more commonly caused by non-functioning PA. 3. Odds ratio of having VF defect was higher in patients with non-functioning adenoma and patients with GH secreting adenomas had higher odds for normal VF if compare with prolactinomas cases.

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# SEXUAL FUNCTION IN YOUNG LITHUANIA WOMEN WITH POLYCYSTIC OVARY SYNDROME: A PROSPECTIVE CROSS SECTIONAL STUDY

*Justina Sematonyte, Vilija Danylaite, Lina Ciaplinskiene, Dalia Kozloviene, Malvina Pagareckaite*

*Supervisor of the abstract: Birute Zilaitiene*

*Department of Endocrinology, LSMU, Lithuania*

## **Introduction**

Polycystic ovary syndrome (PCOS) is a common endocrine disorder in women of reproductive age, which influences metabolic, psychological and sexual aspects of their life [1, 2]. Parameters used to define PCOS include irregular menses, hirsutism, acne and elevated serum testosterone levels [3]. Although obesity is not included in the diagnostic criteria for PCOS, many women with PCOS are obese [4]. The impact of these physical and physiologic characteristics on sexual satisfaction has been studied, because little is known about the effects of PCOS on overall sexual functioning, phases of the sexual response cycle, and sexual satisfaction.

## **Aim**

We aimed to evaluate the sexual function of women (either obese or nonobese) with PCOS in comparison to age-matched young women with regular cycles.

## **Objectives**

1. To compare sexual function between women with PCOS and age-matched young healthy women.
2. To determine if BMI and the frequency of menses significantly affect sexual function.
3. To assess whether serum testosterone levels or hirsutism have any impact on sexual function.

## **Methods**

In this prospective cross-sectional study, 40 women with PCOS (aged  $27,02 \pm 4,54$ ) were compared with a control group of 40 healthy volunteers (aged  $25,28 \pm 4,37$ ). All women used barrier contraception methods at the enrolment into the study. Standard anthropometrics measurements were performed. Body mass index (BMI) was calculated based on the following formula:  $\text{weight (kg)} / [\text{height (m)}]^2$ . Definitions for BMI categories in  $\text{kg/m}^2$  were underweight (lower than 18.5), optimal weight (18,5–24,9), overweight (25-29,9) and obese (30 and more). The extent of terminal hair growth was determined using the modified FerrimanGallwey (mFG) scoring system [5]. The Female Sexual Function Index (FSFI) by Rosen et al. [6] was used to assess women's general sexual functioning. It is a brief, 19- item self- report measure of female sexual function that provides scores on five domains of sexual function as well as total score (minimal score- 2,0 and maximal score- 36,0). The domains assessed have been confirmed using factor analyses and include desire, arousal, lubrication, orgasm, satisfaction and pain. This is a well-established tool and was validated in the Lithuanian language [7]. The response options on Likert-type scales are used to calculate the separate domain scores and an overall score for sexual function. Scores were then calculated and statistically analysed. Women with total FSFI scores of less than 26,55 were classified as "being at high risk" for female sexual dysfunction (FSD). Testosterone and SHBG were measured by radioimmunoassay kits, produced by DIA source (Belgium). Statistical analysis was conducted using SPSS 20 software. The results were expressed as mean value  $\pm$  standard deviation (SD). The Kolmogorov–Smirnov test was used to test the normality of distribution. The Pearson test was used for bivariate correlations. Chi-Square or Fisher's tests were used to compare categorical variables. Statistical significance was taken at  $p < 0,05$  throughout.

## **Results**

Mean FSFI score in women with PCOS was  $24,89 \pm 10,61$ , in the control group  $24,71 \pm 7,16$  ( $p = 0,498$ ).

There were no significant differences in the FSFI domains scores between groups as well ( $p > 0.05$ ).

65% of women in PCOS and 65% in the control group were at risk for sexual dysfunction ( $p = 0,946$ ).

PCOS women with normal BMI had a better sexual function than obese women with PCOS ( $p = 0,041$ ). Women with amenorrhea (3 and less menstrual cycles per year) had worse sexual function than women with oligomenorrhea (4-8 cycles per year) ( $p = 0,045$ ). Neither testosterone concentration nor hirsutism score were related to the sexual function of women in both study groups.

### Conclusions

The sexual function in women with PCOS did not differ from their age matched healthy counterparts. The obesity and irregular menstrual cycles affected negatively on a total FSFI score. The data from the study demonstrated that serum testosterone level and hirsutism did not play a significant role in sexual function in women with PCOS.

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## THE CLINICAL FEATURES OF TRANSSPHENOIDALLY OPERATED PITUITARY ADENOMAS: THE RETROSPECTIVE SINGLE-CENTRE STUDY

*Viktorija Ambroževičiūtė, Ieva Vasiliūtė, Martyna Ramančiuckaitė*

*Supervisor of the abstract: Robertas Knispelis, Rimas Žalinkevičius, Birutė Žilaitienė*

*Department of Endocrinology, LSMU, Lithuania*

### Introduction

The number of studies on the incidence of pituitary adenomas and outcomes of surgical treatment is still limited, despite that pituitary adenomas are between the most frequent intracranial tumours that constitute 10-15% of all primary brain tumours and 85% of all sellar tumours [1]. Since neuroimaging techniques have improved, pituitary tumours are more often diagnosed incidentally. Recent studies made in other clinical centres around the world have showed that surgical excision using the endoscopic transsphenoidal surgery is recognised as the best option to treat pituitary adenomas [2].

### Aim

To evaluate clinical features of transsphenoidally operated pituitary adenomas.

### Objectives

1. To evaluate pituitary adenomas size and gender relation.
2. To evaluate pituitary adenomas size by type and pituitary adenomas types frequency.
3. To evaluate the likelihood of complete pituitary adenomas surgical removal in relationship to tumour size.

## Methods

The retrospective single institution study was performed at the Hospital of Lithuanian University of Health Sciences Kaunas Clinics. 333 patients, transsphenoidally operated due to pituitary adenomas during the period 2000-2010 were involved in the study. Data was collected retrospectively from the patients' medical records. Patients were divided into two groups based on hormonal activity of pituitary adenomas - patients with functioning and non-functioning adenomas, according to radiological tumour size before operation to - patients with microadenomas (<1cm) and macroadenomas (≥1cm). The series consisted of 212 (63.66%) female and 121 (36.34%) male patients ( $p < 0.001$ ), with a mean age of  $50.01 \pm 15.66$  year (min/max - range 18-85 year). Presented data was processed and analysed using the statistical package SPSS 20.0. Data is presented as means and their standard deviations ( $M \pm SD$ ) or mean and 95% confidence interval ( $\pm 95\%$  CI). Mann-Whitney test has been used for the evaluation of significant differences between samples. The difference between proportions was confirmed using the chi-square ( $\chi^2$ ) criterion. The data has been considered as statistically significant when  $p < 0.05$ .

## Results

The mean patients' age was 50.01 year ( $\pm 95\%$  CI 48.3-51.7) and average adenomas' size 2.27 cm ( $\pm 95\%$  CI 2.14-2.40). Tumour size was significantly associated with gender: in female group it was smaller than in male group ( $2.07 \pm 1.2$  cm vs  $2.60 \pm 1.2$  cm,  $p = 0.0001$ ).

Non-functioning tumours were presented in 158 (47.45%) and functioning in 175 (52.55%) patients. There was 80 (45.71%) prolactinomas, 74 (42.29%) growth hormone (GH) and 16 (9.14%) adrenocorticotrophic hormone (ACTH) secreting adenomas among the functioning adenomas.

Significant relationship was found between pituitary adenomas size and type. Comparing functioning and non-functioning adenomas by size most common macroadenomas were non-functioning - 155 cases (54.39%). In 66 cases (23.16%) GH secreting adenomas were diagnosed and in further 53 cases (18.60%) - prolactinomas ( $p > 0.001$ ).

Non-functioning adenomas statistically were significantly larger than GH, prolactin, ACTH secreting adenomas ( $p < 0.001$ ). Also prolactinomas and GH secreting adenomas were larger than ACTH secreting adenomas ( $p = 0.012$ ).

Gross total removal as reported by surgeons just after the operation was achieved in 181 (54.35%) of all cases ( $p = 0.02$ ). The highest chance for total tumour removal was achieved in macroadenomas (size  $\geq 1$  cm) group (77.35%),  $p < 0.0001$ . This result should be cautiously interpreted because of low number of microadenomas in the study group ( $n = 48$ ; 14.41%).

## Conclusions

1. Pituitary adenomas are smaller in female group. 2. The relation between tumour size and hormonal activity was found: the most common adenomas were functioning and majority of them were prolactin secreting adenomas. Otherwise non-functioning pituitary adenomas were larger than GH, prolactin, ACTH secreting adenomas. 3. The highest chance for total tumour removal was detected in macroadenomas group.

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## THE PREVALENCE OF PHENOTYPIC AND METABOLIC DISORDERS AND THEIR DIFFERENCES BETWEEN VARIOUS KARYOTYPES IN TURNER'S SYNDROME

*Jūratė Drazdauskaitė, Rūta Nakaitė*

*Supervisor of the abstract: Rūta Krikščiūnienė, Birutė Žilaitienė*

*Lithuanian University of Health Sciences, Department of Endocrinology, Lithuania*

## Introduction

Turner's syndrome (TS) is defined as complete or partial absence of one sex chromosome and affects about one of 2000 liveborn females [3]. The syndrome is characterised by short stature, gonadal dysgenesis, and is associated with number of congenital abnormalities including cardiovascular malformations, renal anomalies, carbohydrate metabolism disorders, thyroid dysfunction, osteoporosis etc. [1, 2]. The wide range of somatic features in Turner's syndrome indicate that a number of different X-located genes are responsible for the complete phenotype [3].

## Aim

To evaluate the prevalence of phenotypic and metabolic features and their differences between 45,X monosomy and other various karyotypes in women with TS.

## Objectives

1. To estimate the prevalence of 45,X karyotype in TS. 2. To evaluate the prevalence of low birth weight newborns (LBW), body mass index (BMI) changes, glucose intolerance and bone mineral density (BMD) decrease in women with TS. 3. To estimate the prevalence of other disorders: cardiovascular pathology, renal anomalies, thyroid dysfunction in women with TS. 4. To compare phenotypic and metabolic features between 45,X karyotype and other karyotype variants groups.

## Methods

The retrospective data of 117 women with TS from database of Hospital of Lithuanian University of Health Sciences was analysed. The inclusion criteria were age (older than 18 years) and genetic verification of TS. 52 patients were excluded because of lack of medical history, 10 of them have not matched the inclusion criteria. 55 women were enrolled into the study. The prevalence of LBW newborns, overweight or obesity, impaired glucose metabolism, decreased bone mineral density (BMD) in adulthood, other disorders (cardiovascular disease, thyroid dysfunction, renal anomalies) were counted in this study. All women were divided into two groups: 45,X karyotype group (45,X; n = 35) and other karyotype variants group (non 45,X; n = 20). The prevalence of phenotypic (LBW, cardiovascular disease, thyroid dysfunction, renal anomalies) and metabolic (overweight or obesity, impaired glucose metabolism, decreased BMD) disorders were compared between the groups. Statistical analysis was performed using SPSS 17.0 statistical package. Due to low sample size, differences between 45,X and non 45,X groups were compared using the chi-square ( $\chi^2$ ) criteria. Data was considered as statistically significant at a confidence level of  $p < 0,05$ .

## Results

Late metabolic outcomes (overweight or obesity, impaired glucose metabolism, decreased BMD) were evaluated at median age of 24 years [18 – 40]. 45,X variant of karyotype (63.6%) was significantly more common than other karyotype variants (36.4%) in this study ( $p = 0.043$ ). Normal newborns birth weight (75.0%) was found more frequent than low birth weight (25.0%;  $p = 0.001$ ). Normal glucose levels (84.4%) were estimated more frequent than impaired glucose tolerance (15.6%),  $p < 0.001$ . Normal BMI was found in 58.8% women with TS, the prevalence of overweight or obesity was 41.2%,  $p = 0.208$ . Decreased BMD occurred in 57.9% and normal BMD – in 42.1% patients of the study ( $p = 0.947$ ). Thyroid dysfunction was significantly more frequent (85.2%) than normal thyroid function (14.8%),  $p < 0.001$ . Renal anomalies (26.3%) were rarer than normal findings (73.7%) in women with TS ( $p = 0.039$ ). Cardiovascular diseases occurred in 69% of patients ( $p = 0.041$ ) but no difference between 45,X and non 45,X groups (77.8% and 54.5%;  $p = 0.189$ ) were found. There were no differences found in prevalence of overweight or obesity (45,X - 44.1%, non 45,X - 35.3%;  $p = 0.546$ ), LBW (45,X – 27.6%, non 45,X – 20%;  $p = 0.582$ ), impaired glucose tolerance (45,X – 86.7%, non 45,X - 80%;  $p = 0.561$ ), decreased BMD (45,X – 57.1%, non 45,X – 60%;  $p = 0.875$ ) and other pathological features (renal anomalies (45,X - 40%, non 45,X - 11.1%;  $p = 0.153$ ), thyroid dysfunction (45,X – 93.7%, non 45,X – 72.7%;  $p = 0.131$ )) between these two groups.

## Conclusions

1. The prevalence of 45,X karyotype was significantly more common in this study than other karyotype variants. 2. Birth weight, BMI and glucose levels in adulthood were found in normal range significantly more often than in

pathological range in women with TS. 3. The prevalence of cardiovascular disorders and thyroid diseases were estimated more frequent than normal function in women with TS . 4. Phenotypic and metabolic features did not have significant differences between 45,X and non 45,X groups.

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## **INTERNAL MEDICINE SESSION**

# ACUTE PULMONARY EFFECTS OF ELECTRONIC CIGARETTES IN HEALTHY NON-SMOKERS

*Matas Viršilas*

*Supervisor of the abstract: Kęstutis Malakauskas*

*LSMU Pulmonology department, Lithuania*

## Introduction

Tobacco smoking is a major risk factor for developing lung diseases. Nowadays, there are various new smoking devices like electronic cigarette (e-cigarette) which can have different effects on the respiratory tract.

## Aim

To determine acute effects of e-cigarettes to the respiratory tract and compare these effects produced by conventional cigarettes in a healthy non-smokers.

## Objectives

1. Estimate acute effect on lung function after e-cigarette and conventional cigarette.
2. Compare the changes on respiratory tract pH values after acute exposure of e-cigarette and conventional cigarette.
3. Measure the amount of carbon monoxide in exhaled breath after smoking e-cigarette and conventional cigarette.

## Methods

The study included 12 non-smokers healthy volunteer students from the LSMU. Firstly, spirometry was performed to all subjects. Afterwards, carbon monoxide (CO) in exhaled breath with PiCO+ Smokerlyzer (Bedfont Scientific, UK) was measured. Later, exhaled breath condensate (EBC) was collected 15 minutes breathing with EcoScreen device (E. Jaeger, Germany). Thereafter, the pH of the EBC was measured with pH-meter (Mettler Toledo, USA). For every subject spirometry, CO measurement and EBC collection with pH measurement were performed three times: first - at baseline, second – 1 hour after smoked conventional cigarette (C. sample) and third - 1 hour after smoked e-cigarette (El. sample). All subjects smoked conventional cigarette or e-cigarette in random order with interval of 1 day at least. Subjects inhaled 15 breaths of e-cigarette with cherry flavour 6mg/ml nicotine liquid (BDC Aspire CE5, China), and 15 breaths of conventional cigarette (Marlboro, Philip Morris, Lithuania). Statistical analysis was performed using Friedman nonparametric test. Data presented as mean,  $\pm$  standard deviation.

## Results

Twelve individuals (mean age  $24,2 \pm 1,6$  years), 6 women and 6 men participated in the study. There were no significant changes in lung function means like FVC (forced vital capacity), FEV1 (forced expiratory volume in 1 second), FEV1/FVC(forced expiratory volume in 1 second /forced vital capacity), MEF50%(maximum expiratory flow at 50%) after smoking e-cigarette and conventional cigarette. EBC pH values significantly decreased after smoking conventional cigarette, from  $6,77 (\pm 0,04)$  to  $6,57 (\pm 0,38)$ ;  $p = 0,001$ . While e-cigarette smoking did not change EBC pH values. CO parts per million (ppm) mean increased from  $1,67\text{ppm} (\pm 0,89)$  to  $2,75\text{ppm} (\pm 1,36)$ , after smoking conventional cigarette ( $p = 0,024$ ). E-cigarette had no effect on the level of CO ppm.

## Conclusions

1. Neither e-cigarette, nor conventional cigarette exposure had no acute effect on lung function, measured by spirometry. 2. EBC pH value after smoking conventional cigarette significantly decreased, but after e-cigarette there was no change. 3. Measurements of carbon monoxide ppm in exhaled breath increased after smoking conventional cigarette, however after e-cigarette there was no change. In conclusion, e-cigarette short-term usage did not demonstrate acute pulmonary effect on airways comparing to that traditional cigarette. However this research cannot conclude about safety of e-cigarette and long-term health effects are still unknown, further and more extensive investigations are needed.

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## CHANGES IN CHARACTERISTICS OF HEPATITIS C PATIENTS SEEN DURING TWO LAST DECADES

*Lina Kievišienė, Mantas Kievišas*

*Supervisor of the abstract: Vitalija Petrenkienė*

*Department of Gastroenterology, LSMU, Lithuania*

### Introduction

Hepatitis C virus (HCV) is a serious global health issue. Approximately 150 million people worldwide are infected with HCV. Multiple HCV genotypes with several distinct subtypes have been described. Studies report that patients with a history of unscreened blood transfusion were mostly infected with subtype 1b while genotype 3 was more prevalent among intravenous drug users. In recent years, a shift in the prevalence of HCV genotypes has been reported worldwide. With the implementation of screening of blood for HCV in the early 1990s in Lithuania, the risk of transfusion-associated HCV infections had decreased. Understanding changes in epidemiological characteristics, HCV genotypes, as well as other hepatitis C characteristics plays an important role both in patients' clinical management and in developing new preventive strategies. Little is known about changes in chronic hepatitis C (CHC) characteristics in Lithuania.

### Aim

To compare characteristics of the patients diagnosed with CHC infection in two last decades at the Hospital of LSMU.

### Objectives

1. To analyze and compare demographic characteristics of the patients diagnosed with CHC infection in two last decades.
2. To examine the difference in proportions of HCV genotypes of the patients diagnosed with CHC infection in two last decades.
3. To compare histological stages of liver fibrosis of the patients diagnosed with CHC infection in two last decades.

### Methods

This was a retrospective study of 460 patients seen in 1995-2014 in the Out Patient Gastroenterology Department of Hospital of LSMU. Adult patients with serologically proven CHC infection (serum HCV-antibody and HCV RNA positivity) and with no evidence of other liver diseases were included in to the study. Patients with missing genotypes, acute HCV, HBV or HIV coinfection were excluded. Patients were divided into two groups: diagnosed with HCV infection in 1995-2004 (Era-1) and diagnosed in 2005-2014 (Era-2). The following data were recorded: 1) demographics (age, sex); 2) HCV genotype at any point in time; 3) liver fibrosis stage according Ishak fibrosis staging system on a scale from F0-F6 within 12 months of the diagnosis. Statistical analysis was performed using SPSS 22.0 software package. Normality of data was checked by the Kolmogorov-Smirnov test. Categorical variables were compared using chi-square ( $\chi^2$ ) and continuous variables using the Student's t-test. Quantitative data were expressed as mean and standard deviation. P values of less than 0,05 were considered significant. The Ethics committee of Hospital of LSMU approved this study (approval Nr. BEC-MF-432).

## Results

351 (76,3%) patients were included – 75 in Era-1 and 276 in Era-2. Patients in Era-2 were older than Era-1 patients: mean age 39,6 (11,3) vs 45,7 (14,1) years ( $P < 0,001$ ). There were no statistically significant difference between proportions of genders (53,3% of males and 46,7% of females in Era-1 and 55% of males and 45% of females in Era-2). Compared to Era-1, there was a statistically significant increase in genotype 3 (16% vs 34,8%,  $P = 0,001$ ) and a decrease in genotype 1b (46,7% vs 30,1%,  $P = 0,004$ ) and total genotype 1 (78,7% vs 59,4%,  $P = 0,001$ ) in Era-2. Proportions of other genotypes remained stable (2,7% vs 2,2% of genotype 1a; 29,3% vs 27,2% of genotype 1 unknown or unspecified subtype; 5,3% vs 5,8% of genotype 2, respectively). A significantly higher percent of patients in Era-2 had Ishak F5-F6, 20,5% vs 6,7% ( $P = 0,006$ ). Differences between other stages of liver fibrosis were not statistically significant (Ishak 0-2 – 60% vs 57,3%; Ishak 3-4 – 33,3% vs 22,2%, respectively).

## Conclusions

1. Patients in Era-2 (2005-2014) were older compared to those seen a decade ago (Era-1, 1995-2004).
2. In Era-2 there was a significant increase in genotype 3 and a decrease in both genotype 1b and total genotype 1.
3. In Era-2 a significantly higher percent of patients had liver cirrhosis.

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## CORRECTION NEEDS ASSESSMENT OF THE METABOLIC SYNDROME DEPENDING ON ITS IMPACT ON THE COURSE OF TREATMENT OF PSORIASIS AND CORRELATION WITH CORONARY HEART DISEASE

*Aurelija Emilija Aukštikalnytė*

*Supervisor of the abstract: Nauris Grušauskas*

*Department of Skin and Venereal Diseases, LSMU, Lithuania*

## Introduction

Metabolic syndrome is a disease with multiple pathophysiological changes in human body which increase the risk of coronary heart disease (as heart attack or stroke) and type 2 Diabetes. Over the last decade, new information on coronary heart disease risk factors in the growth rate may be estimated as exponential. Research carried out in patients with psoriasis population of nearly 7 times more likely to be determined is the progress of various diseases which manifest as a result of metabolic disorders and ischemic heart disease together. Psoriasis is a chronic inflammatory skin disease with recurrent course. Psoriasis is often evaluating as a skin lesions and concomitant illness complex. About 35-40 per cent of the cases of psoriasis proceed as severe, requiring innovative systemic treatment.

## Aim

Evaluate the metabolic syndrome connection with ischemic heart disease and to determine the impact on the course of treatment of psoriasis.

## Objectives

1. Assess the diagnostic value of the criterion of metabolic syndrome and evaluate its informative presentation to the psoriasis course.
2. To evaluate the frequency of metabolic syndrome and its clinical components complexity in patients with psoriasis.
3. To evaluate the metabolic syndrome connection with ischemic heart disease among patients with psoriasis.

## Methods

The study included dermatovenerological patients of Kaunas Clinical Hospital (N=219), which were hospitalized for psoriasis in 2010 -2014 m. The data was collected on socio-demographic characteristics, medical history of psoriasis and established PASI score in the beginning of treatment. To evaluate the severity of psoriasis were used Psoriasis Area and Severity Index (PASI). Metabolic syndrome was defined by Adult Treatment Panel III criteria for the presence of three or more from five components: central obesity (waist circumference >102/88 cm (men/women)); fasting plasma glucose >6.1 mmol/l; triglycerides >1.7 mmol/l; high density lipoprotein cholesterol <1.04/1.3 mmol/l (men/women); systolic/diastolic blood pressure >130 and/or 85 mmHg. Ischemic heart disease was diagnosed as previous myocardial infarction, angina pectoris or ischemic changes in electrocardiogram. Life style habits were evaluated using frequency questionnaire. The relationship between metabolic syndrome and IHD in consideration of age and smoking habits was estimated using logistic regression. Statistical analysis was performed using SPSS ver.19 software. For qualitative data analysis we used Chi-square parameter and for quantitative - Student's t-test. Nonparametric Mann-Whitney parameter was used for data comparisons. Along with that we performed logistic regression analysis to identify independent factors leading to a different outcome. For verification of statistical hypotheses, the significance level of ( $p < 0.05$ ) was chosen.

## Results

The study included 219 dermatovenerological patients with psoriasis from Kaunas Clinical Hospital: 71 women (32 percent) and 148 men (68 percent). Their average of age was - 41.2 years (from 18 to 79 years). PASI scores mean in the beginning of the treatment was 24.1 (from 1.5 to 85.0; with a 95% CI 18.9 to 23.2). The average of PASI score change during the treatment for patients with psoriasis and diabetes mellitus was 9.42 (from 0.5 to 14.80 scores ; with a 95% CI 5.04 to 11.09), for the patients without diabetes mellitus was 8.11 (from 0 to 45.50 scores; with a 95% CI 9.22 to 9.33). PASI scores were compared statistically and the difference was not significant among the patients with or without diabetes mellitus ( $p = 0.852$ ). The average of PASI score change during the treatment for patients with psoriasis and hypertension was 9.65 (from 0,5 to 26,70 scores ; with a 95% CI 6,21 to 11,18), for the patients without hypertension was 9.38 (0 to 45.50 scores ; 95% CI 7.13 to 9.64). PASI scores were compared statistically and the difference was not significant among the patients with or without hypertension ( $p = 0.573$ ). The average of PASI score change during the treatment for patients with psoriasis and coronary heart disease was 9.87 (2.70 to 13.70 ; 95% CI 8.04 to 9.21). The average of PASI score change during the treatment for patients with psoriasis and metabolic syndrome was 8.45 (2.70 to 15.79 scores ; 95% CI 6.12 to 9.50). The patients with a history of psoriasis who had coronary artery disease were 8.2 times more likely to have moderate to severe (PASI > 10) psoriasis form by statistically significant logistic regression data (9% CI 4.0 to 17.2;  $p < 0.05$ ). Analyzing different components of metabolic syndrome link to cardiovascular risk, we found that increasing the number of components of the metabolic syndrome increases cardiovascular risk. We found that each of these components may be affected by the emergence of another component that has a direct impact on the course of treatment for related diseases (age 95% CI 2.0 to 18.1,  $p < 0.05$ ; smoking 95% CI 1.0 to 0.2,  $p < 0.05$ ; metabolic syndrome 95% CI 5.0 to 16.2,  $p < 0.05$ ). We evaluated several symptoms associated with coronary artery disease (age, smoking and metabolic syndrome) and by the logistic regression analysis in a group of men most closely associated with the probability of coronary artery disease were a metabolic syndrome and age, in a group of women - age. In both groups smoking was not significantly associated with the probability of coronary artery disease.

## Conclusions

1. It was found that each component of the metabolic syndrome can affect the appearance of the other component, which has a direct impact on the course of treatment of psoriasis.

2. It was found that the change of PASI during the psoriasis treatment in patients with diabetes mellitus was higher, therefore psoriasis course is statistically more severe.
3. It was found that patients with ischemic heart disease were 14.9 times more likely to experience a more severe form of psoriasis than a patients with metabolic syndrome.

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## DIAGNOSTIC VALUE OF RADIOLOGICAL METHODS IN HEPATOCELLULAR CARCINOMA DIAGNOSTICS

*Antanas Montvila, Aistė Matulevičiūtė*

*Supervisor of the abstract: Kristina Žvinienė*

*Lithuanian University of Health Sciences. Department of Radiology, Lithuania*

### Introduction

Hepatocellular carcinoma (HCC) – is the most frequent primitive liver neoplasm and the sixth most common cancer in the world (1,2). The number of HCC is still increasing, early and accurate detection of HCC lesion and differential diagnosis from other focal liver lesions is essential for patients' lifetime so it is important to evaluate radiological features and improvement of radiological HCC diagnostics (3).

### Aim

To evaluate the importance of radiological investigation in HCC diagnostics and ascertain the correlation between serum alpha - fetoprotein (AFP) level and radiological findings.

### Objectives

1. To evaluate the typical radiological findings of HCC.
2. To ascertain the correlation between the serum AFP level and the size of the liver lesion.
3. To evaluate the diagnostic accuracy of radiological methods in identifying HCC.
4. To compare the results of this study with earlier studies performed in Lithuania.

### Methods

A retrospective study of 57 patients with suspected diagnosis of HCC in LSMU clinics during 2009 – 2014 years was performed. Serum AFP level (kU/l), results of conventional ultrasound (US), triple-phase CT (CT) and magnetic resonance imaging (MRI) were evaluated trying to verify radiological manifestation of HCC. Liver lesion needle biopsy and histological verification was performed to all of the patients. We have evaluated the sensitivity, specificity, positive and negative predictive values of both US and CT using contingency table. The results of this study were compared with the previous studies trying to evaluate the improvement of radiological diagnostics of HCC in

Lithuania. SPSS 21.0 was used for statistical analysis. Non - parametric statistic methods were used for calculations (Spearman's correlation). Data were considered statistically significant if value  $p < 0.05$ . ROC curve was used to compare sensitivity and specificity of different methods of radiological diagnostics.

## Results

Cases of 57 patients (46 (80,7%) men and 11 (19,3%) women; age range 12 - 88 years; mean  $\pm$  SD;  $62,9 \pm 15,15$  years) were examined. One focal liver lesion was found in 33 (57,9%), 2 in 6 (10,5%), > 3 in 18 (31,6%) cases. The liver lesions were divided by the size: < 2,5 cm – 8 (14%), 2,5 – 5 cm – 19 (33,3%), > 5cm – 30 (52,6%) cases. US examination showed 37 (64,9%) hypo-, 11 (19,3%) iso- and 9 (15,8%) hyperechoic nodules. In arterial phase of CT 17 (29,8%) hypo-, 1 (1,8%) iso- and 39 (68,4%) hyperdense lesions; in portal venous phase – 49 (86%) hypo-, 5 (8,8%) iso- and 3 (5,2%) hyperdense lesions; in venous phase – 50 (87,7%) hypo-, 4 (7%) iso-, 3 (5,3%) hyperdense lesions were observed. The serum AFP level was divided into groups: < 5 kU/l – 15 (26,3%), 5 – 50 kU/l – 13 (22,8%), 50 – 1000 kU/l – 16 (28,1%), >1000 kU/l – 13 (22,8%) cases. Liver lesions included 52 (91,23%) HCCs and 5 (8,77%) metastases. Of the 18 MRI cases, 17 (94,4%) lesions were hyper- and 1 (5,6%) hypointense. HCC was suspected for 17 (94,4%) patients. For 16 (94,12%) cases diagnosis was proven histologically and 1 (5,88%) case was proven as non-HCC. There was 1 (5,56%) false positive case. Moderate positive correlation between the liver lesion size and the serum AFP level was observed (Spearman correlation  $r = 0,499$ ,  $p = 0,0001$ ). The sensitivity and specificity were 90,38% and 60% for US and 90,91%, 80% for CT respectively. Positive and negative predictive values were 95,92%, 37,5% for US and 98%, 66,67% for CT respectively. When comparing the ROC curves, we found a higher area under curve for CT (0,577; CI 0,343-0,811) then for US (0,558; CI 0,316-0,800). In earlier studies: (2003-2007) sensitivity and specificity were 42,9%, 53,8% for US and 69,4%, 66,7% for CT; (2006-2009) 76%, 40% for US and 84%, 60% for CT respectively.

## Conclusions

1. HCC is mostly shown as hyperechoic lesion in US, hyperdense lesion in CT and hyperintense lesion in MRI (hyperenhancement in the arterial phase is followed by washout in the portal and late phases).
2. There is a moderate correlation between the size of the liver lesion and the serum AFP level.
3. The sensitivity of US and CT is similar in HCC diagnostics. CT is more specific imaging method than US in HCC diagnostics.
4. The radiological HCC diagnostics has improved during past 12 years.

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## EMERGENCY ENDOSCOPY FOR UPPER GI BLEEDING: ONE YEAR OVERVIEW IN KAUNAS CLINICS OF LSMU

*Vytenis Petkevičius, Povilas Budrys*

*Supervisor of the abstract: Juozas Kupčinskas*

*Department of Gastroenterology, LSMU, Lithuania*

### Introduction

Bleeding from the upper gastrointestinal (GI) tract is a common pathology, which requires urgent treatment. Recent studies have shown that incidence of upper GI bleeding varies from 48 to 160 cases for 100000 individuals. Esophagogastroduodenoscopy (EGD) is an effective approach to diagnose and treat patients, who are bleeding from the upper GI. There are different endoscopic techniques used to control bleeding, however the choice of the method and its efficacy varies in different medical centers.

## **Aim**

The aim of our study was to identify the causes of upper GI tract bleeding, endoscopic treatment modalities and their efficacy among the patients who underwent emergency EGDs in the Department of Gastroenterology at Kaunas Clinics of Lithuanian University of Health Sciences between March 1st 2014 and March 1st 2015.

## **Objectives**

1. Identify most common causes of upper GI bleeding and evaluate hemostatic treatment modalities.
2. Compare treatment options between peptic and variceal bleeding.
3. Assess recurrent bleeding rate after primary endoscopic hemostasis and identify factors associated with re-bleeding.

## **Methods**

Consecutive 558 patients with clinically suspected upper GI bleeding, who underwent emergency EGD in Kaunas Clinics of Lithuanian University of Health Sciences between March 1st 2014 and March 1st 2015, were enrolled in the study. Analyzed parameters include: sex, age, active upper GI bleeding or evidence of former bleeding, gastric preparation before EGD, bleeding cause, modality of hemostatic treatment (adrenaline injection, sclerotherapy, Blakemore tube, argon plasma coagulation (APC), clips), re-bleeding. Bleeding gastric and duodenal ulcers were classified according to Forrest classification: IA - spurting hemorrhage, IB - oozing hemorrhage, IIA - visible vessel, IIB - adherent clot, IIC - flat pigmented haematin on ulcer base, III - lesions without signs of recent hemorrhage or fibrin-covered clean ulcer base. Statistical analysis was performed with IBM SPSS Statistics 22.0. Continuous variables were expressed as median (25th-75th percentiles). Mann-Whitney test was used to compare continuous variables between categorical data groups. Categorical variables were compared using a  $\chi^2$  test. A multivariate logistic regression analysis was performed to ascertain the effects of the variables (sex, age, bleeding cause, ulcer type according Forrest, hemostatis method) on the likelihood for the patients to develop repeated bleeding.

## **Results**

During one year period 558 EGDs were performed for the patients with suspected upper GI bleeding. 392 (70%) patients had upper GI bleeding signs during endoscopy: 25.8% had active bleeding, 44.2% had signs of former bleeding. Peptic bleeding was diagnosed for 242 (61.7%) patients, variceal – for 34 (8.7%), other causes – for 116 (29.6%). Adrenaline injection was used to treat 61.7% cases of peptic bleeding, but it was not applied for patients with variceal bleeding. The frequency of etoxisclerol usage was similar in both groups. Blakemore tube was inserted for 23.5% patients with variceal bleeding. Two method hemostasis was more often used to stop peptic bleeding than variceal: 52.3% vs 20%,  $p < 0.01$ . Re-bleeding rate did not significantly differ across two groups: 12.1% and 6.7%. When bleeding from ulcers, the hemostasis method was associated with the type of ulcer: IA, IB and IIA types were more often treated by two hemostasis methods than IIB, IIC and III: 66% vs 23.9%,  $p < 0.01$ . Recurrent bleeding was diagnosed for 23 (10%) patients. Re-bleeding rate did not significantly differ between patients who were treated by one and two methods: 7.8% and 11.5%. Multivariate logistic regression analysis showed that Forrest II type compared with I type (OR 13.2, 95% CI (1.67-101.5),  $p < 0.05$ ) was associated with an increased likelihood of re-bleeding. Bleeding cause, age, sex, hemostasis method was not associated with an increased likelihood of re-bleeding.

## **Conclusions**

1. The most common upper GI bleeding cause was gastric or duodenal ulcers. Endoscopic hemostasis was performed for more than half patients, mostly with adrenaline and sclerotherapy.
2. The hemostasis method of choice for peptic bleeding was adrenaline injection, for variceal bleeding – etoxisclerol injection or Blakemore tube insertion. Two method hemostasis was more often applied for patients with peptic bleeding than with variceal bleeding.
3. Recurrent bleeding was diagnosed for 10% of patients, independently from used hemostasis method. Forrest II type ulcers were associated with the increased likelihood of having re-bleeding.

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## FUNCTIONAL CHANGES OF LUNG RESULTS IN YOUNG PEOPLE WITH ASTHMA, WHICH ARE CAUSED BY NORDIC WALKING

*Vytautas Ankudavičius, Rūta Kerytė*

*Supervisor of the abstract: Raimondas Savickas, Joana Kriščiokaitytė*

*Department of Rehabilitation, LSMU, Lithuania*

### Introduction

The World Health Organization states that asthma treatment expenses for people worldwide surpass those of AIDS and tuberculosis combined [1]. Asthma negatively influences: professional activity, social life, self-care, resting time and economic independence. World Health Organization (WHO) highly recommends regular physical activities, especially for people suffering from asthma [2]. In 1997 new form of physical activity had appeared – Nordic walking, whose purpose was to neutralize the risks of sedentary lifestyle and decrease a spread of chronic diseases. In general, physical exercises are adapted by solving all four goals of medicine: treatment, rehabilitation, disease prevention and health strengthening. Activities that take place outside positively affect a person's mood, decreases stress levels and improves health [3].

### Aim

To determine and examine Nordic walking's influence on functional results of lungs, physical health and emotions amongst young people with asthma.

### Objectives

1. To measure and compare the results of lung ventilation before and after Nordic walking.
2. To determine the influence of Nordic walking on respiratory system function and cardiovascular results.
3. To examine overall physical health and activity of students suffering from asthma.
4. To identify and estimate the connection between the physical activities of observed participants, the symptoms of asthma and emotions, related to this particular disease.
5. To examine correlation between physical activity and functional results of respiratory samples.

### Methods

The research was conducted in 2013 – 2014 and took place in the Hospital of Lithuanian University of Health Sciences (LSMU) Kaunas Clinics, Department of Rehabilitation. 214 LSMU students with asthma participated in the test. 110 students were assigned to the experimental group and 104 students – to the control group. Experimental group's diseases progressed from low to medium; medical term – remission; form of disease – exogenous, endogenous and hybrid. Two lung ventilation measurements were performed – before starting the Nordic walking cycle and after its completion. The results of lung ventilation of experimental group that were measured and compared: Forced vital capacity(FVC), Forced expiratory volume in 1 second (FEV1), Tiffeneau index (FEV1/FVC), Peak expiratory flow(PEF). Cardiovascular system's rate was measured at rest and after physical activity. Statistical data analysis was performed by IBM SPSS 20.0 version statistical package. The normal distribution of each variable was assessed using the Kolmogorov-Smirnov test. Means, standard deviation, frequencies and other descriptive statistics were counted. Data were considered statistically significant if value  $p < 0,05$ .

## Results

Number of students that participated - 214. Average age of students  $22,11 \pm 0,17$  years old. Distribution of asthma symptoms: shortness of breath 25,20%, coughing 28,20, 5,8% coughing up phlegm, difficulty exhaling 33,70%, chest heaviness 7,1%. PEF after the Nordic walking cycle showed better results only for students from experimental group ( $312,21 \pm 58,22$  – before and after -  $355,33 \pm 11,23$ ). FEV1 before the first cycle of Nordic walking: in experimental group  $91,13 \pm 17,13\%$  and  $89,01 \pm 7,22\%$  in control group; after first Nordic walking cycle: in experimental group  $97,88 \pm 11,32\%$ , in control group -  $95,21 \pm 6,76\%$ . Heart beat rate arithmetic mean before was  $89,11 \pm 2,55$  bpm and after Nordic walking cycle –  $83,11 \pm 2,68$  bpm. Before Nordic walking average PEmax was  $76,16 \pm 3,11$  cmH<sub>2</sub>O; PEmax after the exercise -  $81,11 \pm 1,22$  cmH<sub>2</sub>O. In the experimental group before the walking FVC was  $2,88 \pm 0,09$  l; FVC after it –  $3,15 \pm 0,43$  l. In the control group FVC before Nordic walking cycle was  $2,96 \pm 0,09$  l and after - FVC  $2,99 \pm 0,01$  l. sABP in the experimental groups before Nordic walking was  $125,55 \pm 12,56$  mmHg, and after the cycle:  $113,65 \pm 10,57$  mmHg. Medium intensity correlation was determined between physical activity and asthma symptoms ( $r = 0,580$ ,  $p < 0,007$ ), emotions ( $r = 0,500$ ,  $p < 0,02$ ), between physical activity and emotions; Medium intensity correlation was detected between physical activity and peak expiratory flow rate (PEF) values ( $r = 0,512$ ,  $p < 0,003$ ).

## Conclusions

1. The analysis of ventilation parameters revealed that volume exhaled at the end of the first second of forced expiration (FEV1), the value of the vital capacity from a maximally forced expiratory effort (FVC), forced expiratory ratio (FEV1/FVC) and peak expiratory flow (PEF) after the Nordic walking cycle increased evidently ( $p < 0,05$ ) in the experimental group.
2. We determined that after Nordic walking cycle students from the experimental group showed positive changes in respiratory and cardiovascular function: the value of the vital capacity from a maximally forced expiratory effort increased by 190ml and parameters of the cardiovascular system decreased (systolic by 14,08 mmHg and diastolic - 8,15 mmHg).
3. It was determined that overall physical activity of everyone from the experimental group is average low (total value of evaluation for girls is 56,1% and for boys – 89,7%). It was perceived that participants in the experimental group do not tend to be physically active during leisure time, therefore the rate of physical activity has a tendency to decrease.
4. Medium intensity correlation was verified between physical activity and asthma symptoms, emotions, and between physical activity and emotions.
5. Medium intensity correlation was determined between physical activity and peak expiratory flow(PEF) rate values.

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## GASTROESOPHAGEAL REFLUX DISEASE AMONG MEDICAL STUDENTS IN LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

*Rolandas Gedgaudas, Eglė Bikauskaitė*

*Supervisor of the abstract: Laimas Jonaitis*

*Department of Gastroenterology, LSMU, Lithuania*

### Introduction

Gastroesophageal reflux disease (GERD) is a common disorder. The disease affects the patients' quality of life, reduces their functional activity, increases economic burden. Although the prevalence of GERD is established in the general population in European countries, there are no data on its prevalence in medical students.

## **Aim**

To determine GERD prevalence among medical students in Lithuanian University of Health Sciences.

## **Objectives**

- 1) To determine the most common GERD symptoms among medical students.
- 2) To determine the prevalence of GERD/highly possible GERD diagnosis among medical students.
- 3) Compare demographic and clinical characteristics of students with GERD and without GERD.
- 4) Assess frequency of anti-reflux medication usage among medical students.
- 5) Identify risk factors among students with GERD

## **Methods**

A prospective study was held at the Lithuanian University of Sciences between February and March 2015. A total amount of 511 anonymous questionnaires, containing four sections: 1) demographic questions: gender, age, year of medical school 2) GERD questionnaire 3) Questions about GERD diagnosis and treatment 4) Risk factors of GERD: body mass index (BMI), smoking, consumption of coffee, alcohol, NSAID, were distributed. Of these, 384 questionnaires were returned, for a response rate of 75,1%. 365 subjects completed the Lithuanian version Gastroesophageal reflux disease questionnaire(GerdQ). GerdQ is a 6-item, questionnaire, developed as a practical and inexpensive diagnostic tool for GERD. Score of  $\geq 8$  diagnosed GERD with a sensitivity and specificity of 64.6% and 71.4%. Questionnaire assessed frequency of heartburn and regurgitation during the previous week, sleeping disorders, a need of anti-reflux drugs because of these symptoms. Depending on how often these negative symptoms occurred, each of these questions were given a score of 0 to 3. A maximum score of GerdQ is 18. Students having GerdQ score of  $\geq 8$  and students with previous GERD diagnosis were considered as GERD-positive group. Statistical analysis was performed by using IBM SPSS Statistics 20 program. Non-parametric tests were used to evaluate dependence between groups (Mann-Whitney U test, Spearman correlation), Logistic regression was used to obtain odd ratios.

## **Results**

Data of 112 (30.7%) men and 253 (69.3%) women were analyzed. Mean age was  $22.0 \pm 1.9$  years. 36 (9.9%) had been clinically diagnosed with GERD before. Of all, 105(28.8%) students had heartburn, 121(33.2%) had acid-regurgitation. 36(9.9%) had disturbance of sleep, 31(8.5%) had a need of additional medication because of GERD symptoms, once or more per week. Dyspeptic symptoms occurred as follows: 118(32.3%) had pain in the upper stomach, 106(29%) had nausea at least once a week. According to previous diagnosis and present GerdQ score  $>8$ , the GERD-positive group consisted of 79 (21.6%) persons. GERD-positive students were older  $22.84 \pm 1.69$  vs.  $21.80 \pm 1.93$  year ( $p < 0.01$ ) than GERD-negatives, consumed more alcohol units  $3.56 \pm 4.54$  vs.  $2.22 \pm 3.64$  ( $p = 0.01$ ). Groups did not differ in number of smokers BMI, and consumption of NSAIDs and coffee. 68 (18.6%) students use antacid drugs to relieve GERD symptoms. Among them, 62(91.2%) use medication when symptoms occur, 6 (8.8%) use these drugs constantly. 41 (51.9%) students in GERD positive group use anti-reflux medication vs. 27 (9.4%) in GERD negative ( $p < 0.01$ ). Age – (Odds ratio (OR) - 1.31 95% CI (1,13-1,53),  $p < 0,01$ ) coffee – (OR– 1.71 95% CI (1.04 – 2,62),  $p = 0.04$ ) and alcohol consumption (OR – 1,11 95% CI (1,05 – 1,21),  $p = 0.04$ ) increased possibility of being GERD-positive. Smoking, NSAIDs usage and BMI  $> 25$  did not statistically increase possibility of being GERD-positive ( $p > 0.05$ ).

## **Conclusions**

1. Acid-regurgitation and heartburn are the most common symptoms among medicine students.
2. According to our criteria 21.6% of students are GERD positive - can be considered as having Gastroesophageal reflux disease.
3. GERD-positive students were older and consumed more alcohol units.
4. 18.6% students use antacid drugs to relieve GERD symptoms.
5. Age, consumption of coffee and alcohol were the risk factors of being GERD-positive.

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## GASTROINTESTINAL SYMPTOMS IN PATIENTS WITH END-STAGE RENAL DISEASE ON HEMODIALYSIS

*Lina Kievišienė, Aušra Marija Obelenytė*

*Supervisor of the abstract: Edita Žiginskienė*

*Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Department of Nephrology, Lithuania*

### Introduction

Gastrointestinal (GI) disorders are common in patients with end-stage renal disease (ESRD), including those receiving renal replacement therapy (RRT). The most common GI symptoms are heartburn, constipation, diarrhea and dyspepsia. GI symptoms can result from uremia, the effects of RRT, underlying disease or drugs required for treatment. GI disorders may lead to an increased frequency of both upper and lower gastrointestinal diseases, reduced food intake, resulting in malnutrition, impaired well-being. Currently there are no clear recommendations on management of the GI disorders in ESRD patients undergoing hemodialysis (HD). Although the link between ESRD and GI disorders is widely known, it remains poorly investigated.

### Aim

To investigate the occurrence of GI symptoms in patients with ESRD undergoing HD and to explore the relationship between these symptoms and factors related to ESRD and its treatment.

### Objectives

1. To evaluate the prevalence of GI symptoms in ESRD patients undergoing HD.
2. To analyze the relationship between GI symptoms and demographic, dialysis-related and laboratory tests data as well as doses of drugs used for treatment of ESRD complications.
3. To determine the prevalence of patients on HD consulting physicians about management of GI disorders and the main specialist they rely on.

### Methods

Forty-four ESRD patients (pts) undergoing HD in Lithuanian University of Health Sciences (LSMU) hospital Kaunas Clinics Nephrology Clinic participated in the study. GI symptoms were assessed using the interview-based Gastrointestinal Symptom Rating Scale (GSRS) questionnaire, which contains 15 items, each rated on a 7-point Likert scale from no symptoms (1) to very troublesome symptoms (7). Patients rated the severity of symptoms over the past three weeks. The GSRS items were divided in five domains: abdominal pain, reflux, indigestion, diarrhea and constipation. From individual items within a domain a mean score was calculated. Information concerning patient age, sex, dialysis adequacy assessment (Kt/V), hemoglobin (Hb), ferritin, parathyroid hormone (PTH), albumin, treatment with erythropoiesis stimulating agents (ESAs), intravenous (IV) iron, phosphate binders and alfacalcidol was obtained from medical records.

Statistical analysis was performed using SPSS 22.0 software package. Normality of distribution was tested by the Shapiro-Wilk test. Categorical variables were compared using Chi-square and continuous variables using the Student's

t-test. Quantitative data were expressed as mean with standard deviation or median. Correlation analysis were done using Spearman test (rs). Moderate correlation was considered when rs was 0.40-0.59. P-value of The Ethics committee of Hospital of LSMU approved this study (approval No. BEC-MF-660).

## Results

44 ESRD pts undergoing HD participated in the study: 24 men and 20 women. The mean age was 62.6 (14.6) years. The median duration of HD was 32 months. The most common causes of ESRD were hypertensive nephropathy and chronic pyelonephritis (each 22.7%) followed by chronic glomerulonephritis (20.5%). 91% of pts received ESAs, 86% IV iron, 64% osvaren and 32% alfacalcidol.

70.5% of pts reported at least one GI symptom (GSRS>1). When considering GSRS symptoms across five domains, 43.2% of pts had indigestion symptoms, 34.1% reflux, 31.8% constipation, 29.5% abdominal pain and 27.3% diarrhea. The mean GSRS total score was 1.5 (0.5), scores for reflux were 1.7 (1.2), for constipation 1.6 (1), for indigestion 1.5 (0.7), for diarrhea 1.4 (0.7) and for abdominal pain 1.3 (0.6).

There were no significant relationship between the GSRS scores and age, sex, duration of HD, Kt/V, concentration of Hb, ferritin, PTH, albumin or dose of IV iron and osvaren ( $P > 0.05$ ). We found statistically significant moderate direct correlation between both GSRS constipation and diarrhea scores and ESA dose units/kg/week ( $r_s = 0.52$ ,  $P < 0.001$ ;  $r_s = 0.40$ ,  $P = 0.01$ , respectively). There were statistically significant moderate direct correlation between GSRS diarrhea score and alfacalcidol dose  $\mu\text{g}/\text{week}$  ( $r_s = 0.57$ ,  $P = 0.03$ ).

59% of pts did not consult any doctor about GI symptoms. They had lower GSRS total score in comparison with those who consulted (1.3 vs 1.7,  $P < 0.044$ ) and relied mainly on nephrologists (83%).

## Conclusions

1. The majority of hemodialyzed patients (70.5%) had at least one GI symptom. Almost half of patients had indigestion symptoms, about one-third reported reflux, constipation, abdominal pain and about one-fourth had diarrhea symptoms.
2. There were no significant relationship between the GSRS scores and age, sex, dialysis-related or laboratory tests data. However, the dosage of medications used for ESRD complications treatment (ESA and alfacalcidol) correlated directly with GI symptoms, especially with those related to diarrhea and constipation syndromes.
3. More than half of patients did not consult any physician about GI disorders, as their symptoms were mild. The majority of patients with more troublesome GI symptoms relied mainly on nephrologists.

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# INCIDENCE OF VACCINATION AGAINST INFLUENZA AND RATE OF UPPER RESPIRATORY TRACT INFECTIONS MORBIDITY AMONG LITHUANIAN UNIVERSITY OF HEALTH SCIENCES MEDICINE FACULTY MEDICINE ACADEMY STUDENTS

*Eglė Vilija Misiūnaitė, Valentina Kopūstaitė*

*Supervisor of the abstract: Ilona Stirbienė*

*Lithuanian University of Health and Science, Medicine Academy, Medicine Faculty, Lithuania*

## **Introduction**

In Lithuania there is a widespread view that vaccination against influenza is not necessary. However, people in Lithuania are at high risk to get an upper respiratory tract infection due to the cold season. Especially medical students from 4-6 courses. They have close contact with patients in hospitals and can be infected or transfer the infection to them. Both ways the outcome is undesirable. We decided to determine the morbidity of upper respiratory tract infection and rate the immunization against influenza among students.

## **Aim**

To evaluate the rate of vaccination against influenza among Lithuanian's University of Health and Science, Medicine Academy, Medicine Faculty, students (LSMU MA MF) from 4 to 5 courses and the impact of the vaccine on upper respiratory tract infections (URTI).

## **Objectives**

1. To determine the rate of vaccination against influenza among LSMU MA MF students' from 4-5 courses.
2. To compare morbidity of URTI between vaccinated and non-vaccinated students.
3. To compare the development of complications between vaccinated and non-vaccinated students after URTI.
4. To set the influence of lifestyle on URTI morbidity.

## **Methods**

An internet survey of LSMU MA MF medical students from 4 to 5 courses was carried out. People had to answer anonymously to 12 questions of the created questionnaire. The sample size was 388 students. Two groups were concluded: respondents with URTI - 221 (57.3%) and respondents with no history of URTI- 167 (42.7%). Also we distinguished one major group of non-vaccinated students - 367 (94.5%) and one minor group of vaccinated students – 21 (5.5%) Vaccinations and sickness rates were evaluated in 2014 -09 -01 - 2015-02-28 period. Aspects that were assessed: vaccination rate, morbidity of URTI, development of complications after URTI (students expressed their condition after their illness in the internet survey), lifestyle influence (smoking, physical activity, fruit and vegetable consumption, hand hygiene) on URTI morbidity. All gathered data was estimated by using „SPSS“and „Excel“programs.

## **Results**

388 LSMU MA MF 4-5 courses, students were interviewed: 21 of them had a vaccination (5.5%) and 367 (94.5%) did not. In comparison, vaccinated and non-vaccinated students, upper respiratory tract infection (URTI) morbidity rate was: 11 (52.4%) were vaccinated and 211 (57.4%) were not vaccinated. After statistical comparison of data about development of complications after URTI among vaccinated and non-vaccinated was: complications developed in 37 (17.5%) students from non-vaccinated group and in 1 (9%) student from the vaccine covered group. P = 0.639 11 (4.9%) students after URTI had pneumonia (1 of 11 was vaccinated), 10 (4.5%) had otitis, 17 (7.7%) indicated other late complications (sinusitis, bronchitis, urinary inflammation of the gallbladder, etc.). Lifestyle influence on URTI. 61 (27.6%) respondents which had URTI, live with their parents, 47 (21.3%) live with friend, 44 (19.9%) live in a dormitory, 40 (18.1%) live alone, 29 (13.12%) indicated a different living environment (p = 0,639; so it shows that living environment has no statistical significance on URTI development). Total number of smokers are 50 (13.6%) respondents, 30 (60% p = 0,392; so it shows that smoking has no statistical significance on URTI development) of them

had morbidity of URTI. 118 (30.7%) respondents claim that they spend 2 hours per week doing physical activity, 62 (52.1%) of them had URTI; 157 (40.9%) claim that they spend from 3 to 5 hours per week doing physical activity and 88 (55.7%) had an URTI; 67 (17.4%) respondents maintain spending active 5-7 hours per week, 42 (62.7%) had URTI; 42 (10.9%) students spent more than 8 hours per week active, 29 (67.4%;  $p = 0.296$ .) of them got sick. 277 (71.4%) respondents said that fruits and vegetables they consumed 1-2 times per day, 170 (61.8%  $p = 0.041$ ) of them had URTI; 89 (22.9%) consumed 3-4 times per day fruits and vegetables, 34 (38.1%  $p = 0,042$ ) of the group became ill; 21 (5.4%) students stated that they not consumed fruits and vegetables, 12 (57.1%  $p = 0.039$ ) of them got URTI. Statistically significant 50 (13%) washed hands 1-3 times a day, 14 (28%) became ill URTI; 135 (34.9%) were washing their hands 3-6 times per day, 77 (57.03%) got URTI, 202 (52,1%) respondents said that they are washing hands more than 6 times per day and 130 (64,36%  $p = 0,269$ ) of them got URTI.

### Conclusions

1. Vaccinated LSMU MA MF students from 4-5 courses are the minority - 5,5%.
2. Because of the very low quantity of vaccinated students we were not able to find a statistically significant effect on URTI morbidity among students.
3. Because of the very low quantity of vaccinated students we were not able to find a statistically significant effect on the development of late complications among students.
4. According to data on lifestyle influence on URTI morbidity we had determined that: students who are living with their parents tend to get URTI more often rather than students who are living with friend, in dormitory or alone. Also, the smokers tend to get URTI twice as likely to non-smokers. In addition to students who ate fruits and vegetables 3-4 times per day were healthier rather than students who ate fruits and vegetables less times per day. However, students who washed their hands more than 6 times one and a half times more likely tend to get URTI rather than students who washed their hands less than 6 times per day.

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# INVESTIGATION OF KIDNEY FUNCTION AND OVERALL HEALTH OF LIVING KIDNEY DONORS IN VILNIUS UNIVERSITY SANTARIŠKIŲ KLINIKOS

*Eglė Dieninytė*

*Supervisor of the abstract: Loreta Vareikienė*

*Vilnius University, Lithuania*

## **Introduction**

Renal transplantation is the first order treatment for the end stage renal disease (ESRD), showing better survival rates and improved life quality in comparison to dialysis. However, due to the shortage of kidney transplants, the waiting period is prolonged and risks of dialysis are increased. Since 1954, living kidney donation has been showing promising results in transplant survival time, complications rate, etc. as well as allowing for pre-emptive transplantation, thus avoiding dialysis. Therefore, to encourage the society for living kidney donation there is an evident need of studies regarding donors to provide scientific evidence of its safety to health.

## **Aim**

The aim of this research was to investigate renal function and health, attitude towards donation after nephrectomy of living kidney donors, who have donated their kidneys to relatives during the period of 2002 and 2014 in Vilnius University Santariškių Klinikos.

## **Objectives**

Considering renal function, the objectives were to investigate creatinine levels in serum, proteinuria and estimated GFR. In addition, the research aimed at analyzing hypertension onset rate in kidney donors. For the purpose of health evaluation, scores of a standardized SF-36 were examined and overall attitude towards living kidney donation assessed using a questionnaire.

## **Methods**

The research consisted of retrospective analysis of laboratory tests results of living kidney donors, who donated their kidneys during the period between 2002 and 2014, as well as asking the donors to schedule a follow-up with transplant team nephrologist. During the follow-up, blood and urine samples were collected for the laboratory analyses, donors' blood pressure measured and enquiries about possible onset of hypertension made. Moreover, the donors were asked to answer SF-36 and a non-standard questionnaire about their outlook on donation. The data was grouped into four groups in terms of the time periods following the donation (1-3, 4-6, 7-9 and 10-12 years after donation). GFR was estimated using CKD-EPI formula. The collected data was analyzed with Microsoft Excel and SPSS 22.

## **Results**

There were 61 donors in a group tested after 1 to 3 years after the donation. The mean age of donors was  $53,6 \pm 10,2$  years. Average creatinine concentration in serum was  $98,1 \mu\text{mol/l}$ . The mean eGFR was  $65,9 \pm 16,9 \text{ ml/min/1,73m}^2$  and it decreased by 26% in comparison to pre-nephrectomy level. 38% of donors in this group had CKD (eGFR < 60 ml/min/1,73m<sup>2</sup>) and 19% of donors had proteins detected in their urine sample. In a group tested 4 to 6 years after the nephrectomy, there was a total number of 26 donors. The mean age of donors was  $55,9 \pm 10,2$  years. Average creatinine concentration was  $94,9 \mu\text{mol/l}$  and eGFR was  $68,5 \pm 17,6 \text{ ml/min/1,73m}^2$  with a decrease of 23% in comparison to the pre-nephrectomy level. 31% of donors had CKD and 28% had proteins in urine sample detected. In a group tested 7 to 9 years after the nephrectomy, 14 donors were identified with a mean age of  $61,1 \pm 7,1$  years. Mean creatinine concentration was  $91 \pm 13,1 \mu\text{mol/l}$  and an average eGFR was  $66,9 \pm 11,6 \text{ ml/min/1,73m}^2$  with a decrease of 17% when comparing to pre-donation level. 21% of donors had CKD and none of them had proteins in their urine sample detected. Considering group, tested after 10 to 12 years following the donation, 11 donors were identified with the mean age of  $65,5 \pm 9,6$  years. Average creatinine concentration in this group was  $95,9 \pm 15 \mu\text{mol/l}$ .

The mean eGFR was  $60,5 \pm 15,4$  ml/min/1,73m<sup>2</sup> and it declined by 25% than pre-nephrectomy eGFR. 66% of donors had CKD and there was no proteinuria detected. A total of 55 donors came for a follow-up. 20% of them had hypertension with an onset after nephrectomy; however, there was no significant age difference between hypertensive and normotensive groups of donors ( $62,6 \pm 8,8$  vs  $56,3 \pm 11,4$ ;  $P = 0,098$ ). SF-36 survey scores showed no significant difference compared to average German population in donors' physical and mental health (PCS  $51 \pm 7,5$  vs  $49,3 \pm 0,1$ ;  $P = 0,94$  and MCS  $51,3 \pm 9,6$  vs  $50,7 \pm 0,1$ ;  $P = 0,67$ ). 93% of donors felt moral satisfaction about donating their kidney, 91% had no subjective decline in health and 100% of donors would encourage others to donate.

### Conclusions

The research revealed no significant difference in physical and mental health between living kidney donors and average population, as well as no end stage renal disease occurrence. However, the rate of CKD, proteinuria and hypertension during the post-donation period calls for a vigorous monitoring of living kidney donors.

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## LIVER FIBROSIS AND CIRRHOSIS PREDICTION BY NON-INVASIVE MARKERS

*Arnas Karužas, Simona Kasputytė*

*Supervisor of the abstract: Jolanta Šumskienė*

*Department of Gastroenterology, LSMU, Lithuania*

### Introduction

Liver biopsy has traditionally been considered the gold standard for the evaluation of hepatic fibrosis and is used as a benchmark for initiating treatment [1,3]. Liver biopsy is an invasive procedure, with a risk of rare but potentially life-threatening complications and it is prone to sampling errors. These limitations have led to the development of non-invasive methods [1,2]. There are various serum based biomarkers in an algorithm model for estimation of liver fibrosis stage and to determine cirrhosis such as Bonacini score, Lok index, AP index, APRI, AAR index, Fibro Q, FIB4, GUCI index, and King score. The Bonacini score is one of the newest non-invasive marker which can be used to determine liver cirrhosis [4].

### Aim

To evaluate prognostic significance of non-invasive markers determining the liver fibrosis and cirrhosis.

### Objectives

1. To evaluate the Bonacini score, AP index, APRI, AAR index, Fibro Q, FIB4, Lok index, GUCI index, King score prognostic significance determining the liver cirrhosis.
2. To evaluate the correlation between non-invasive markers and stages of liver fibrosis and cirrhosis.
3. To evaluate which non-invasive marker has the highest prognostic significance determining the liver cirrhosis.

### Methods

A retrospective study was held at the Lithuanian University of Health Sciences Gastroenterology Clinic. The total number of patients was 203. Patients who had liver fibrosis or cirrhosis were 103 and other patients were as control group. Patients with chronic hepatitis C, alcoholic liver disease, non-alcoholic steatohepatitis, cholestatic liver disease, haemochromatosis were included in the study. Liver biopsy was performed for these patients and determined stages of liver fibrosis (F1-F4) according to METAVIR. Analyzed data: age, platelets count, AST, ALT, INR, prothrombin. Non-invasive scores: Bonacini score, AP (Age-Platelet) index, APRI (AST to Platelet Ratio Index), AAR index, Fibro Q, FIB4, Lok index, GUCI (Göteborg University Cirrhosis index), King score were calculated by this data. Statistical analysis was

performed using IBM SPSS Statistics 22 software package. The Kruskal-Wallis analysis of variance was used to compare non-invasive parameters among the different fibrosis stages. The Bonacini and other scores as cirrhosis diagnostic indicators were assessed using ROC curves. Associated with any cut off value was the probability of a true positive (sensitivity) and the probability of a true negative (specificity). The most commonly used index of accuracy is area under the ROC curve (AUROC), values close to 1.0 indicating high diagnostic accuracy. Spearman coefficients of correlation was used to evaluate the relationship between parameters. Differences were considered as statistically significant when the p value was less than 0,05.

## Results

A total of 203 patients were enrolled in research. 103 (50,7%) patients had severe fibrosis (F3) or cirrhosis (F4) and the 100 (49,3%) patients were as control group of research. Aetiologies of severe fibrosis/cirrhosis were: chronic hepatitis C (HCV)(n = 77), alcoholic liver disease (n = 3), non-alcoholic steatohepatitis (n = 9), haemochromatosis (n = 6), cholestatic liver disease (n = 8), unknown aetiology (n = 8). The Kruskal-Wallis analysis results were evaluated and found significantly high difference between Bonacini score in patients with liver cirrhosis and without ( $p < 0,001$ ). The diagnostic value of Bonacini and other scores for cirrhosis and different degrees of fibrosis were evaluated by ROC curves and logistic regression. Based on the Bonacini, Lok, FibroQ, FIB4 scores distribution according to fibrosis stage, cirrhosis and ROC curves, the best discriminant cut off levels were determined (positive predictive value of at least 90%). Cut off level of Bonacini score for cirrhosis was 6,5 (sens=78%, specif=84%, AUROC 0,961), of Lok score – 0,33 (sens=81,6%, specif=89%, AUROC 0,932), of FibroQ – 4,25 (sens=82,9%, specif=87,4%, AUROC 0,916), of FIB4 – 0,808 (sens=82,7%, specif=87,4%, AUROC 0,922). Bonacini, Lok, FibroQ, FIB4 scores had significantly high predictive value for liver cirrhosis ( $p < 0,001$ ). Bonacini, Lok, FibroQ, FIB4 parameters significantly ( $p < 0,001$ ) correlated with other scores as AP, APRI, King, GUCI index. AP index ( $r = 0,702$ ), APRI ( $r = 0,266$ ), King score ( $r = 0,293$ ), GUCI index ( $r = 0,41$ ) significantly ( $p < 0,001$ ) correlated with stages by METAVIR.

## Conclusions

1. Non-invasive scores - Bonacini, Lok, FibroQ, FIB4 - had statistically significant predictive value for liver cirrhosis.
2. Bonacini, Lok, FibroQ, FIB4 parameters significantly correlated with other scores: AP index, APRI, King score, GUCI index, also correlated with stages of METAVIR.
3. According to area under the ROC curve the strongest predictive value for liver cirrhosis had Bonacini score.

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# PREVALENCE OF NAIL PSORIASIS AND THE IMPACT ON PATIENT'S QUALITY OF LIFE DEPENDING ON CLINICAL COURSE AND SEVERITY OF DISEASE

*Dagnija Brusa*

*Supervisor of the abstract: Ingmārs Mikažāns*

*Riga Stradins University, Latvia*

## **Introduction**

Psoriasis is a chronic, patient daily activities disabling disease. Usually its appearance is a skin lesions, but approximately half of the patients also develop nail changes, which can cause visual defect and potentially lead to physical limitations and decrease the quality of life.

## **Aim**

To identify the frequency of nail psoriasis among all psoriatic patients and to investigate the impact of nail psoriasis on patient's quality of life.

## **Objectives**

To understand patient and environmental factors that increase the risk of nail psoriasis. To define the correlation between severity of psoriasis and frequency of nail damage, investigate the quality of life of psoriatic patients and whether it is associated with nail damage. To characterize patients which are more prone to the impact of disease on the quality of life.

## **Methods**

For the retrospective research 340 case records of psoriatic patients were selected to investigate the frequency of disease, characterize average psoriatic patient and clinical appearance of disease. The prospective research was performed by interview and examination of 22 psoriatic patients. Severity of skin psoriasis was determined using PASI index, nails were assessed by NAPS scale and DLQI questionnaire was given to patients in order to assess the quality of life. Data were statistically processed using IBM SPSS Statistics 20.0 software.

## **Results**

Research of clinical cases showed that 16,2% of patients have nail alteration, besides the nail psoriasis more often is seen in men compared with women- 65,5% vs 34,5%. In prospective research patients with nail psoriasis showed higher PASI scores compared with those who have only skin involvement ( $10,7 \pm 5,5$  vs  $8,7 \pm 5,4$ ). More severe skin involvement was also associated with gender- men had significantly higher PASI scores, compared with women ( $12,46$  vs  $6,91$ ;  $p = 0,012$ ). Positive correlation was seen between NAPS and PASI scores ( $R = 0,406$ ;  $p = 0,05$ )- it means that more severe nail damage develops in patients with less controlled skin alteration. DLQI scores were not higher in group of patients with nail psoriasis, but impact on quality of life correlates with higher PASI scores ( $R = 0,333$ ), although no statistically significant results were obtained. Women had higher DLQI scores compared with men ( $11,0$  vs  $7,27$ ).

## **Conclusions**

Prevalence of nail psoriasis obtained in the research is less than mentioned in scientific literature, which shows inadequate nail assessment of psoriatic patients. Impairment of quality of life is not strongly associated with nail alteration, but more depends on severity and area of involvement of psoriasis. Severe forms of psoriasis are associated with nail damage and higher NAPS scores, which means complex approach to therapy.

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## RADIOLOGICAL IMAGING ROLE IN DIAGNOSIS OF THE POST-LIVER TRANSPLANTATION COMPLICATIONS

*Benas Sakalauskas, Dovilė Budriūnaitė*

*Supervisor of the abstract: Kristina Žvinienė*

*Department of Radiology, LSMU, Lithuania*

### Introduction

Liver transplantation (LT) is widely accepted as an effective therapeutic modality for a variety of irreversible acute and chronic liver disease. The success of liver transplantation has increased steadily over the last two decades and has become routine with an excellent outcome in terms of both quality and length of survival [1]. Despite improved perioperative technique and better understanding of the course and prognosis of several liver disease, improved immunosuppressive therapy and more effective postoperative care, complications are common in the early and long term period and radiological imaging acts a very important role in diagnosis of post-liver transplantation complications [2].

### Aim

To evaluate post-transplantation complications incidence rate and radiological imaging diagnostic value.

### Objectives

1. To evaluate association of age and gender in patients with post-transplantation complications.
2. To evaluate the incidence rate of immediate and long-term complications after liver transplantation.
3. To determine sensitivity and specificity of different radiological imaging techniques identifying vascular and biliary tract complications of liver transplantation.

### Methods

The retrospective data analysis of 17 patients with post liver transplantation complications in Hospital of Lithuanian University of Health Sciences during year 2010-2014. Included complications: biliary (stenosis, bilioma, haemobilia, cholelithiasis), vascular (a. hepatica, v. portae, v. hepatica stenosis, thrombosis and rupture), parenchymal (abscess, recurrent hepatocellular carcinoma (HCC), rejection, hepatitis). "Golden Standard" (G.S.) – results of ERCP, surgery and histological examination. Immediate complications – occurred till 1 month after liver transplantation. Long-term

complications – occurred after 1 month after liver transplantation. Statistical analysis was performed using the statistical program SPSS 22.0. Student t-test and the chi-square test was used to determine the correlation. Selected statistical significance level  $p < 0,05$ .

## Results

Analyzed 17 patients, 12(70,6%) men and 5(29,4%) women. Diagnosed 27 post-liver transplantation complications. Among them, 18(66,7%) for men and 9(33,3%) for women,  $p > 0,05$ . The mean age among patients with complications were  $49,9 \pm 9,4$  years. Mean age among men was  $48,2 \pm 10,5$  years, among women  $53,5 \pm 5,6$  years,  $p > 0,05$ . There were 15(55,5%) immediate complications and 12(44,5%) long-term complications. The incidence of immediate complications: biliary stenosis 7(46,6%), graft rejection 3(20,0%), bilioma 1(6,7%), graft ischemia 1(6,7%), a. hepatica thrombosis 1(6,7%), a. hepatica stenosis 1(6,7%), a. hepatica rupture 1(6,7%),  $p > 0,05$ . Long-term complications: biliary stenosis 5(41,7%), recurrent HCC 2(16,7%), hepatitis 1(8,3%), bilioma 1(8,3%), haemobilia 1(8,3%), cholelithiasis 1(8,3%), abscess 1(8,3%),  $p > 0,05$ .

Ultrasound (US) was performed in 27 cases: for 7, biliary complications were suspected (G.S. confirmed – 6, G.S. unconfirmed – 1), for 20 cases biliary complications were not suspected (G.S. confirmed – 10, G.S. unconfirmed – 10). US sensitivity for biliary complications was 31,2%, and specificity 90,9%. Vascular complication was suspected for 1 (G.S. confirmed – 1, G.S. unconfirmed – 0), for 26, no vascular complications were suspected (G.S. confirmed – 24, G.S. unconfirmed – 2). US sensitivity for vascular complications was 33,3%, and specificity 100%.

Computed tomography (CT) was performed in 16 cases: for 5, biliary complications were suspected (G.S. confirmed – 5, G.S. unconfirmed – 0), for 11 cases biliary complications were not suspected (G.S. confirmed – 3, G.S. unconfirmed – 5). CT sensitivity for biliary complications was 62,5%, and specificity 100%. Vascular complication was suspected for 2 (G.S. confirmed – 2, G.S. unconfirmed – 0), for 14, no vascular complications were suspected (G.S. confirmed – 1, G.S. unconfirmed – 13). CT sensitivity for vascular complications was 66,7%, and specificity 100%.

Magnetic resonance imaging (MRI) was performed in 13 cases: for 9, biliary complications were suspected (G.S. confirmed – 5, G.S. unconfirmed – 0), for 4 cases biliary complications were not suspected (G.S. confirmed – 2, G.S. unconfirmed – 2). MRI sensitivity for biliary complications was 81,8%, and specificity 100%. Sensitivity and specificity of MRI in diagnosis of vascular complications can not be evaluated, because it was not performed for any patient with confirmed vascular complications of liver transplantation.

## Conclusions

1. Age and gender have no influence for emerging of post-liver transplantation complications.
2. Most common post-liver transplantation complications are biliary tract complications, but the result is not statistically significant.
3. US is least sensitive and specific method for biliary and vascular complications evaluation. CT is more sensitive and specific for biliary and vascular complications evaluation than US, but less sensitive than MRI.

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# RELIABILITY AND VALIDITY OF A LITHUANIAN VERSION OF LEICESTER COUGH QUESTIONNAIRE

*Ieva Merkytė*

*Supervisor of the abstract: Kristina Biekšienė, Raimundas Sakalauskas*

*Department of Pulmonology and Immunology, LSMU, Lithuania*

## Introduction

Cough is one of the most common causes of presentation to general practice. Chronic, exhausted cough has a significant impact on the quality of life. Currently, no specific questionnaire for chronic cough exists in Lithuania. So we made a validation of Leicester Cough Questionnaire (LCQ) to evaluate the quality of life for patients with chronic cough. (1,4)

## Aim

To make validity and reliability of a lithuanian version LCQ for patients with chronic cough.

## Objectives

1. To make a translation of LCQ, that would be compatible with original and understandable for patients.
2. To make a validity and reliability of a Lithuanian version of LCQ.
3. To value and to compare the quality of life for patients with chronic cough.

## Methods

The translation of LCQ was made using all methods that are required, following a forward-backward translation procedure. The Questionnaire and Visual Analogue Scale (VAS) was completed by 53 patients with chronic cough (duration of cough > 8 weeks). Spirometry and Bronchial Challenge Test was made by the day patients referred to the clinic. SPSS version 20 was used for data analysis. (5) The Questionnaire was divided into three domains: physical, psychological and social. To validate LCQ we tested three different aspects, i.e. the concurrent validity, the internal consistency and the repeatability. (2,3) Concurrent validity was tested by comparing LCQ with Visual Analogue Scale (VAS). Also we calculated the correlation between all domains and total questionnaire. The Pearson correlation coefficient was used. The internal consistency was calculated by Cronbach's alpha coefficients for three domains. The repeatability (test – retest reliability) was determined by comparing the scores of the first visit to the clinic with the scores of the visit after three weeks. To calculate the repeatability of questionnaire the Intraclass Correlation Coefficient (ICC) was used.

## Results

The Questionnaire was completed by 12 males and 41 females. Respiratory function was normal. The average of age was  $47,75 \pm 14,89$ . The average of duration of cough was  $32,24 \pm 45,87$  months. The sum of total questionnaire was  $12,33 \pm 1,05$ , the average of physical domain was  $4,24 \pm 1,01$ , the average of psychological domain was  $3,76 \pm 1,15$ , the average of social domain was  $4,33 \pm 1,36$ ; VAS  $50 \pm 24,36$ . A strong correlation was established among the domains of the questionnaire: the strongest between psychological and social ( $r = 0,891$ ,  $p < 0,01$ ), the weakest between physical and social ( $r = 0,732$ ,  $p < 0,01$ ). The statistically significant correlation established between the questionnaire and VAS ( $r = -0,396$ ,  $p < 0,01$ ). The weak correlation established between the domains of the questionnaire and VAS: physical ( $r = -0,329$ ,  $p < 0,01$ ), psychological ( $r = -0,406$ ,  $p < 0,01$ ) and social ( $r = -0,365$ ,  $p < 0,01$ ). The Cronbach's alpha coefficient for physical, psychological, social domains and for total questionnaire were 0,787, 0,863, 0,835 and 0,927. The intraclass correlation coefficient (ICC) of the test – retest reliability was 0,89 ( $p < 0,0001$ ).

## Conclusions

1. The Lithuanian version of LCQ is ready, compatible with original and understandable for patients.

2. Leicester Cough Questionnaire appears to be valid, reliable and highly responsive.
3. The psychological quality of life is worse than the physical and social quality of life for patients with chronic cough.

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## RETROSPECTIVE ANALYSIS OF THE CAUSES OF ACUTE BLEEDING FROM THE GASTROINTESTINAL TRACT WHEN RED BLOOD CELL TRANSFUSIONS ARE NECESSARY

*Gintarė Žukauskaitė, Asta Valinčiūtė, Anelė Rudzenskaitė*  
*Supervisor of the abstract: Gediminas Kiudelis*  
*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Acute bleeding (AB) from the gastrointestinal tract (GIT) is one of the most threatening gastroenterological conditions where urgent decisions are needed. Despite the range of reasons for extensive bleeding from the GIT, the principles of their correction are similar: stopping the bleeding and recovery of blood loss volume. Though the principles of bleeding from GIT are obvious, the mortality rate due to this reason still reaches 3-14% [1]. Red blood cell transfusions (RBCT) are carried out in the most serious acute gastrointestinal bleeding cases when the hemoglobin (Hb) content is less than 80 g/L and in cases of unstable hemodynamic (UH). It is therefore purposeful to find out the most life-threatening causes of bleeding, requiring RBCT. Knowing these reasons can be helpful to save time when planning the strategy of management.

### Aim

To analyze the causes of acute bleeding from the gastrointestinal tract, where red blood cell transfusions are necessary.

### Objectives

1. To identify the most common acute bleeding (AB) causes, when red blood cell transfusions (RBCT) are necessary.
2. To identify and compare the levels of hemoglobin (Hb) among the causes of AB.
3. To determine the cause of AB which required the greatest amount of red blood cells (RBC) and to determine the mean amount of RBC which was transfused to one patient, considering the cause of AB.
4. To identify the mean rise of Hb level after RBCT.
5. To identify the most common causes of AB inducing hemodynamic instability.
6. To evaluate mortality of patients with AB who required RBCT.

### Methods

We analysed 169 medical histories of patients who underwent AB from GIT and were treated with RBCT at Hospital of Lithuanian University of Health Sciences Kaunas Clinics, clinic of Gastroenterology in 2013. The demographic (gender, age), medical data (causes of AB, level of Hb, treatment outcomes, hemodynamic stability) and 318 RBCT protocols of the patients were analyzed. 662 units of red blood cells (URBC) transfusions were carried out. The study included 65 women and 104 men. The AB cases were scrutinized according to 7 reasons: I - bleeding from varicose veins (VV), II -

bleeding from ulcers, III - bleeding caused by Mallory-Weiss Syndrome (MWS), IV - bleeding from angiodysplasia (AD), V - bleeding caused by oncological disease (OD), VI - Gastrointestinal tract bleeding of unknown origin, VII – bleeding caused by other causes (OC). Statistical data analysis was performed using Microsoft Excel and SPSS 20.0 software. To compare interdependence of qualitative evidence the  $\chi^2$  criterion was used. The data is statistically significant when  $p < 0.05$ .

## Results

The most common reasons of AB: bleeding from ulcers (35.5%), bleeding from VV (17.6%), GIT bleeding of unknown origin (18.6%), bleeding as a result of OD (10.7%), bleeding caused by MWS (8.2%), bleeding from the AD (6.3%), OC (3.1%).

The mean level of Hb in groups (gr.) before the RBCT differed significantly: I gr.  $-69,5 \pm 9,2$ , II  $-63,9 \pm 12,4$ , III  $-72 \pm 13,4$ , IV  $-67,6 \pm 17,1$ , V  $-65,4 \pm 8,9$ , VI  $-70,9 \pm 8,8$ , VII  $-70,4 \pm 7,1$  g/L,  $p = 0,0$ .

The units of red blood cells (URBC) used for the treatment in groups did not differ significantly. Most often there were administered 2 URBC in all groups,  $p = 0.31$ . 1 URBC mostly there was administered in VI (21.7%), 2-IV (75%), 3-II (22.1%), 4-I group (5.4%). Totally 119 URBC was administered in I, 245-II, 50-III, 46-IV, 72-V, 97-VI, 33-VII group.

The rise of Hb level after RBCT in groups was significantly different: In I group Hb rose  $6.9 \pm 4.8$ , II  $10.1 \pm 5.5$ , III  $9.9 \pm 1.3$ , IV  $9.5 \pm 4.8$ , V  $8.6 \pm 5.4$ , VI  $8.3 \pm 4.6$ , VII  $7.1 \pm 4.9$  g/L on average,  $p = 0.005$ .

Out of 318 AB cases unstable hemodynamics (UH) was observed in 15.1% of cases. Statistically significant difference between the UH in groups was observed: In I group UH was observed in 21.4% of cases, II-2.7%, III-3.8%, IV-10% V-23.5%, VI-33.9%, VII-20%,  $p = 0.0$ .

20 (11.8%) out of 169 patients died as a result of AB. The number of deaths in groups differed significantly: 20% of patients died in I gr., 4.3%-II, 15.4%-III, 14.7%-V, 46.2%-VI, 17.6%-VII, and in IV gr. deaths were not observed.

## Conclusions

1. The most common reasons to transfuse blood in patients with acute bleeding were bleeding from stomach and duodenal ulcers, bleeding from oesophagus, gastric varicose veins and gastrointestinal tract bleeding of unknown origin.
2. The lowermost mean level of hemoglobin was in the group where the acute bleeding was caused by ulcers, and the highest – in the group where the acute bleeding was due to Mallory-Weiss syndrome.
3. To treat acute bleeding usually there were administered 2 units of red blood cells in all groups. The greatest amount of red blood cells was administered to treat acute bleeding caused by ulcers, the least – to treat the acute bleeding due to other reasons.
4. Significantly hemoglobin level mainly rose in cases when patients were bleeding from ulcers, and the least – when the bleeding was from varicose veins.
5. Hemodynamic instability was the most frequent in the group with gastrointestinal tract bleeding of unknown origin, and the rarest - bleeding from ulcers.
6. Overall mortality was 11,8%. Significantly the highest mortality was in the groups with gastrointestinal tract bleeding of unknown origin (46,2%) and bleeding from varicose veins (20%), and the lowest - in the groups of acute bleeding from angiodysplasia (0%) and bleeding from ulcers (4,3%).

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# THE DIFFERENCE BETWEEN PET/CT AND CT IN NON-SMALL-CELL LUNG CANCER'S TNM STAGE

*Paulius Jaruševičius, Ieva Demenytė*

*Supervisor of the abstract: Nemira Jurkienė*

*Department of Radiology, LSMU, Lithuania*

## **Introduction**

Lung cancer is one of the most common oncological diseases in Lithuania. Throughout the years, it remains the second most common cancer among men in Lithuania (1). Lung cancer has two major histological forms – small cell lung cancer (SCLC) and non small cell lung cancer (NSCLC). The latter amounts to 80% of all lung cancer types. Correct staging of NSCLC, using the Tumor, Node, Metastasis (TNM) system, is important when choosing the appropriate treatment for the patient – surgical, chemotherapy, radiotherapy or a combined treatment. The most common tool to determine the stage of lung cancer is computed tomography. Integrated positron emission tomography (PET) and computed tomography (CT) is a new modality, which provides metabolic information about the tumor. Integrated PET-CT has an additional value in comparison with CT and PET alone in a better differentiation of for tumor suggestive lesions as benign or not (2). This method is more accurate in evaluating lymph nodes and distant metastasis compared to CT alone (3).

## **Aim**

To evaluate whether there is a statistically significant difference in NSCLC TNM stage using PET/CT and CT alone.

## **Objectives**

To investigate and calculate the difference between PET/CT and CT in evaluating:

- a) Size of the tumor
- b) Condition of mediastinal lymph nodes
- c) Presence of distant metastasis
- d) TNM stage of lung cancer.

## **Methods**

115 patients (97 men and 18 women) with a median age of  $65.2 \pm 14$  for men and  $68.8 \pm 7$  women were retrospectively included in this study. All of the patients were sent to PET/CT to determine the possibility of radical treatment. Prior to PET/CT these patients had their TNM stages formed according to the information provided by chest CT. The stage of tumor was classified using The TNM Classification of Malignant Tumours, 7th Edition. All patients were examined by GE Discovery VCL scanner and the Eckert & Ziegler Fluorodeoxyglucose (18FDG) radiofarmaceutical was used during the test. Based on patients, weight,  $322.7 \pm 38.4$  MBq of 18FDG was injected, the scan was performed  $60.0 \pm 5.2$  minutes after the injection. The following results were compared:

- a) The area of metabolically active zone in PET/CT with the area of consolidation in CT.
- b) Metabolically active nodes in PET/CT with pathological nodes in CT. Nodes were considered metabolically active if their uptake of 18FDG was greater than  $2.5\text{SUV}_{\text{max}}$  or greater than normal uptake of the mediastinum. Pathological nodes in CT were considered those whose short axis was more than 1cm.
- c) Assessment of distant metastasis in full body scans (PET/CT).

Stage of NSCLC after PET/CT was formed based on the size of the tumor, spread to the nodes and possible distant metastasis. This stage was compared to the clinical stage, which was formed after CT scan. Statistical analysis was calculated with IBM SPSS Statistics 20. Statistical significance was tested using McNemar's test with significance level of 95% ( $p < 0.05$ ).

## Results

1. The PET/CT evaluated size of the tumor (T) was larger in 16 (13.9%) cases, smaller in 46 (40%) cases, the same in 46 (40%) cases. 7 (6.1%) cases could not be evaluated. The difference is statistically significant  $p = 0.031$
2. PET/CT displayed more metabolically active lymph node stations in 26 (22.6%) cases, less in 22 (19.1%) cases, the same amount in 66 (57.4%) cases. 1 (0.9%) Case could not be evaluated. The difference is statistically significant  $p = 0.001$
3. There was no statistically significant difference in assessing distant metastasis ( $p = 0.245$ ). After PET/CT there were 14 (12.2%) new distant metastasis discovered, 5 (4.3%) cases could not be evaluated, In 96 (83.5%) cases there were no distant metastasis after PET/CT scan.
4. While comparing TNM stages after PET/CT 41 (35.7%) stages remained the same, 34 (29.6%) became higher, 30 (26.1%) became lower. In 10 (8.7) cases difference between stages could not be evaluated. This difference is statistically significant –  $p = 0.014$ .

## Conclusions

1. PET/CT showed a statistically significant difference ( $p < 0.05$ ) in assessing the size of primary tumor. In most of the cases the tumor size was smaller.
2. There was a statistically significant difference comparing the value of PET/CT and CT in diagnosing the spread of tumor to node stations ( $p > 0.05$ ).
3. No statistically significant difference was found in the value of diagnosing distant metastasis ( $p > 0.05$ ).
4. PET/CT test altered the stage of NSCLC for about two thirds of patients.

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## THE EVALUATION OF CLINICAL FEATURES AND PREVALENCE OF MYCOPLASMA PNEUMONIAE-RELATED ACUTE HEPATITIS

*Kamila Bąk, Daniel Piątek, Joanna Szydełko, Diana Bajerczak, Magdalena Amarowicz*

*Supervisor of the abstract: Violetta Opoka-Winiarska*

*Medical Student's Association, Pulmonology and Rheumatology Clinic of Children's University Hospital, Medical University of Lublin, Polska*

### Introduction

Viral infections are the most common causes of acute hepatitis. Otherwise, bacterial infections, such as *Mycoplasma pneumoniae*, are extremely rare.

### Aim

The aim of the study was to determine the prevalence and clinical features of *Mycoplasma pneumoniae* hepatitis.

### Objectives

1. Determination the prevalence of *Mycoplasma pneumoniae* extrapulmonary involvements, especially hepatitis.
2. Characterization of clinical features of *Mycoplasma pneumoniae* hepatitis.

3. The assessment of treatment and complications of *Mycoplasma pneumoniae* hepatitis.

### Methods

The analysis of a patient's examination and history, as well as retrospective literature review was done.

### Results

14-year-old boy was admitted to Pulmonology and Rheumatology Clinic of Children's University Hospital in Lublin due to pale pink, maculo-papular rash on the skin of the whole body (especially on the trunk and limbs), fever (up to 39° Celsius), wet cough and musculo-articular pain and tenderness affecting mainly wrist, knee and ankle joints. Physical examination also revealed tender lymph nodes in both angles of the mandible, tonsillitis, as well as, purulent discharge on the back wall of the pharynx. Laboratory tests showed poorly increased parameters of inflammatory state (CRP-8,840 mg/l), cholestasis, the presence of elevated transaminases (ALT 410 U/l, AST-230 U/l), GGTP (46,00 U/l), ferritin (3333ng/ml) and slightly enhanced concentration of potassium (3,82 mmol/l). The infection of hepatotropic and non-hepatotropic pathogens (HBV, HCV, CMV, EBV, Parvovirus B19, HSV, *Mycoplasma pneumoniae*), the autoimmune hepatitis (AIH), alpha 1-antitrypsin deficiency, Wilson's disease were taken into consideration in the differential diagnosis. Immunological test showed high level of IgM antibodies to *Mycoplasma pneumoniae*. On the base of clinical picture and results of laboratory tests *Mycoplasma pneumoniae*-associated hepatitis was diagnosed. Medication with antibiotics, hepatoprotective drugs and potassium was adapted and symptomatic recovery occurred.

According to the literature review results, which confirmation in presented case, *M. pneumoniae*-related hepatitis occurs in 2-5% of all *M. pneumoniae* cases. It occurs frequently in relatively young males and it is more severe in these patients. It's usually observed marked elevation of ALT levels and signs of inflammation.

### Conclusions

The study showed that although *M. pneumoniae* is usually responsible for pneumonia, it's worth to take this pathogen into consideration during differential diagnosis in a patient with fever, rash or high level of ALT and CRP, as effective therapy may prevent one from severe complications.

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## NEUROSCIENCES SESSION

# ANEURISMAL SUBARACHNOID HEMORRHAGE: ASSOCIATION BETWEEN ADMISSION GLUCOSE LEVEL, CLOT CHARACTERISTICS AND CLINICAL OUTCOMES

*Pavel Kačnov*

*Supervisor of the abstract: Egidijus Marcinkevičius*

*Lithuanian University of Health Sciences, Lithuania*

## **Introduction**

Blood volume escaping during rupture of an aneurysm fluctuates from a inconsiderable amount defined as a “warning leak” to massive amounts ( $\geq 150$  mL) associated with immediate death. (4) Up to 67% of subarachnoid hemorrhage (SAH) victims surviving initial hemorrhage in about a week develop narrowing of cerebral arteries. Case-fatality rates vary between 32% and 67% in the first month, after onset of SAH symptoms.(5) A general correlation can be expected between the volume of SAH and clinical grade, risk for vasospasm and other complications (e.g., increased intracranial pressure [ICP], seizures, hydrocephalus), and the extent of the physiologic changes (e.g., reduced cerebral blood flow [CBF] and metabolism), systemic alterations (e.g., hyponatremia, hypovolemia, hypermetabolism), catabolic state, cardiac arrhythmia, and cardiac wall motion abnormalities.(4) Hyperglycemia occurs often in patients with aneurysmal SAH, however relation between hyperglycemia and poor outcome is not consistent across studies. (1,2,3,6)

## **Aim**

The current study seeks to assess association between glucose level on admission and SAH clot characteristics. In addition we attempt to assess whether glucose level on admission has any association with clinical outcome.

## **Objectives**

1. Measure SAH volume using Hijdra sum scoring system, thickness of SAH for each case.
2. Retrospectively evaluate individual glucose levels on admission.
3. Use Pearson's bivariate correlation in order to assess association between measures.

## **Methods**

We reviewed the clinical and radiological data on all adult patients ( $>18$ yo) with aneurysmal SAH treated from November 2010 to December 2013 ( $n = 168$ ). Patients were eligible for the study if: (1) they had a definite subarachnoid haemorrhage, proven by computed tomography (CT) within 4 days after onset of first symptoms. (2) they had an intracranial aneurysm, demonstrated by intra-arterial or by CT angiography, which was considered to be responsible for the recent subarachnoid haemorrhage. Volume of SAH and intraventricular hemorrhage (IVH) was quantified using the Hijdra sum scoring system (HSS), The thickness of the subarachnoid blood was measured across the cistern or fissure (ie, perpendicular to the direction of the cistern or fissure on axial cut) in the thickest-appearing region. Outcomes were assessed using Glasgow outcome scale (GOS) on discharge. The grade was based on the detailed evaluation of rehabilitation medicine physician. Data was analyzed using SPSS 20.0.

## **Results**

Amount of blood in 10 basal cisterns and 4 cerebral ventricles was quantified using Hijdra sum scoring system, 11 patients scored from 1 to 10, 29 patients from 11 to 21, 32 patients from 21 to 30 and 10 patients from 31 to 42. Based on 5-mm increments of SAH thickness, SAH in 11 patients was  $\leq 5$  mm thick, SAH in 25 patients was  $>5$  to 10 mm thick, SAH in 30 patients was  $>10$  to 15 mm thick, SAH in 9 patients was  $>15$  to 20 mm thick and in 5 patients was thicker than 25 mm.

Based on 1-mmol/l increments of blood glucose on admission, glucose below 3 mmol/l mark was not recorded, 2 patients had their blood glucose levels between 3 and 4 mmol/l cutoff points, 6 between 4 and 5 mmol/l, 24 between 5 and 6 mmol/l, 16 between 6 and 7 mmol/l, 30 between 7 and 8 mmol/l, 16 between 8 and 9 mmol/l, 8 between 9 and 10 mmol/l, 8 between 10 and 11 mmol/l, 9 between 11 and 12 mmol/l and blood glucose levels in 10 patients were  $>12$  mmol/l.

Glucose on admission (mmol/l) was positively correlated with HSS and clot thickness ( $r = .319$ ;  $r = .299$ , respectively;  $p < 0.01$ ) and negatively correlated with GOS ( $r = -.409$ ;  $p < 0.01$ ).

### Conclusions

Blood glucose level on admission was associated with thicker, more scattered clot and worse clinical outcome on discharge

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## DISTINCTIVE VERBAL FLUENCY PATTERNS IN ALZHEIMER'S DISEASE, LEWY BODIES DISEASE AND IDIOPATHIC PARKINSON'S DISEASE DEMENTIA

*Kostas Matuzevičius, Augustinas Rotomskis, Andrius Žimkus*  
*Supervisor of the abstract: Arūnas Germanavičius*  
*Vilnius University, Lithuania*

### Introduction

Verbal fluency tests are most often used to assess the function of particular brain areas, primarily frontal and temporal lobes, in patients with known or suspected dementia (1). The frontal lobe function is reflected by the phonemic or letter fluency and the temporal lobe function is reflected by the semantic or category fluency (2). When performing a verbal fluency test the patient is asked to generate as many words as possible starting with a particular letter (e.g. letter F, A, S etc.) – this is called phonemic fluency and to generate as many words belonging to a specific category (e.g. animals, things you can find in a supermarket etc.) – this is called semantic fluency (1). In our study we used the verbal fluency test to assess patients with various forms of dementia: Alzheimer's disease (AD), dementia with Lewy bodies (DLB) and Idiopathic Parkinson's disease dementia (PDD).

### Aim

Our study sought to investigate how various types of Alzheimer's disease, Lewy bodies disease and idiopathic Parkinson's disease dementia can be differentiated with phonemic and semantic fluency tests in the Lithuanian-speaking population.

### Objectives

1. To match the patient and the control groups on age, gender and years of education.
2. To calculate and compare the average of total words generated with a 95% CI for both phonemic and semantic fluency in the patient and the control groups.

3. To determine whether the results were statistically significant by calculating the p value and the mean differences between the patient and the control groups.

### Methods

Patients and controls Consecutive referrals to the Neurology Department of the Vilnius University Hospital Santariskiu Clinics were screened for possible inclusion in the study. All patients fulfilled the diagnostic criteria for their respective diseases(3,4,5). We recruited 107 patients with mild- moderate(MMSE >18) Alzheimers disease, Lewy Body Disease and Idiopathic Parkinson's disease dementia and 90 healthy individuals as a control group(CG) from a Lithuanian speaking population:43 patients with AD(mean age 68.3, SD 8.0, education 12,2 years, SD 2.9), 30 patients with DLB(mean age 69.8, SD 7.4, education 11.6 years, SD 2.9) , 34 patients with PDD(mean age 67.8 years, SD 5.9, education 12.5 years SD 2.9) and 90 healthy individuals were used as a control group(mean age 68.2, SD 8.7, education 12,1 years, SD 3,6). Testing The verbal fluency test adapted for the Lithuanian speaking population was administered to each patient from the dementia group and to each patient from the control group (6). Data analysis Statistical analysis was carried out using SPSS for windows. The mean values of total words produced starting with the letter P and animal names produced in each group with 95% Confidence Intervals(CI) were calculated. A one-way ANOVA with a post - hoc Bonferroni analysis was carried out in all patients groups to see whether the patient groups differed inbetween themselves and compared to the control group on mean verbal fluency scores. The mean difference significance level was set at 0.05.

### Results

There were no significant differences between patient groups and the control group in age ( $p = 0.793$ ), education ( $p = 0.756$ ) or gender ( $\chi^2 = 0.1028$ ,  $p = 0.748$ ). For each group we calculated mean values with 95% CI for total words generated for both phonemic and semantic fluency. Mean words generated with 95% CI for the AD, DLB, PDD and the control group respectively were 7.98 (7.14;8.81), 3.37 (2.82;3.92), 9.47 (7.71;11.23) and 10.99 (9.91;12.07) for phonemic fluency and 8.53 (7.81;9.26), 6.80 (6.38;7.22), 10.85 (9.28;12.43), and 17.15 (15.84;18.48) for semantic fluency. A one-way ANOVA showed us that there were statistically significant differences in both phonemic( $F = 24.479$ ,  $p < 0.01$ ) and semantic fluency( $F = 54.036$ ,  $p < 0.01$ ) between groups. The post-hoc Bonferroni analysis revealed that mean differences of total word generated between the following groups were significant: for phonemic fluency – AD compared to DLB( $p < 0.01$ ), AD compared to CG( $p = 0.01$ ), DLB compared to PDD( $p < 0.01$ ), DLB compared to CG( $p < 0.01$ ), for semantic fluency – AD compared to CG( $p < 0.01$ ), DLB compared to CG( $p < 0.01$ ) and PDD compared to CG( $p < 0.01$ ). The AD(md(mean difference) = 3.01;  $p = 0.001$ ) and the DLB(md = 7.62;  $p < 0.01$ ) groups showed impairment in phonemic and semantic fluency compared to the control group. When comparing AD to DLB verbal fluency impairment was greater in DLB group: (md = -4.61) for phonemic fluency (md = -1.73) for semantic fluency, but only phonemic impairment was significant( $p < 0.01$ ). The PDD groups' scores were only lower compared to the control group but only the semantic fluency(md = -6.3;  $p < 0.01$ ) held statistical value.

### Conclusions

Alzheimers disease should be suspected when both semantic and phonemic fluency is impaired but the semantic fluency impairment is greater than the phonemic fluency impairment. Dementia with Lewy bodies impairs verbal fluency, both phonemic and semantic, most extensively and can be differentiated from AD and IPD by evaluating the mean difference of total words generated which will be significantly lower than in other groups. Patients with idiopathic Parkinson's disease dementia exhibited no significant phonemic impairment compared to the control group, but their semantic fluency scores were lower than those of the control group but not as low as of the patients from AD and DLB groups. The IPD should be suspected when a patient does well on the phonemic fluency test but does poorly on the semantic fluency test(although not as poorly as patients with AD or DLB) compared to the control group of healthy individuals.

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## MECHANICAL THROMBECTOMY FOR ACUTE ISCHEMIC STROKE: MAIN OUTCOMES AT THE HOSPITAL OF LITHUANIAN UNIVERSITY OF HEALTH SCIENCES KAUNAS CLINICS

*Karolis Simaitis, Marija Simaitienė*

*Supervisor of the abstract: Diana Obelienienė, Inga Urbonavičiūtė*

*Neurology department, the hospital of Lithuanian university of health sciences Kaunas clinics, Lithuania*

### Introduction

Intravenous tissue plasminogen activator (IV tPA) leads to improved functional outcomes for patients with acute ischemic stroke. However, the effect of IV tPA diminishes in the case of large vessel occlusion, which is associated with low recanalization rate (21.3%) and poor outcomes [1]. Studies show that mechanical thrombectomy (MTB) may be effectively used in acute ischemic stroke caused by large vessel occlusion [2,3].

### Aim

To evaluate main outcomes of acute ischemic stroke in patients treated with MTB at the hospital of Lithuanian university of health sciences Kaunas clinics.

### Objectives

1. To evaluate MTB effectiveness according to patients' functional outcomes at the time of discharge.
2. To estimate rate of intracranial hemorrhages, brain edema and mortality during hospital stay.
3. To analyze factors, associated with increased risk of symptomatic intracranial hemorrhage.
4. To determine factors, associated with increased mortality rate.

### Methods

From January 2014 to December 2014 in LSMU Kaunas clinics 37 patients had MTB done due to acute ischemic stroke. All these patients (20 men, 17 women; mean age 71.0 (SD 8.3) years) were included to retrospective study. Following data was analyzed: 1) patients' sex and age; 2) medical history; 3) time of onset of symptoms, arrival at emergency department and groin puncture; 4) angiography results; 5) CT images (presence of intracranial hemorrhages, brain edema); 6) functional outcomes. Successful recanalization was defined as complete perfusion with filling of all distal branches, partial recanalization - only a partial perfusion of vascular territory. Intracranial hemorrhages were radiologically classified according SISTS-MOST definition [4]. Symptomatic intracranial hemorrhage was defined as any hemorrhage, which is associated with a decline in NIHSS  $\geq 4$  points. Functional outcomes were defined according to modified Rankin (mRS) scale and measured at the time of discharge (good outcome - mRS 0-2 score, poor outcome -

mRS 3-6 score). Categorical variables were analyzed using chi-square or Fisher's exact test for small samples. Comparison of patients by continuous variables was done using a Student t test. For non-normally distributed data non-parametric tests were used. For all analyses  $p \leq 0.05$  was considered to be statistically significant.

## Results

The mean NIHSS score at admission was 17.4 (SD 4,9). Majority of patients ( $n = 27$ ; 73.0%) received intravenous thrombolytic therapy (IVT) before MTB. The sites of arterial occlusions were as follows: 15 (40.5%) - MCA M1 occlusions, 8 (21.6%) - MCA M2 occlusions, 11 (29.7%) - tandem (combined MCA and ICA) occlusions, 3 (8.1%) - common carotid artery occlusions. The mean time from the onset of symptoms to the beginning of the MTB was 360 (SD 76) min. The average duration of the MTB was 85 (SD 40) min. The average time from admission to emergency department to beginning of MTB was 191.6 (SD 82.7) min.

Successful recanalization was achieved in 19 (57.6%) patients, partial recanalization – in 6 (18.2%) patients, and in 8 (24.2%) cases MTB was completely unsuccessful.

Median mRS score at discharge was 5. Only 7 (18.4%) patients had good functional outcomes, in 31 (81.6%) cases outcomes were poor.

After the treatment with MTB, intracranial hemorrhages were found in 27 (71.1%) patients. Nine (33.3%) of them were symptomatic. Types of hemorrhages were as follows: 16 (59.3%) - petechial hemorrhages, 9 (33.3%) - parenchymal hemorrhages (PH), 1 (3.7%) - intraventricular hemorrhage (IVH) and another one (3.7%) – subarachnoid hemorrhage (SAH). In the presence of PH, IVH or SAH, IVT was done in 11 (100%) cases, while in petechial hemorrhages group IVT was done only in 9 (56.2%) of 16 cases ( $p = 0.022$ ). In a cases of PH, IVH or SAH, 9 (81.8%) of 11 hemorrhages were symptomatic and no symptomatic hemorrhages were found in petechial hemorrhages group ( $p < 0.001$ ). After the treatment, in 12 (32.4%) patients brain edema with midline structures dislocation (MLD) was found. Brain edema with MLD was found in all 8 patients with MCA M2 occlusion, compared to 12 (41.4%) of 29 patients with more proximal occlusions ( $p = 0.036$ ). In successful recanalization group, brain edema occurred in 2 (10.5%) of 17 cases, in partial – 5 (83.3%) of 6 cases, in no recanalization – 4 (50%) of 8 cases ( $p = 0.002$ ). Nine (23.7%) patients died during hospital stay.

When successful recanalization was achieved, symptomatic hemorrhages occurred in 1 (8.3%) of 12 cases, compared to 6 (54.5%) of 11 cases in group with partial or no recanalization ( $p = 0.027$ ). Nine (45%) of 11 patients had symptomatic hemorrhages in IVT group, compared to none of 7 patients in group without IVT ( $p = 0.059$ ).

Neither brain edema, nor extent of recanalization were associated with increased risk of mortality during hospital stay ( $p > 0.05$ ). In cases of symptomatic hemorrhages, 7 (87.5%) of 9 patients died and only 1 (5.6%) of 18 in asymptomatic hemorrhages group ( $p < 0.001$ ). Mean duration from the onset of symptoms to the beginning of the MTB was 449 min in died patients compared to 347 min in alive patients ( $p = 0.025$ ).

## Conclusions

1. The majority of patients had poor outcomes at the time of discharge after MTB;
2. Intracranial hemorrhages were found in majority of patients but only one third of them were symptomatic. In one third of patients brain edema with MLD was found. One fourth of patients died during hospital stay;
3. Occurrence of symptomatic hemorrhage is associated with less extent of recanalization and might be associated with IVT;
4. Symptomatic hemorrhages and longer time window till MTB are associated with increased risk of death during hospital stay.

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## MORPHOLOGICALLY CONFIRMED SPECTRUM OF DESTRUCTIVE VERTEBRAL LESIONS IN NEUROSURGICAL PRACTICE

*Mārtiņš Bremmers, Gvido Janis Bergs*

*Supervisor of the abstract: Ilze Štrumfa*

*Department of Neurology and Neurosurgery, Riga Stradiņš University, Latvia*

### Introduction

Destructive spinal vertebral lesions can significantly impair the life quality due to the pain, compression fractures and neurologic damage [1]. Despite the shared complications, the underlying causes are diverse, including neoplasms, inflammation or degenerative diseases [1,2]. Few studies have analysed the full spectrum of destructive vertebral lesions [3]. However, such data are clinically highly relevant to plan and elaborate evidence-based diagnostic and treatment approach.

### Aim

The study aim was to characterise the whole spectrum of severe vertebral destructions necessitating neurosurgical resection.

### Objectives

In order to accomplish the aim, the following objectives were set:

- 1) to identify a representative study group of consecutive patients undergoing neurosurgical treatment for destructive vertebral lesions and having morphologically confirmed final diagnosis;
- 2) to characterise the cause of vertebral destruction by the tissue analysis;
- 3) to analyse the most frequent anatomic location of destructive vertebral lesions;
- 4) to identify the complications by clinical documentation.

### Methods

The study was carried out in a retrospective design. We enrolled in the study all those consecutive patients admitted to the neurosurgical unit of a single tertiary care hospital (2009–2014) who underwent neurosurgical intervention for a destructive vertebral pathology and had tissue material submitted for morphological diagnostics. Patients lacking morphological data or diagnosed with an extra-vertebral lesion were excluded from the study. The cases were identified by searching the database of Pathology Institute of the relevant hospital. Thorough analysis of the medical documentation was subsequently performed. The following data were retrieved: morphologically confirmed diagnosis, anatomic location of the lesion, patient's age and gender as well as clinical manifestations summarised into the main syndromes (pathologic fracture, spinal stenosis, lower paraparesis, quadriplegia, ileopsoal abscess, other). The diagnoses were verified by microscopic re-evaluation of the retrieved slides. For the analysis, the diagnoses were grouped in the following pathogenetical categories: tumours, degenerative processes, inflammations, other lytic lesions. Descriptive statistics was performed. The mean values were characterised by standard deviation (SD). The 95% confidence intervals (CI) were calculated as described by Altman et al., 2000 [4].

### Results

The study group included 301 patients. Both genders were represented similarly. The mean age  $\pm$  SD was  $61.6 \pm 13.2$  years. Regarding the cause of the disease, malignant tumours were found in 58.8% [95% CI = 53.2–64.4] patients.

Among them, the male: female fractions constituted 50.3:49.7% and the mean age was  $60.1 \pm 13.4$  and  $57.9 \pm 14.6$  years, correspondingly. The most common primary tumour was multiple myeloma, diagnosed in 7.3% [4.8–10.9] patients at the mean age of  $62.6 \pm 9.3$  years. Metastases were significantly more frequent affecting 38.5% [33.2–44.2] patients at the mean age  $60.6 \pm 12.1$ . Breast and prostate carcinoma were the dominant sources of metastasis affecting 6.6% [4.3–10.1] and 6.0% [3.8–9.3] patients at the mean age  $53.2 \pm 11.0$  and  $66.9 \pm 5.1$ , accordingly. The most common degenerative disorder was spondylodiscitis observed in 19.6% [15.5–24.5] patients at the mean age  $64.9 \pm 12.3$ . Purulent osteomyelitis was the most frequent inflammation found in 16.6% [12.8–21.3] of patients aged  $66.5 \pm 10.3$  years. Considering the anatomic location of resected lesions, thoracic and lumbar segments dominated: 45.5% [41.1–49.9] and 44.5% [40.2–48.9] of the study group, respectively. The most common complications included pathological fractures in 16.3% [12.1–20.5], spinal stenosis in 8.0% [4.9–11.1], lower paraparesis in 6.3% [3.6–9.0], ileopsoal abscess in 2.3% [0.6–4.0], radiculopathy and quadriplegia, each observed in 0.7% [0–1.6], and intercostal myalgia in 0.3% [0–0.9] of the study group.

### Conclusions

Malignant tumours, purulent inflammation and degenerative changes must be considered in the differential diagnosis of vertebral destruction necessitating neurosurgical treatment. Metastatic cancer represents the most frequent cause (38.5%). Tumours characterised by reasonable treatment possibilities, as breast and prostate carcinoma, and multiple myeloma, dominate among metastatic and primary malignant tumours affecting vertebrae. The spectrum of causes leading to vertebral destruction underscores the necessity for appropriate systemic treatment in almost all cases. Among the complications, pathological vertebral fractures predominate (16.3%). Neurosurgical resection of destroyed spinal vertebrae is mostly carried out in the thoracic and lumbar spine segment.

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## PHYSICAL ACTIVITY AND DIETARY HABITS IN INPATIENTS WITH SCHIZOPHRENIA

*Krista Brūna*

*Supervisor of the abstract: Ļubova Renemane*

*Riga Stradiņš University, Latvia*

### Introduction

Compared to general population people with mental disorders develop mental illness more often(1). People with schizophrenia tend to have low level of physical activity, which can be due to their mental disorder, medication, lack of motivation (2). People with schizophrenia also tend to consume unhealthy diet high in fat and sugars, possibly leading to various physical health problems. Poor social status, lack of motivation and other contributing factors might be the cause (3).

### Aim

The aim of this study was to evaluate physical activity and dietary habits in patients with schizophrenia currently being treated in psychiatric hospital.

## Objectives

The main objectives were following: (1) to assess level of physical activity; (2) to evaluate dietary habits for patients with schizophrenia in inpatient setting; (3) to determine if there is a link between nutrient intake and physical activity level.

## Methods

The study was designed as a quantitative cross-sectional study and performed by the author in Riga Psychiatry and Narcology Centre. Patients older than 18 years of age with schizophrenia diagnosis F20, according to International Classification of Diseases 10th revision (ICD-10) were included. If the patient agreed to participate and signed the consent form, Dietary Instrument for Nutrition Education (4) was used to assess dietary habits, measuring three categories (fiber, fat, nonsaturated fat) in points (less than 30 points was considered low, 30-40 was considered moderate and more than 40 points - high intake for fiber and fat; less than 6 was considered low, 6-9 was considered moderate and more than 9 points - high intake for unsaturated fat) derived from questionnaire. Level of physical activity was evaluated using International Physical Activity Questionnaire short form for last seven days (5), which assessed physical activity extent in three categories (vigorous, moderate and walking). Amount of physical activity was expressed as Metabolic Equivalent of Task (MET) multiplying days with minutes for each category and multiplying with standardized coefficients included in questionnaire (8.0 for vigorous, 4.0 for moderate activity and 3.3 for walking). Total physical activity was categorised (low, moderate, high). Scales were translated in latvian and russian. Data were recorded and analysed using IBM SPSS.20 statistical analysis software. Descriptive statistics, bivariate and partial correlation, Pearson's Chi-square test and nonparametric Kruskal-Wallis test was used. Results were considered significant if p-value was <0,05.

## Results

A total of 81 participants were included in the study, of whom 38 were women and 43 were men. Mean age was 44,86 years ( $M = 44,86$ ;  $MD = 41 \pm 13,79$ ), it was higher in women group ( $M = 51,58$ ;  $MD = 53 \pm 14,75$ ) than men group ( $M = 38,93$ ;  $MD = 37 \pm 9,69$ ).

None of the participants reported vigorous physical activity and moderate physical activity was reported in 21% ( $N = 17$ ) during last seven days, most being men (94%;  $N = 16$ ). Mean total physical activity was  $1842,22 \pm 1692,64$  METs, and 14,8% didn't report any physical activity (0 METs). There was a strong and significant correlation of total physical activity with walking ( $r_s = .976$ ;  $p < 0.01$ ). In total 39,5% had low, 37% had medium and 23,5% had high level of physical activity. More women than men had low physical activity (55,3% vs 25,6%), with differences being statistically significant ( $\chi^2 = 8,31$ ;  $df = 2$ ;  $p = 0,016$ ).

Mean fiber intake was  $34,16 \pm 13,18$ , mean fat intake was  $30,37 \pm 12,26$  and mean unsaturated fat intake was  $9,06 \pm 0,56$  points. Overall 50,6% ( $N = 41$ ) had low fat and 44,4% ( $N = 36$ ) had low fiber intake. There was a positive correlation between fiber ( $r = .283$ ;  $p = 0,01$ ) and fat ( $r = .393$ ;  $p < 0,01$ ) intake and total physical activity, which remained after controlling for age variable ( $r = .212$ ;  $p = 0,059$  for fiber and  $r = .335$ ;  $p = 0,002$  for fat).

## Conclusions

Overall there was a tendency towards low physical activity and 14,8% ( $N = 12$ ) of all participants didn't engage in any physical activity. Most of participants had low fat intake (50,6%). There was a low but significant positive correlation between fat and fiber intake and total physical activity, which remained significant for fat intake after controlling for age variable. Therefore, level of nutrition must be taken into account when assessing physical activity level in patients with schizophrenia.

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## THE CAUSES, COURSE AND PROGNOSIS OF PROGRESSIVE CEREBRAL INFARCT

*Jolanta Dadzite, Reinis Osins, Evija Miglane, Andrejs Millers*

*Supervisor of the abstract: Evija Miglane*

*Department of Neurology and Neurosurgery, Riga Stradins University, Latvia*

### Introduction

In most people who have had a cerebral infarct (CI), loss of function is usually greatest immediately after the stroke occurs. However, in about 15 to 20%, the stroke is progressive, causing greatest loss of function after a day or two. This type of stroke is called an evolving or progressive stroke (1). However, the worsening of the neurologic deficit is not synonymous with progression of ischemia or enlarging tissue necrosis (2), because some patients deteriorate as a result of systemic causes such as, arterial hypertension, infection and even from applied therapy.

### Aim

To find out progressive CI incidence in clinic and to determine the factors which are the cause of CI symptom progression.

### Objectives

1. Analyze available literature about progressive CI risk factors. 2. Determine the risk factors which can cause the progression of CI. 3. Determine the incidence of progressive CI.

### Methods

The data used in the present was gathered from Pauls Stradins Clinical university hospital from 1st January 2014 till 31st December 2014. Totally there were 908 patients with cerebral infarct (CI) from which 88 patients with progressive CI were included in the study. We assumed progressive CI is 2 or more points in two following days according to the National Institutes of Health Stroke scale (NIHSS). In control group we included CI patients with similar demographic and clinical features without CI progression. All data were analyzed using SPSS predictive analytics software.

### Results

From all CI there were 9.69% progressive CI. There were less progressive CI patients with atrial fibrillation and with cardioembolic CI ( $p < 0.05$ ), but more with atherothrombotic CI ( $p < 0.05$ ). Using Pearson's Chi - Square test brachiocephalic artery pathology were observed less frequently in progressive CI group than in control group, accordingly 67% and 81.8% ( $p = 0.025$ ). We observed a tendency towards progression of CI with clinically significant artery occlusion. There were significant variation in progression of CI with diabetes in CI progression group 19.3% and in control group 9.1% ( $p = 0.052$ ). We observed an association that prescribing clonidine to reduce blood pressure in prehospital phase may lead to CI progression compared to control group, in CI progressing group 19.3% and in control group 9.1% ( $p = 0.052$ ). Mannitol was used in 59.1% in progressive CI group and 18.2% in control group ( $p = 0.00$ ). Intrahospital pneumonia was observed more commonly in progressive CI group than in control group, accordingly 11.4% and 1.1% ( $p = 0.005$ ). The progression of neurologic deficit was observed in first 48h (62.5%) or in first 72h (30.7%).

## Conclusions

1. Factors that may precipitate CI progression are atherothrombotic CI subtype, clinically significant artery occlusion and diabetes.
2. There is an implication that prescribing clonidine in prehospital phase may lead to CI progression.
3. Pneumonia may precipitate CI progression.
4. CI progression is more commonly observed in first 72 hours.

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## THE EFFECT OF WEATHER, SEASON AND LUNAR PHASES AND RISK, SEVERITY AND OUTCOME OF CEREBRAL INFARCT

*Reinis Osins, Jolanta Dadzite, Evija Miglane, Andrejs Millers*

*Supervisor of the abstract: Evija Miglane*

*Department of Neurology and Neurosurgery, Riga Stradins University, Latvia*

### Introduction

Stroke is third leading cause of mortality and disability (1). There is a large consensus regarding the main stroke determinants (2), but little information on its triggering factors such as, temperature, air pressure and humidity, radiation, seasonality and lunar phases. Previous studies have considered the association between weather patterns and stroke, but the results of these studies have been inconsistent (1), therefore we present the investigation of weather patterns and their relationship with stroke in Latvia.

### Aim

The aim of the present study was to determine the relationship between variations in monthly air temperature, pressure and humidity, seasonality and lunar phases and stroke incidence, severity and outcome.

### Objectives

1. Analyze available literature about various weather patterns and their relationship with cerebral infarct.

2. Determine the relationship between different weather patterns and cerebral infarct.

## Methods

The study was retrospective. The data used in present study was gathered from Pauls Stradins Clinical university hospital from 1st January 2014 till 31st December 2014. Totally there were 1186 patients with cerebral infarct (CI) from which 533 patients were included in the study. Inclusion criteria was proved diagnosis of CI, the National Institutes of Health Stroke scale (NIHSS) and modified Rankin scale (mRS) in the day of admission and in the day of check - out, CI event in Riga and 40 km area around it, established date and time of the first symptoms of CI. Exclusion criteria was unknown or missing NIHSS and mRS scale in the day of admission and in the day of check - out, and unestablished location of CI event, unknown date and time of the first symptoms of CI. Other variables we included were patients age, sex, time and date of the symptom onset, CI localization and subtype, mRS, mean hour summary radiation, mean actual air pressure, mean actual, maximal and minimal relative humidity and temperature in the day of CI, 24h, 48h and 72h prior symptom onset. The meteorological data were obtained from 1st December 2013 till 31st December 2014 from Latvian Environment, Geology and Meteorology Centre. All data were analyzed using SPSS predictive analytics software.

## Results

A total of 533 patients were included during the 1 - year study period. The study cohort was 48.9% male and 51.1% female, with mean age 69 in men and 76 in women. The rate of occurrence of stroke was highest in late morning 06:00 - 11:59 hours and in the afternoon 12:00 - 17:59 hours compared with other times of the day. There were no significant variation in stroke incidence, severity and outcome between lunar phases, mean summary radiation, actual, minimal and maximal relative air humidity in the day of the stroke, 24h, 48h and 72h prior the stroke, actual air pressure in the day of the stroke, 24h, 48h and 72h prior the stroke, air actual, minimal and maximal temperature in the day of the stroke, 24h, 48h and 72h prior the stroke, stroke subtype and localization. We also concluded no statistically significant variation between dramatic weather fluctuations and actual air temperature decrease by 5 degrees Celsius and ischemic stroke incidence, severity and outcome. There were significant increase in ischemic stroke in males in spring using Pearson's Chi - Square test ( $p = 0.047$ ). Using pearson's correlation model we also observed a strong negative linear relationship at low relative air humidity ( $r = -0.727$ ) which was statistically significant ( $p = 0.007$ ) and increase in CI which is supported in other researches. We also observed a tendency with moderate positive relationship ( $r = 0.500$ ) towards increased ischemic stroke at high actual air temperature ( $p = 0.098$ ).

## Conclusions

1. Ischemic stroke incidence increases in spring in males, and at low relative humidity.
2. There is a tendency towards increased ischemic stroke at high actual air temperature.
3. Ischemic stroke incidence, severity and outcome is not dependent on from mean summary radiation, actual, minimal and maximal air pressure, relative air humidity and temperature in the day of the stroke, 24h, 48h and 72h prior the stroke, dramatic weather fluctuations, stroke subtype and localization and lunar phases.

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## THE FIRST RESULTS OF THE APPLICATION OF PERCUTANEOUS THROMBECTOMY IN THE TREATMENT OF ACUTE ISCHEMIC STROKE

*Mantas Buitkus, Andrius Strazdas*

*Supervisor of the abstract: Rytis Stasys Kaupas*

*LSMU KK Stroke Diagnosis and Treatment Center, Lithuania*

### Introduction

Stroke is an acute cerebrovascular disorder, during which the brain tissue, which is in the center of the lesion, perishes due to the lack of blood circulation. Stroke is one of the diseases that generally cause disability in the modern world and further rehabilitation of the stroke is very expensive and lengthy. More than 80 per cent of strokes are ischemic after the occurrence of arterial thrombosis or thromboembolism, the remaining cases are caused by hemorrhage. The rapid restoration of the blood circulation is the main goal of treatment, which can be achieved using both intravenous thrombolysis and intervention mechanical thrombectomy, which are successfully carried out since 2014 in LSMU KK Stroke Diagnosis and Treatment Center. The purpose of our work is to discuss the first results of the application of percutaneous thrombectomy.

### Aim

To discuss the first results of the application of percutaneous thrombectomy (PT), which was carried out in LSMU KK Stroke Diagnosis and Treatment Center.

### Objectives

1. To identify the influence of the place of the lesion (occlusion) and the gender to the recourse of percutaneous thrombectomy.
2. To identify the clinical success (left alive) dependence on technical success.
3. To identify the clinical success (left alive) dependence on time until the beginning of thrombectomy.

### Methods

40 case histories of patients, who were diagnosed with acute ischemic stroke and for whom mechanical thrombectomy was carried out in LSMU KK Neurology Clinic in 2014, were analyzed retrospectively. The data were collected using the questionnaire, which was compiled by the researcher and this questionnaire is composed of two types of questions. The first group includes social data (gender, age), the second group includes the data on stroke and performed mechanical thrombectomies (disease time, the lesion side and the place, the heart rhythm disorder, time to the thrombectomy, the thrombectomy technique, the duration and outcome of the procedure, thrombolysis applied / not applied, revascularisation time, the patient's survival after treatment). The statistical analysis was performed using "SPSS 22.0", "MS Office Excel 2011" software packages. "Pearson Chi- Square" test was used to evaluate the relationship between the data. The data were considered statistically significant when  $p \leq 0,05$ .

## Results

The data of 40 patients were analyzed: 21 men ( $66,62 \pm 8,3$  years old), 19 women ( $73,68 \pm 5,44$  years old). The procedure of the mechanical thrombectomy was successfully completed in 27 (67.5 per cent) cases and the procedure failed in 13 (32.5 per cent) cases. The most common places of artery lesions (occlusions) were identified: a. carotis interna (ACI) – 14 (35 per cent), a. cerebri media (ACM) – 21 (52.5 per cent.), multiple lesions – 4 (10.0 per cent), a. cerebri anterior (ACA) – 1 (2.5 per cent).

Localizations of the mechanical thrombectomy were successfully completed: 16 out of 23 ACM (69.6 per cent), 7 out of 23 ACI (30.4 per cent)  $p = 0.109$ . It was found, that in the group of patients, for whom the procedure was carried out successfully, the men accounted for 17 out of 27 (63.0 per cent), and women 10 out of 27 (37.0 per cent),  $p = 0.056$ .

After the procedure, regardless of its success, 27 (67.5 per cent) patients survived and 13 (32.5 per cent) patient outcomes were lethal. The patients, for whom the mechanical thrombectomy was successfully completed, were alive 20 out of 27 (74.1 per cent), and after failure survived 7 out of 13 (53,8 per cent),  $p = 0.179$ .

Time from the beginning of the disease to the beginning of PT: for 26 (65 per cent) patients the thrombectomy intervention was started in less than 6 hours, and for 14 (35 per cent) later than after 6 hours. The treatment of all surviving patients 18 (66.7 per cent) was started in less than 6 hours, and 9 (33,3 per cent) after 6 hours from the beginning of the disease.

## Conclusions

We did not receive statistically significant results due to the small research sample, but such tendencies are observed:

1. The place of the lesion (occlusion) affects the result of the percutaneous thrombectomy. Better results were observed, when the lesion was identified in ACM area, comparing to ACI. It was found that the success of the procedure is higher for men than for women.
2. It was found, that patients, for whom the mechanical thrombectomy was successful, survived more often than the patients, for whom the procedure was unsuccessful.
3. We determined that the number of the surviving patients, for whom the mechanical thrombectomy was started in less than 6 hours from the beginning of the disease, was twice higher comparing to the patients, for whom the procedure was started later than after 6 hours.

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## THE RELATION BETWEEN EPILEPTIC SEIZURES AND BRAIN TUMORS

*Paulina Kvedaruskaitė, Sandra Prochorskaitė*

*Supervisor of the abstract: Giedrė Jurkevičienė*

*Department of Neurology, LSMU, Lithuania*

### Introduction

Epilepsy is a chronic polietiologic neurological disorder, characterized by repeated epileptic seizures (ES). Frequent causes of ES are brain tumors (BT) (1-4). Different histological variants of tumors trigger ES in unequal rates (2,5).

## Aim

To establish links between demographical, BT clinical characteristics and the occurrence of ES in patients with BT.

## Objectives

1. To investigate the ES occurrence rate in patients with BT.
2. To assess the relation of ES with sex and age.
3. To assess the link between ES occurrence and BT clinical characteristics (tumor type, whether it is newly diagnosed or a relapse).
4. To assess the links between age, sex, tumor type and ES recurrence after the surgical removal of BT.

## Methods

A retrospective study was done, analysing the discharge summaries and medical records of 130 patients with supratentorial brain tumors who had undergone brain surgery in the Neurosurgery department of LSMU Kauno klinikos Hospital during the period of 2013 01 01 – 2013 12 31. Demographic (age, sex) and ES occurrence data as well as BT clinical characteristics (type, relapse) were collected. Statistical analysis was performed using Excel and SPSS. Data is presented in absolute values and percentages. Means and confidence intervals ( $M \pm CI$ ) are used for numerical variables and Student's t-test was used to compare means. Interdependence between categorical variables was assessed using  $\chi^2$  test. Results were considered statistically significant when  $p < 0.05$ .

## Results

The study sample ( $n = 130$ ) consisted of 78 (60%) women and 52 (40%) men. The average age was  $60.7 \pm 2.9$  years. The BT types were: 47 (36.2%) glioblastomas, 50 (38.5%) meningiomas, 9 (6.9%) astrocytomas, 8 (6.2%) cavernomas, 5 (3.8%) other gliomas, 11 (8.4%) other tumors. The BT was newly diagnosed for 117 (90%) subjects and was a relapse for 13 (10%).

24 (18.5%) subjects experienced an ES. It was the first symptom of the BT for 16 cases (12.3% in the general group and 66.7% in the group that had an ES).

13 (16.7%) women ( $n = 78$ ) and 11 (21.2%) men ( $n = 52$ ) experienced an ES ( $p > 0.05$ ). The average age of the ES group was  $50.8 \pm 6.9$  years while for the non-ES group it was  $62.9 \pm 3.0$  years. ( $p < 0.05$ ).

Among the subjects with glioblastomas ( $n = 47$ ), 7 (14.9%) had an ES, meningiomas ( $n = 50$ ) - 5 (10%), astrocytomas ( $n = 9$ ) - 4 (44.4%), cavernomas ( $n = 8$ ) - 3 (37.5%), other gliomas ( $n = 5$ ) - 2 (40%), other tumors ( $n = 11$ ) - 3 (27.3%) ( $p > 0.05$ ).

In the newly diagnosed BT group ( $n = 117$ ), 18 (15.4%) subjects had an ES, while in the BT relapse group ( $n = 13$ ) 6 (46.2%) did ( $p < 0.05$ ).

After surgical removal of the BT, ES recurred for 6 (25%) patients that had an ES beforehand.

From the group that had an ES before surgery, ES recurred for 4 (30.8%) women ( $n = 13$ ), and for 2 (18.2%) men ( $n = 11$ ) ( $p > 0.05$ ).

The average age of the group where ES recurred ( $n = 6$ ) was  $54.7 \pm 8.5$  years, while the average age of the group without an ES recurrence ( $n = 18$ ) was  $49.6 \pm 8.8$  years ( $p > 0.05$ ).

After surgical removal of a glioblastoma ( $n = 7$ ), ES recurred for 1 (14.3%) subject, meningioma ( $n = 5$ ) - 2 (40%), astrocytoma ( $n = 11$ ) - 1 (25%), cavernoma ( $n = 3$ ) - 1 (33.3%), other types of glioma ( $n = 2$ ) - 1 (50%), other BT types ( $n = 3$ ) - none ( $p > 0.05$ ).

After surgical removal of a newly diagnosed BT ( $n = 18$ ), ES recurred for 5 (27.8%) subjects, relapsed BT - 1 (16.7%) ( $p > 0.05$ ).

## Conclusions

1. About 1/5 of the subjects experienced an ES. This is somewhat lower than the data presented in literature (30-70%) (1, 2). It was the first symptom of the BT for about 1/10 of the subjects in the general group and 2/3 of the subjects in the group that experienced an ES.
2. On average, the subjects with ES were significantly younger than the subjects without ES.
3. ES occurred less often for subjects with a newly diagnosed BT, than for subjects with a relapsed BT.

4. Although meningiomas and glioblastomas made up 3/4 of the BT, ES were more often caused by astrocytomas, cavernomas and other types of gliomas (oligodendrogliomas). This is generally consistent with literature data, although the ES frequency was lower in the case of meningiomas (2, 5).
5. ES reoccurred for 1/4 of the subjects with ES after the operation. No significant associations of ES reoccurrence frequency with sex, age, tumor type and relapse was possible to detect due to the small number of cases.

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## THE ROLE OF SPETZLER-MARTIN GRADING SYSTEM IN MANAGEMENT OF PATIENTS WITH INTRACRANIAL ARTERIOVENOUS MALFORMATION

*Marija Simaitienė, Karolis Simaitis, Gabrielė Mačionytė*

*Supervisor of the abstract: Egidijus Marcinkevičius, Rytis Kaupas*

*Department of Neurosurgery, LSMU, Lithuania*

#### Introduction

Brain arteriovenous malformation (AVM) is a pathology with an abnormal connection between arteries and veins, bypassing the capillary system. The current treatment of AVMs includes surgical excision, stereotactic radiosurgery, and endovascular techniques but the gold standard of treatment is surgical extirpation of AVM nidus in order to completely reduce the risk of haemorrhage [1]. Spetzler-Martin grading system (SMGS) has been widely accepted to estimate treatment risks and predict the outcome of patients with intracranial AVM and currently, the majority of neurosurgeons and interventional neuroradiologists worldwide choose treatment option according to this grading system [2-4].

#### Aim

To compare management decision of brain AVM with recommended treatment option according to estimated surgical risk by SMGS.

#### Objectives

1. To select theoretical treatment options by counting SMGS indices and to compare with chosen ones.
2. To compare complications rate within chosen treatment options.
3. To identify complications rate in mismatched treatment option cases.

## Methods

From January 2005 to February 2014 90 patients with AVM were treated in Neurosurgery department, LSMU University Hospital. In the final retrospective analysis 68 adult patients (48 men and 20 women, mean age 43.19 years (SD 14.1)) who had surgery alone or combined with endovascular treatment, endovascular treatment or observation alone, and whose angiograms were available in database, were included. Demographic data, management decision and complications (ischemic, haemorrhagic, new onset of epileptic seizures, cerebral oedema) were analysed from patients case files while patients' neuroimaging (CT and/or MRI) and cerebral angiograms were interpreted together with experienced invasive radiologist and neurosurgeon. Neuroimaging findings included localisation of the AVM and presence of haemorrhage. In cerebral angiograms localisation and size of AVM (maximum transverse diameter of the nidus), type of the venous drainage (superficial or deep) were analysed. This data was used to count SMG (grades I-V) and to estimate the risk of AVM surgery. These grades were used to determine theoretical treatment option that should have been selected: I-II grades - surgery alone, III – combined endovascular and surgical treatment, IV-V – surgery not indicated [2,3]. Mismatched cases within treatment decision in LSMU and theoretical treatment option by SMGS were counted.

Rates were compared using  $\chi^2$ . For non-normally distributed data non-parametric tests were used.  $p < 0.05$  level was considered to be statistically significant.

## Results

In LSMU 5 (7.4%) of 68 patients had surgery alone, 7 (10.3%) - combined with endovascular treatment, 56 (82.3%) - endovascular treatment or observation alone while after counting SMGS grades, surgery alone should have been performed in 29 (42.6%) cases, combined with endovascular treatment in 18 (26.5%) cases and for 21 (30.9%) patients surgery was not indicated. These differences within mismatched cases were statistically significant ( $p < 0.05$ ). Twenty (29.4%) of all patients had early complications after AVM treatment. In endovascular treatment group 14 (28.6%) of 49, in surgical treatment group - 3 (60%) of 5, in combined group 3 (42.9%) of 7 patients received complications though the difference was not statistically significant ( $p = 0.18$ ). Within patients who experienced complications, 14 (70%) were from mismatched group. The majority of mismatched cases (78.6%) belonged to endovascular treatment group. Mean embolisation rate in endovascular treatment group was 2.17 (SD 1.1) per person. Within patients who did not experience complications, mean embolisation rate was 1.91 (SD 1.0), while within patients with complications – 2.54 (SD 1.1) ( $p = 0.05$ ).

## Conclusions

1. In LSMU neurosurgeons more often chose endovascular treatment in cases where surgical treatment was available according to SMGS.
2. Surgical extirpation of I-II grade AVM is not associated with increased risk of complications.
3. Complication rates were high in mismatched group and might grow within the number of repeated embolisations.

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## **OBSTETRICS & GYNAECOLOGY SESSION**

# BREAST MRI: PROGNOSTIC ROLE OF MORPHOLOGIC, KINETIC AND NEOANGIOGENETIC FEATURES IN PATIENTS WITH BREAST CANCER

*Ieva Demenytė, Paulius Jaruševičius*

*Supervisor of the abstract: Eglė Jonaitienė*

*Department of Radiology, LSMU, Lithuania*

## **Introduction**

MRI is the most accurate method of detection of invasive breast cancer having nearly 100% sensitivity. MRI plays a crucial role in tumor prognosis in addition to classic prognostic factors of histologic type, grade, receptors, and axillary lymph node metastasis. However, association between MRI morphologic, kinetic and neoangiogenetic features and classic prognostic factors is not well-known.

## **Aim**

To evaluate the association of breast cancer neoangiogenetic, morphologic and kinetic MRI features with prognostic factors in patients with unilateral tumor.

## **Objectives**

1. To determine most common MRI features of breast cancer.
2. To evaluate correlation between neoangiogenetic features and prognostic factors.
3. To evaluate correlation between morphologic, kinetic features and prognostic factors.

## **Methods**

Data of women with breast cancer diagnosed by biopsy who underwent MRI between 2014 and 2015 was retrospectively analysed. Patients with carcinoma in situ, or having history of chemotherapy, mastectomy or bilateral cancer, were excluded.

Morphologic and dynamic enhancement features were analyzed according to the BI-RADS MRI lexicon. Margins, internal enhancement of the lesions and kinetic curve type were evaluated. Margins were classified as „not spiculated“ or „spiculated“, and internal enhancement was evaluated as „no rim enhancement“ or „rim enhancement“. Tumor size was measured and then classified into 3 groups according to TNM classification. Pathologic lymph nodes (LN) were also recorded.

The adjacent vessel sign and the whole-breast vascularity were evaluated. To evaluate the increased whole-breast vascularity a modification of the method of Sardenelli et al. was used. The number of vessels per breast 3 cm or longer and 2mm or larger in maximal transverse diameter were counted. The degree of vascularity differences were classified as „prominent“ if the number of vessels in the cancer-bearing breast was higher by three or more than in the other breast, „moderate“ if higher by two, „mild“ if higher by one, and „not increased“ if the number of vessels in the cancer-bearing breast was same or lower. Presence of vessels more than 3 mm in diameter was also recorded.

Histopathologic features: histologic type, histologic grade, presence of estrogen receptor (ER), progesterone receptor (PR), and expression of the C-ERBB2, were recorded.

For analysis, a chi-square test was used to determine the relationship between neoangiogenesis, BI-RADS MRI lexicon and prognostic factors. A p value of less than 0.05 was considered to indicate statistical significance.

## **Results**

Data of 74 women aged from 26 to 56 (mean age was 52.91) were analysed. Tumor was located in left breast in 41 cases (55.4%) and in 33 cases (44.6%) in the right. Tumor size varied from 5 to 92 mm, the mean tumor diameter was  $29.91 \pm 2.13$  mm. In 26 cases, lesions were 2 cm or smaller, in 39 cases they were 5 cm or less, and in 9 cases they were larger than 5 cm. Metastasis in LN had 31 patients (41.9%).

Tumor margins were spiculated in 32 cases (63.5%), 45 lesions had rim enhancement (60.8%). Washout kinetic curve type was found in 54 tumors (73.0%) and plateau type in 20 (27.0%).

A positive adjacent vessel sign was found in 65 patients (87.8%), vessels larger than 3 mm in diameter were found in 36 cases (48.6%). Prominent cancer-bearing breast vascularity had 13 patients (17.6%), 12 had moderate (16.2%), 22 mild (29.7%), and 27 not increased (36.5%).

The adjacent vessel sign and the increased ipsilateral whole-breast vascularity were significantly associated with tumor size ( $p < 0.05$ ). Vessel larger than 3 mm in diameter was significantly associated with LN metastasis and tumor size ( $p < 0.05$ ). Tumor margins were significantly associated with tumor size and expression of PR and ER ( $p < 0.05$ ). The kinetic curve type was significantly associated with LN metastasis ( $p < 0.05$ ).

### Conclusions

1. The most common morphologic feature of malignant tumor was spiculated margins, neoangiogenetic – positive adjacent vessel sign, and kinetic – washout curve type.
2. All neoangiogenetic features were significantly associated with tumor size. Moreover vessels larger than 3 mm were associated with LM metastasis.
3. Spiculated margins were associated with tumor size and expression of receptors. The kinetic curve type was significantly associated with LN metastasis.

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## DEPENDENCE OF CHEMOTHERAPY START TIME ACCORDING TO ITS CLINICAL FACTORS WHILE TREATING PRIMARY OVARIAN CANCER.

*Monika Stasiūnaitė, Brigita Motiejauskaitė*  
*Supervisor of the abstract: Eimantas Švedas*  
*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Ovarian cancer is the leading cause of death from gynecologic malignancy. Surgery and chemotherapy are the standard of care for ovarian cancer. While most clinicians assume that adjuvant chemotherapy should commence as soon as possible, factors such as postoperative complications or logistical issues (e.g. delays in referral or waiting times) may postpone the treatment. Since the optimal timing of chemotherapy after surgery has not previously been studied it is currently not clear whether the delay in administering the cytotoxic treatment adversely affects the prognosis of patients with ovarian cancer.

### Aim

Dependence of chemotherapy start time according to its clinical factors while treating primary ovarian cancer.

### Objectives

1. To evaluate if surgical radicality has any impact on time before starting chemotherapy while treating primary ovarian cancer.

2. To evaluate if postoperative complications (infection, anemia) have any impact on time before starting chemotherapy while treating primary ovarian cancer.
3. To evaluate if other female diseases' (diabetes mellitus) have any impact on time before starting chemotherapy while treating primary ovarian cancer.
4. To analyse whether a connection between primary ovaries cancer complications such as ascites or peritoneal adhesions and the time taken
5. To determine the average amount of time from the surgery until the start of chemotherapy is LSMU KC.

## Methods

Retrospective study was performed on primary ovarian cancer patients that were operated on and treated with chemotherapy LSMU KC 2010-2014, a total of 205 patients. Data was collected from the Department of Obstetrics and Gynecology Operations Registry and LSMU KC information systems (HIS). The time from surgery to the first course of chemotherapy was observed and evaluated as well as risk during operation, complications during operation (intestinal damage), postoperative complications (infection, anemia), complications of disease (ascites, adhesions), other female diseases' (diabetes mellitus) rehabilitation. Analysis was performed with "SPSS 20.0". Patient data was used to evaluate the selected sample of descriptive statistics – absolute (n) and percentage rates (pct) with statistically insignificant difference from the normal arithmetic mean. Significance of the data was evaluated using Student's t-test. A  $p < 0.05$  was considered as statistically significant.

## Results

We estimate that on average  $28 \pm 0,98$  days pass between the surgical treatment and the first chemotherapy course. There were 37.7pct (n = 67) radical operations performed, 41.5pct (n = 84) optimal cytoreductive operations performed and 21.6 pct (n = 54) suboptimal cytoreductive operations performed. After radical operation patients went to the Chemotherapy Day Unit after  $31,93 \pm 1,83$  days; after the optimal cytoreductive operation -  $25,81 \pm 1.36$  d. and after suboptimal cytoreductive operation  $26,54 \pm 1,97$  d.,  $p > 0,05$ . The percentage of women who had postoperative anemia was 54.6pct (n = 112). Patients that suffered from anemia went to the Chemotherapy Day Unit after approximately  $27,37 \pm 1,29$ d., in contrast the ones that did not suffer from the disease went after  $28,76 \pm 1,52$  d., statistically there were not any major differences found ( $p > 0,05$ ). 21.9pct (n = 45) were diagnosed with postoperative infection and they went to the Chemotherapy Day Unit after approximately  $31,49 \pm 2,35$  d., on contrary, patients that did not have the infection went to the Chemotherapy Day Unit after  $27,02 \pm 1,06$ d. ( $p > 0.05$ ). 17pct (n = 35) patients suffered from anemia and infection, they started their chemotherapy course after  $32,09 \pm 2.57$ d. Women that did not have any above-mentioned complications (40pct (n = 82)), started the chemotherapy course after  $28.96 \pm 1,59$ d. During operation, peritoneal adhesions were found in 42.9pct (n = 88) of patients, they began the chemotherapy course later (after  $29,60 \pm 1,63$ d.) comparing to patients that did not have any peritoneal adhesions (after  $26,79 \pm 1,22$ d.),  $p = 0.045$ . During the operation 51.7pct (n = 106) of patients were diagnosed with ascites, they began the chemotherapy course after  $27,45 \pm 1,27$ d. Women that did not have ascites started chemotherapy after  $28,59 \pm 1,51$ d.,  $p > 0,05$ . 6.3pct (n = 13) of patients suffered from diabetes, they started the first chemotherapy course  $29,31 \pm 4,12$ d. Females that did not have this disease started chemotherapy after  $27,91 \pm 1,01$ d.,  $p > 0,05$ .

## Conclusions

1. Statistically, there were no major differences found between surgical radicality and chemotherapy start time.
2. There were no connections found between postoperative anemia and infection or chemotherapy start time.
3. Diabetes mellitus did not have any impact on chemotherapy start time.
4. Patients that had peritoneal adhesions started their first chemotherapy course later than women that did not have peritoneal adhesions. The diagnosis of ascites did not have any impact on chemotherapy start time.
5. After primary ovarian cancer operations, patients started the first chemotherapy course after approximately 28 days.

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## DIFFERENCES IN OBSTETRIC ANAMNESIS, DISEASE COURSE AND TREATMENT STRATEGY OF PREGNANT WOMEN HAVING PYELONEPHRITIS WITH OR WITHOUT HYDRONEPHROSIS

*Simona Juciūtė, Rolandas Gedgaudas*

*Supervisor of the abstract: Laura Malakauskienė*

*Department of Obstetrics and Gynaecology, LSMU, Lithuania*

### Introduction

Dilating effect of progesterone and mechanical compression of the enlarging uterus results in stasis of urine and dilatation of renal pelvis (hydronephrosis) in up to 80% of pregnancies. Due to the stasis of urine, pregnant women are prone to develop urinary tract infections such as pyelonephritis, which is one of the most common conditions for hospitalisation among pregnant women.

### Aim

To assess and compare the anamnesis, disease course and treatment strategy of the pregnant women having pyelonephritis with or without hydronephrosis.

### Objectives

1. To evaluate association of obstetrical anamnesis for development of pyelonephritis with or without hydronephrosis.
2. To determine the most common pathogen of pyelonephritis with or without hydronephrosis.
3. To assess difference of the pyelonephritis course in groups with or without hydronephrosis.
4. To compare treatment strategy for pregnant women with or without hydronephrosis.

### Methods

The retrospective data analysis of medical cases of pregnant women treated for pyelonephritis in Kaunas Hospital of Lithuanian University of Health Sciences (LSMU), in Obstetrics and Gynaecology Department during year 2011-2014. The medical records of patients were selected according to the disease code TLK-10- AM N10. Obstetrical anamnesis, signs of preterm labour, urine culture results, conclusions of kidney ultrasound examination, CRP values in blood samples, clinical course and treatment strategy were assessed. Patients were considered having hydronephrosis when ultrasound conclusions noted dilatation of renal pelvis. Patients with pyelonephritis were divided into two groups: patients with hydronephrosis (Group 1) and patients without hydronephrosis (Group 2). A statistical data analysis was performed via SPSS 22.0. Data was considered statistically significant when p (significance level) value was <0.05.

## Results

A total of 155 pregnant women diagnosed with pyelonephritis were included in the study. Hydronephrosis was diagnosed for 110 (71%) patients and 45 (29%) women had no case of hydronephrosis. Comparing the average age in both groups, group 1 was younger than group 2 ( $24.3 \pm 5.5$  vs.  $26.3 \pm 6.3$  years) ( $p < 0.05$ ). More women in group 1 than in group 2 were primipara (76 (61.9%) vs. 24 (53.3%)) ( $p < 0.05$ ). Comparing the course of a disease between group 1 and 2, more patients had fever in group 1 (76 (69.7%) vs. 21 (47.7%)) ( $p < 0.05$ ). Just 1 patient of group 1 gave preterm birth. There were no significant difference of empiric antibiotic therapy in both groups ( $p > 0.05$ ). Women of group 1 didn't need more modification of treatment after urine culture results ( $p > 0.05$ ) compared with group 2.

## Conclusions

1. Women diagnosed with hydronephrosis were significantly younger and more frequently were primiparas.
2. The most frequent pathogen was E. Coli and it did not significantly differ within patients with or without hydronephrosis.
3. Patients with hydronephrosis statistically significantly more often had fever, higher CRP value and their duration of treatment was longer.
4. The empiric treatment and frequency of treatment modification after urine culture results did not significantly differ within patients with or without hydronephrosis.

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## EFFECT OF TWIN-TO-TWIN DELIVERY INTERVAL ON PERINATAL OUTCOME OF THE SECOND TWIN

*Sabina Špiliauskaitė*

*Supervisor of the abstract: Ieva Daunoravičienė*

*Department of Obstetric and Gynecology, Vilnius University, Lithuania*

### Introduction

Approximately 10% of perinatal complications occur in twin pregnancies, which in turn constitute 1% of all pregnancies. Perinatal mortality rates are 3-6 times higher in twin pregnancies, than singleton pregnancies. With the widespread use of more successful fertility treatments, more women are delivering twins. Therefore multiple gestation is a very relevant obstetric topic. The current study was performed to investigate the perinatal outcome of the second twin according to the twin-to-twin delivery interval. There is not enough data that shows what optimal twin-to-twin interval should be to have good second twin outcome.

### Aim

The aim of this study is to find out a relationship between twin-to-twin delivery interval and perinatal outcome of the second twin.

## Objectives

Perinatal outcome measurements in this study included umbilical cord venous blood gas parameters (pH, pCO<sub>2</sub> results), Apgar score after 1 and 5 minutes, need for neonatal resuscitation, intubation, mechanical ventilation and oxygen therapy needs.

## Methods

This retrospective study was performed at Vilnius City Clinical Hospital (VMKL) Obstetrics and Gynecology Clinic. Only dichorionic diamniotic twin deliveries, at or above 34 weeks ( $\geq 34+0$ ) of gestation, with a vaginally delivered first twin, were collected over a period of 4 years (January 2011- December 2014). Data used in this study was collected from the delivery records of each case. Pregnancies, with intrauterine death of either one of the twins before the onset of labour, complications of preeclampsia, eclampsia, twins with fetal malformations and intrauterine growth restriction were excluded. The correlation between the twin-to-twin delivery interval and umbilical cord venous blood gas parameters including pH, pCO<sub>2</sub> of the both twins were studied. Additionally, Apgar score, neonatal resuscitation of the twins, intubation, mechanical ventilation and oxygen therapy needs were compared in both twins. Twin-to-twin delivery interval was defined as the time interval between the deliveries of the first twin (Twin1) and the second twin (Twin2). The statistical analysis was performed using IBM SPSS Statistics 22.0 and MS Office Excel. P-values of  $<0.01$  were considered statistically significant.

## Results

In total 84 cases were reviewed. The mean gestation at delivery was 36.7 weeks. In 83 (98.81%) women Twin1 had normal vaginal delivery while only 1 (1.19%) had an assisted vaginal delivery. The mode of delivery of Twin2 was normal vaginal birth in 68 (80.95%) cases, assisted breech delivery 12 (14.29%), instrumental delivery 2 (2.38%), and cesarean section in 2 (2.38%) cases. The distribution of twins by presentation during delivery (before II stage of labour) included 67 (79.76%) vertex-vertex pairs, 17 (20.24%) vertex-nonvertex pairs. The mean twin-to-twin delivery interval was 7.9 minutes  $\pm$  5.6. The minimum interval was 2 minutes and the maximum was 33 minutes. There was significant negative correlation between twin-to-twin delivery interval and umbilical cord venous blood pH of second twin  $r = -0.52$  ( $p < 0.01$ ) and significant positive correlation between twin-to-twin delivery interval and pCO<sub>2</sub> of second twin  $r = 0.42$  ( $p < 0.01$ ). The longer the interval, the lower the pH and the higher the pCO<sub>2</sub> results in second twins. In contrast, the correlation between Apgar score differences between both twins and twin-to-twin delivery interval was not statistically significant: twins after 1 minute  $r = 0.14$  ( $p > 0.01$ ), after 5 minutes  $r = 0.16$  ( $p > 0.01$ ). There were no statistically significant differences between first and second twin when it came to resuscitation, intubation, mechanical ventilation and oxygen therapy needs. Both twins had similar needs of intensive care.

## Conclusions

Umbilical cord gas parameters deteriorate with increasing twin-to-twin delivery interval. The longer the duration, the lower the umbilical cord venous blood pH and the higher the pCO<sub>2</sub> results are noticed in second twin. When twin-to-twin time interval was greater than 16 minutes all second twins showed lower pH than first one. In the most of the cases when the twin-to-twin delivery interval was greater than 17 minutes a severe fetal acidemia (pH $<7.01$ ) was observed in second twin. Our results showed that twin-to-twin interval should be less than 17 minutes. However, obstetrician should be capable of adapting to every clinical situation individually.

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# IMPACT OF PREOPERATIVE ANAEMIA ON CANCER PATIENTS' OUTCOMES AFTER TOTAL HYSTERECTOMY

*Petras Petkevicius*

*Supervisor of the abstract: Kestutis Rimaitis*

*Department of Anesthesiology, LSMU, Lithuania*

## **Introduction**

According to the WHO the prevalence of anaemia is approximately 30% for non-pregnant women.[1] Anaemia should be screened and treated actively, because it is related with higher rates of postoperative complications and mortality.[2] Currently discussions concerning development of algorithms for treating anaemia and reducing postoperative complications and mortality rates are going worldwide.[3]

## **Aim**

To determine the impact of preoperative anaemia on outcomes of patients with cancer diagnosis who underwent total hysterectomy.

## **Objectives**

- 1) To assess the prevalence of preoperative anaemia among the cancer patients before total hysterectomy.
- 2) To determine the difference in outcomes between the anaemic and control group cancer patients after total hysterectomy.
- 3) To determine the difference in need of intraoperative blood transfusion between the anaemic and control group cancer patients after total hysterectomy.

## **Methods**

A retrospective case-control study included patients who had gynecological cancer treated by total hysterectomy at Clinic of Obstetrics-Gynecology, Lithuanian University of Health Sciences. According to the level of preoperative haemoglobin patients were assigned to the 2 groups: 1) anaemic (Hb < 120 g/l); 2) control (Hb > = 120 g/l). Groups were compared with respect to: age, localization of cancer, histopathologic grades of cancer, FIGO classification, type of surgery, preoperative haemoglobin, duration of hospital stay (days), the rate of postoperative complications and mortality, anaemia treatment data.

73 patients were selected. SPSS 21.0 parametric and non-parametric statistical tools were used for statistical analysis where appropriate and  $p < 0.05$  regarded as statistically significant.

## **Results**

Mean age of patients was  $60 \pm 15$  years in anaemic group and  $59 \pm 12$  in control group ( $p > 0.05$ ). Localization of cancer was: ovary 14 (19.4%); body of uterus 9 (12.5%); cervix of uterus 2 (2.8%) in anaemic group and ovary 13 (18%); body of uterus 30 (41.7%); cervix of uterus 4 (5.6%) in control group ( $p > 0.05$ ). Histopathologic grades of cancer: G1 6 (9.7%); G2 6 (9.7%); G3 8 (12.9%); G4 1 (1.6%) in anaemic group and G1 8 (12.9%); G2 23 (37.1%); G3 9 (14.5%); G4 0 in control group ( $p = 0.05$ ). Metastases in lymph nodes in anaemic group was 3 (4.1%) and 0 in control group ( $p = 0.044$ ). Metastases in other organs were 4 (6.1%) in anaemic and 1 (1.5%) in control group ( $p > 0.05$ ). Laparoscopic hysterectomies were 7 (9.5%) and laparotomic were 19 (26%) in anaemic group versus 16 (22%) and 31 (42.5%) in control group ( $p = 0.002$ ).

Prevalence of preoperative anaemia was 26 (35.6%). Diagnosis of anaemia was present in 5 (6.8%) cases. Anaemia was treated in 3 (4.1%) cases: 2 cases with oral iron and 1 case - with erythropoietin.

Rate of postoperative complications was 12 (16.4%), of them: surgical site infection 4 (33.3%); cardiac arrhythmia 3 (25.1%); arterial hypotension 2 (16.7%); eventration 1 (8.3%); surgical site burn 1 (8.3%); exacerbation of heart failure 1 (8.3%).

The rate of postoperative complications was 8 (30.8%) versus 4 (8.5%) in anaemic and control groups respectively ( $p =$

0.02). Mean duration of hospital stay was  $11.5 \pm 3.41$  days versus  $9 \pm 4.48$  days in anaemic and control groups respectively ( $p = 0.044$ ). None of the study patients died. Intraoperative bleeding occurred in 13 (17.8%) study cases. Transfusion of blood products were needed in 10 (76.9%) cases and crystalloids were enough in 3 (23.1%) perioperative bleeding cases. The rate of transfusion was 7 (26.9%) versus 3 (6.4%) in anaemic and control groups respectively ( $p = 0.03$ ). The rate of complications was in 4 (33.3%) versus 8 (15.4%) in cases of blood transfusion and without transfusion respectively ( $p > 0.05$ ).

### Conclusions

- 1) The prevalence of preoperative anaemia is 35.6% for patients with oncogynecologic disease. Preoperative anaemia is more likely for patients with ovary cancer, metastases in lymph nodes and before laparotomic surgeries.
- 2) The rate of complication is significantly higher among the anaemic patients. Duration of hospital stay according to our data is approximately  $2 \pm 1.07$  days longer for anaemic patients.
- 3) The rate of transfusion of blood products is much higher for anaemic patients. However, transfusion of blood products showed no impact on the rate of complications.

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## INTESTINAL RESECTIONS DURING THE SURGICAL TREATMENT OF OVARIAN CANCER: FREQUENCY, POSTOPERATIVE MOTION AND COMPLICATIONS

*Karolina Eva Lesniakaitė, Rūta Palionytė*

*Supervisor of the abstract: Saulius Paškauskas*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

In Lithuania in the year 2013, counting all cases when people have died from cancer, 15,6% of them were women, who died because of ovarian cancer.<sup>1</sup> Mostly the early stages of ovarian cancer are asymptomatic and while the disease is progressing, cancer spreads to the peritoneal cavity and it can result in bowel obstruction.<sup>2</sup> The key treatment for the metastasis of ovarian cancer in the bowels is surgical, the damaged segment of the bowel is resected. In this thesis, the frequency of such surgeries, postoperative motion and the main complications are evaluated in retrospect.

### Aim

To evaluate the frequency of bowel resection, the postoperative motion and the complications of patients, who had ovarian cancer and were treated from the year 2006 to 2014 in LSMUL KK Obstetrics and Gynecology department.

### Objectives

1. To establish the frequency of bowel resection among the patients, who were operated due to ovarian cancer.
2. To evaluate the postoperative bowel function recovery after bowel resection.
3. To evaluate the complications after bowel resection.

## Methods

801 medical histories were analysed in retrospect. The medical histories were of patients, who had ovarian cancer and were treated from the year 2006 to 2014 in LSMUL KK Obstetrics and Gynecology department. The analysis includes patients, who had small and/or large intestine resections and appendectomies. The statistical data analysis was performed using SPSS 22.0 statistical software, applying nonparametric U tests. Significance level  $p < 0,05$ .

## Results

1. Out of 801 analysed patients, 29 (3,6%) received conservative treatment. 772 (96,4%) had surgeries and 130 (16,2%) of them had bowel resections or appendectomies, however, it was not possible to obtain more data about 2 patients, thus the further analysis involved 128 (16,6%) patients. The average age of the patients was  $57,6 \pm 1,1$  57 (44,5%) patients had surgeries due to stage IIIc (according to the FIGO staging system) ovarian cancer, 91 (71,1%) were operated due to having cancer for the first time and 37 (28,9%) due to recurrence.

53 (41,4%) patients had 71 large intestine resections (LIR): 26 (38%) of the sigmoid colon; 21 (30%) of the rectum; 10 (14,1%) had the right hemicolectomy; 4 (5,6%) had the left hemicolectomy; 3 (4,2%) of the transverse colon; 2 (2,8%) of the cecum; 2 (2,8%) had colectomies; 2 (2,8%) of the ascending colon; 1 (1,4%) of the descending colon.

27 (21,1%) patients had surgeries of the small intestine and 28 resections were performed: 26 (92,9%) of the ileum; 2 (7,1%) of the jejunum.

During a surgery, a resection of only 1 segment of the bowel was performed to 41 (32%) patients (10 (75,6%) were SIR, 31 (24,4%) were LIR). Resections of 2 or more segments of the bowel were performed to 24 (18,8%) patients (15 (62,5%) patients had both SIR and LIR). 63 (49,2%) patients had only appendectomies.

2. The majority of patients started drinking liquids the 1st day after the surgery: 39,6% after the LIR and 33,3% after the SIR. After resecting 1 bowel segment, on the 1st postoperative day 41,5% of patients started drinking liquids and after resecting 2 or more segments – 33,3%.

Most patients started eating solid food on the 4th postoperative day after LIR (35,8% of patients) and SIR (25% of patients), also 34,1% after resecting 1 segment and 33,3% after resecting 2 or more segments.

The patients, who had SIR, started defecating sooner (41,7% defecated on the 3rd day) compared to those, who had LIR (13,2% defecated on the 4th postoperative day and 7,5% on the 3rd day). After resecting 1 segment, most patients started defecating on the 3rd day – 14,6%, after resecting 2 or more segments an equal amount of patients (12,5%) defecated on the 3rd, 4th and 5th postoperative day.

After an appendectomy, on the 1st day 79% of the patients started drinking liquids and on the 2nd day 43% started eating solid food.

The statistics of postoperative bowel function recovery did not show a significant difference between the patients who had LIR and SIR. Furthermore, there was no statistical significant difference between the patients who had a resection of 1 segment of the bowel and those, who had a resection of 2 or more segments of the bowel.

3. Most common complication after resecting 1 bowel segment was postoperative wound seroma, which occurred to 7 patients, after resecting 2-3 segments postoperative wound suppuration occurred to 3 patients. After SIR the amount of both postoperative wound seroma and wound suppuration was equal – 2 each. After LIR, postoperative wound suppuration occurred to 4 patients.

Among the examined patients, 7 (5,4%) repeated their surgeries due to complications: 1 of them due to rectal anastomosis leakage; 1 due to urinary bladder damage; 1 due to bleeding of the spleen; 1 due to perforation of the sigmoid colon; 1 due to a hematoma in the area of a laparatomical section; 1 due to perforation of the transverse colon; 1 due to alleged peritonitis.

After the surgery, 3 patients died (2,3%): 1 due to a massive pulmonary thromboembolism, 1 due to sepsis, 1 due to progressive insufficiency of cardiopulmonary function.

## Conclusions

1. The statistical difference of bowel function recovery after the small intestine resection is insignificant from the large intestine resection but the patients, who had the small intestine segmental resection, started defecating sooner.

2. By performing cytoreductive ovarian cancer operations, bowel resections were necessary to about one-fifth of all patients.

3. Repetitive surgeries due to postoperative complications after cytoreductive ovarian cancer operations including bowel resections are rare.

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## KNOWLEDGE OF HUMAN PAPILLOMAVIRUS AMONG STUDENTS IN SECONDARY SCHOOLS OF KAUNAS CITY

*Eglė Aišporaitė, Aurelija Siratavičienė*

*Supervisor of the abstract: Kristina Jarienė, Augusta Petrušaitė*

*Department of Obstetrics and Gynecology, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

### Introduction

It is well known that cervical cancer is induced by oncogenic human papillomavirus (HPV). Cervical cancer is the fourth leading cause of cancer death among women worldwide, while HPV is thought to be the most common sexually transmitted infection. Cervical cancer is now a preventable disease due to prophylactic vaccine and screening programs, still a lot of young people do not know anything either about HPV infection, either about vaccination.

### Aim

To investigate the knowledge about HPV of secondary schools students in Kaunas.

### Objectives

1. To investigate students' knowledge about HPV and related diseases.
2. To assess students' knowledge about HPV vaccine.
3. To determine the source of information about HPV vaccine.
4. To learn students attitude to the vaccination.

### Methods

32 of 36 Kaunas schools agreed to participate in this study. 11th and 12th grade students were surveyed by an anonymous questionnaire about HPV in November 2014 - February 2015. 3414 questionnaires were distributed, 2580 – analysed. The response rate – 75.6%. Statistical analysis of the data was performed using Microsoft Office Excel, „SPSS 22.0“ programs and Pearson correlation coefficient,  $\chi^2$ , Student's t-tests. Results were considered statistically significant when p value was < 0.05.

### Results

1146 males (44.4%) and 1434 females (55.6%) responded, with an age average of  $17,35 \pm 0,69$ . 1247 (48.3%) of responders claimed to know about HPV, while correct knowledge was observed in only 40%. 1521 (59%) of respondents thought the virus to be sexually transmitted, 60.3% and 39.7% of female and male respectively, 1013 (39.3%) knew nothing about getting infected to the virus, 49.8% and 50.2% respectively. 2021 (78.3%) thought the virus to be transmitted by both genders, 60.1% and 39.9% of female and male respectively, 247 (9.6%) didn't know the ways of transmission, 44.9% and 55.1% respectively, 190 (7.4%) thought HPV is transmitted by woman (33.6% and 76.4%), 109 (4.2%) - by men, 62.3% and 37.7% respectively.

Students stated the HPV to be the causes of genital inflammation, cervical cancer, genital warts, flu-like symptoms and urinary infections, 1096 (42.5%), 772 (29.9%), 464 (18.0%), 461 (17.9%) and 318 (12.3%) respectively. 696 (27%) didn't know any diseases HPV is responsible for.

Only 614 (23.8%) of students have heard about HPV vaccine, 64.5% and 35.5% of female and male, respectively. The main information sources were internet 242 (39.3%) and doctors 182 (29.5%), the rarest – parents 66 (10.7%).

1740 (67.4%) of responders didn't know the purpose of the vaccine against HPV. Responders thought the vaccine to give the protection against sexually transmitted diseases, cervical cancer, flu and pregnancy, 472 (18.3%), 350 (13.6%), 130 (5.0%) and 29 (1.1%) respectively.

668 (25.9%) of all responders would like to be vaccinated, 607 (23.5%) would not, 34 (1.3%) were vaccinated already, 22 (0.9%) of them had never been vaccinated at all. 1249 (48.8%) doubt about vaccination. The reason why the students don't want to be vaccinated is the lack of knowledge about the virus and the vaccine. 1595 (61.8%) of students want to get more information about HPV, 62.2% and 37.8% of female and male respectively, 392 (15.2%) – don't want, 38.2% and 61.8% respectively. 1392 (54%) of students want to get information from doctors, 913 (35.4%) from teachers, 396 (15.3%) from parents.

### Conclusions

1. Almost half of the respondents claimed to know about HPV, but only 40% of them had the correct knowledge about it.
2. Nearly every fourth student has heard about the HPV vaccine, but more than 2/3 of them did not know what it's purpose.
3. The main information sources about HPV was internet, the rarest – parents.
4. Nearly every second student was not sure about the need of vaccination, the main reason for that is the lack of information.

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## NUTRITION CHANGES AMONG PREGNANT WOMEN

*Diana Uljanionok*

*Supervisor of the abstract: Justina Kačerauskienė*

*Department of Obstetrics and Gynecology, Lithuanian University of Health Sciences, Lithuania*

### Introduction

During pregnancy a lot of women gain excessive weight and have inadequate nutrition. Most of them do not receive information they need to make healthy behavior changes [1].

### Aim

The aim of the study was to determine nutrition changes among Lithuanian pregnant women.

## Objectives

1. To determine the impact of practitioner cared to pregnant women, demographic characteristics, and sufficiency of information about healthy nutrition on choosing nutrition during pregnancy.
2. To compare nutrition before and during pregnancy

## Methods

The study was performed at The Departments of Obstetrics and Gynecology, at the Lithuanian University of Health Sciences and Vilnius city clinical hospital from October to December in 2014. 279 randomly selected women were asked to fill in an original, anonymous questionnaire. 35 women were excluded from the study because of: diabetes mellitus, gestational diabetes and if body mass index (BMI) before pregnancy was more than 25. 15 questionnaires were given back unfilled. Therefore, 229 questionnaires were analyzed. The content of questionnaire was: 1) demographic characteristics (maternal age, parity and residence), 2) information about nutrition changes before and during pregnancy (nutrition information recourses and nutrition habits before and during pregnancy according to food-based dietary guidelines in Europe). For statistical analysis ToolPak "Excel for Windows 2007" and "SPSS 20.0" was used. To qualitative data comparison chi-squared test was applied. Data differences were statistically significant, when  $p < 0.05$ .

## Results

The mean age of women was 29.2 years. An average BMI before pregnancy was  $21.77 \pm 0.45$  kg/m<sup>2</sup>. 54.6% of respondents were primiparous and 45.4% were multiparous. 75.98% of women were from urban, while 24.02% from rural areas. According to the healthy habits (food-based dietary guidelines in Europe) only 4.46% of our respondents were eating healthy, 29.01% were eating well and 67.53% were eating unhealthy before pregnancy. 65.07% of women improved their nutrition habits during pregnancy and limited unhealthy- junk food. During pregnancy 6.11% of women started eating healthy, 41.48% were getting right nutrition and 52.41% were eating unhealthy. 68.39% of women from urban and 54.54% of women from rural areas changed their eating habits after becoming pregnant. Women from urban areas during pregnancy started eating healthier, than women from rural areas ( $p < 0.05$ ). Other demographic characteristics did not have an impact on choosing nutrition during pregnancy. During pregnancy 90.63% of women chose obstetricians and gynecologists care to them, 9.17% of women chose family physicians and none of them chose midwife. There is no statistically significant correlation between who cared pregnancy and healthy eating. Women who discussed their nutrition with obstetricians and gynecologists did not eat healthier ( $p = 0.69$ ). Information of nutrition behavior was discussed in less than half of cases (48.03%). There is no statistically significant correlation ( $p = 0.06$ ) between the presence of physician nutrition counseling and healthy eating. Women who discussed their nutrition with their doctors did not eat healthier, than women who were not consulting anyone regarding their nutrition ( $p = 0.97$ ). 57.21% of respondents had enough information about healthy eating. They significantly were eating healthier ( $p < 0.05$ ) than those who lacked information. Women who did not have enough information about nutrition were searching for extra information on the internet – 25.76%, in magazines and newspapers – 15.72%, consulted with their mother – 10.92% and consulted with their friends – 2.18%. 45.42% were not searching for extra information at all. During pregnancy, 16.59% of women gained from 5 to 9 kg of weight, 10.93% gained 10 -11 kg, most of them (48.03%) gained 12-16 kg, 11.79% - 17-19 kg and 12.66% more than 18 kg. There is statistically significant difference between the presence of physician nutrition counseling and the amount of weight gain. Women, who were not discussing their nutrition behavior with their physician, gained more weight ( $p = 0.008$ ). Majority of pregnant women reported taking folic acid (81.22%), 53.28% were taking iron and 16.16% - vitamin D supplements. In addition, 48.03% of participants reported taking multivitamin. In most cases (62.88%) supplements were recommended by obstetricians and gynecologists, 14.41% were recommended by family doctors and in other cases (22.71%) women decided on their own.

## Conclusions

1. Obstetricians and gynecologists, as well as family physicians are not always providing adequate counseling on nutrition. The specialty of practitioner who cared to pregnant women had no impact on nutrition changes. Nutrition changes to healthy eating were influenced by living in urban area and having enough information about nutrition.

2. More than half of women improved their nutrition behavior during pregnancy, but still half of women during pregnancy were eating unhealthy.

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## PECULIARITIES OF THE CLINICAL FEATURES AND LABORATORY FINDINGS OF THE OVARY HYPERSTIMULATION SYNDROME

*Simona Juciūtė, Austė Kabašinskiė*

*Supervisor of the abstract: Eglė Drejerienė*

*Department of Obstetrics and Gynaecology, LSMU, Lithuania*

#### Introduction

Ovarian hyperstimulation syndrome (OHSS) is a rare but life-threatening syndrome which is usually an iatrogenic complication of ovulation induction. When ovaries are stimulated, target organs are affected and life-threatening ovarian hyperstimulation syndrome might occur. OHSS follows enlargement of ovaries with multiple cysts, hemoconcentration, ascites, pleural and pericardial effusions. In Kaunas Hospital of Lithuanian University of Health Sciences (LSMU), Obstetrics and Gynaecology Department OHSS is classified by Navot classification.

#### Aim

Assessment of peculiarities of clinical features and laboratory tests results of the ovarian hyperstimulation syndrome for women, treated in Kaunas Hospital of Lithuanian University of Health Sciences (LSMU), Obstetrics and Gynaecology Department during year 2006-2013.

#### Objectives

1. To assess the differences in complaints between patients with mild/moderate and severe/critical ovarian hyperstimulation syndrome.
2. To analyse whether there were differences in clinical features in the mentioned groups.
3. To assess dynamics of laboratory values in different OHSS groups during the treatment.

#### Methods

The retrospective data analysis is of the women, treated for OHSS in Kaunas Hospital of Lithuanian University of Health Sciences (LSMU), Obstetrics and Gynaecology Department during year 2006-2013. Medical records were selected according to the disease code TLK – 10 - AM N 98.1. In this analysis peculiarities of clinical features and laboratory findings were analysed. If laboratory values were approaching to normal while comparing first and last sample results, it would be considered as positive dynamics. The patients were divided into two groups according to the grade of OHSS: patients with mild/moderate (group 1) and severe/critical (group 2) ovarian hyperstimulation syndrome. A statistical data analysis was performed via SPSS 17.0. Data was considered to be statistically significant when  $p < 0,05$ .

#### Results

39 cases of OHSS were analysed (2 patients were treated for two times). Average age was  $30,5 \pm 4,3$  years, BMI  $22,7 \pm 3,4$ . There were 1 (2,6%) mild, 10 (25,6%) moderate, 24 (61,5%) severe and 4 (10,3%) critical OHSS cases. Complaints of all patients were as follows: 32 (82,1%) patients had abdominal discomfort, 27 (69,2%) stomach ache, 19 (48,7%) shortness of breath, 13 (33,4%) nausea, 9 (23,1%) vomiting, 3 (7,7%) diarrhoea, and 7 (17,9%) weakness. Group 2 patients were complaining for nausea more frequently ( $p < 0,05$ ).

During the objective examination 32 (82,1%) patients from both groups showed weight gain, 3 (7,7%) fever and 31 (79,5%) ascites. There were no differences in clinical characteristics between the groups ( $p > 0,05$ ). 3 (7,7%) patients from group 2 had oliguria, 2 (5,1%) edemas, 3 (7,7%) hydrothorax and 1 (2,6%) hydropericardium.

The following laboratory findings were assessed during the treatment: haematocrit, leukocytes, albumin, creatinine, potassium. Creatinine and albumin levels were normal in mild and moderate OHSS while severe and critical OHSS patients had all findings abnormal. Patients with a severe OHSS showed a positive dynamics in all laboratory results ( $p < 0,05$ ).

### Conclusions

1. Patients with a severe/critical ovarian hyperstimulation syndrome were complaining for nausea more frequently.
2. During the objective examination there were no differences in detected clinical characteristics in all grades of OHSS.
3. During treatment positive dynamics were noticed in haematocrit, leukocytes and potassium blood sample values in all grades of OHSS.

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## PECULIARITIES OF TREATMENT OF THE OVARIAN HYPERSTIMULATION SYNDROME

*Simona Juciūtė, Austė Kabašinskiė*

*Supervisor of the abstract: Eglė Drejerienė*

*Department of Obstetrics and Gynaecology, LSMU, Lithuania*

### Introduction

One of the most serious complications of ovarian stimulation is ovarian hyperstimulation syndrome (OHSS). OHSS refers to a combination of ovarian enlargement due to multiple ovarian cysts and an acute fluid shift out of the intravascular space. It is a potentially life-threatening syndrome, because such complications as hypovolemia, liver or renal failure, tromboembolic events, respiratory distress syndrome can occur. So management of OHSS can be complicated and require high - skilled team of professionals.

Only severe and critical grade of OHSS should be treated in hospital. Patients with mild and moderate OHSS can be followed – up and treated as outpatient.

### Aim

To assess peculiarities of treatment of OHSS for women, treated in Kaunas Hospital of Lithuanian University of Health Sciences (LSMU), Obstetrics and Gynaecology Department during year 2006-2013.

### Objectives

1. To evaluate the peculiarities of the conservative treatment;
2. To analyse the strategy of the invasive treatment;
3. To assess the duration of the treatment.

### Methods

The retrospective data analysis is of the women, treated for OHSS in Kaunas Hospital of Lithuanian University of Health Sciences (LSMU), Obstetrics and Gynaecology Department during year 2006-2013. Medical records were selected according to the disease code TLK – 10 - AM N98.1. In this trial peculiarities of conservative and invasive

treatment, duration of treatment were analysed. The respondents were grouped according to the grade of OHSS: patients with mild/moderate (group 1) and severe/critical (group 2) ovarian hyperstimulation syndrome. To classify into the grades we used Navot classification, based upon the severity of symptoms, signs, and laboratory findings. The received data was processed via statistics program SPSS 17.0. Data is statistically significant when  $p < 0,05$ .

## Results

The following grades were noticed in terms of 39 cases of the disease: 1(2,6%) mild, 10 (25,6%) moderate, 24 (61,5%) severe, 4 (10,3%) critical.

Only conservative treatment was applied for 25 (64,1%) patients, including 11 (44,0%) severe OHSS cases and 2 (8,0%) critical. Albumin infusion was applied for 22 (56,4%) women with an average content of  $680,95 \pm 810$  ml. Crystalloid infusions were applied for 34 (87,2%) patients, volemic solutions for 6 (15,4%). 32 (82,1%) patients were treated with low molecular weight heparin, 2 (4,7%) with diuretics and 3 (7,7%) with antibiotics. Only conservative treatment was statistically more frequently applied for patients from group 1, comparing to group 2. Invasive procedures were applied for 14 (35,9%) patients. Between them there were 12 patients with severe OHSS and 2 critical cases. Ascites was found in 35 (89,7%) cases, including 12 (34,3%), which required paracentesis. An average number of punctured fluid during paracentesis was  $3466,67 \pm 1554$ . In case of hydrothorax, pleura puncture was applied for 3 (7,7%) patients. One patient suffered from acute renal failure, which required 4 times of hemodialysis. The statistically significant frequency of invasive procedures was shown for the patients from group 2, comparing to group 1. Stationary course of treatment was averagely for  $10,1 \pm 7,87$  days. Treatment of patients with severe and critical OHSS took ( $13,34 \pm 7,3$  days) statistically significantly longer comparing to those who had mild or moderate ( $4,64 \pm 4,1$  days).

## Conclusions

1. Patients with a mild and moderate OHSS were treated conservatively.
2. Invasive procedures were applied more frequently for patients with severe or critical OHSS;
3. A longer duration of treatment was noticed for patients with severe or critical OHSS.

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## PREGNANCY RISK FACTORS AND PLACENTA PRAEVIA OUTCOMES

*Julius Bartašius, Rūta Damoškaitė*

*Supervisor of the abstract: Laura Malakauskienė*

*Department of Obstetrics and Gynecology, LSMU, Lithuania*

### Introduction

Placenta praevia is a condition when placental tissue extends over or lies proximate to the internal cervical os [1]. Well known risk factors for placenta praevia are previous caesarean deliveries, multiparity, older maternal age, previous induced abortion, maternal smoking [2, 3]. Placenta praevia increases the risk of antepartum, intrapartum, and postpartum hemorrhage. For this reason, women with placenta praevia are more likely to undergo surgical hemostasis during delivery (suturing placental site, Lynch suture and other) or postpartum hysterectomy [4]. The aim of our study is to determine the association of risk factors and placenta praevia complications.

## Aim

To evaluate association between pregnancy risk factors and outcomes of placenta praevia.

## Objectives

1. To evaluate association of abnormal placentation and pregnancy risk factors: maternal age, smoking, previous induced abortions, previous deliveries and caesarean sections.
2. To evaluate association of risk factors and surgical hemostasis.
3. To evaluate association of risk factors and hysterectomy.

## Methods

The retrospective data analysis of 226 women with placenta praevia, who delivered in Kaunas Hospital of Lithuanian University of Health Sciences (LSMU) during year 2004 – 2013. Associations between risk factors and outcomes of placenta praevia were evaluated. The included risk factors were: maternal age, multiparity, previous caesarean sections, smoking, previous induced abortions. The assessed outcomes of placenta praevia were abnormal placentation (placenta accreta, increta, percreta), need of surgical hemostasis during delivery, need of hysterectomy after delivery. Significance of data was evaluated using  $\chi^2$  test, Mann-Whitney test and Student's t-test. Results were considered statistically significant when p value was below 0,05.

## Results

There were 226 women with placenta praevia who gave birth in Kaunas Hospital of LSMU Department of Obstetrics and Gynecology in 2004 – 2013 years. Mean age of these women was  $31,66 \pm 5,62$  and they gave birth averagely  $2,54 \pm 1,50$  times in the past. Among these women 23,5% (n = 53) had previous caesarean section (CS), 28,3% (n = 64) had previous induced abortions and 16,8% (n = 38) were smoking during pregnancy. Abnormal placentation was found in 12,8% (n = 29) of cases. Surgical hemostasis was needed for 26,5% (n = 60) patients and hysterectomy was performed to 3,1% (n = 7) patients.

In a group of patients with abnormal placentation mean age was  $33,07 \pm 4,317$  and mean number of giving births was  $2,48 \pm 0,99$ , while in a group with normal placentation mean age –  $31,46 \pm 5,76$ , mean number of giving births –  $2,54 \pm 1,56$ . These differences were not statistically significant ( $p > 0,05$ ). The mean number of previous CS in an abnormal placentation group was  $1,56 \pm 0,63$  and it statistically significant ( $p = 0,031$ ) differs from the group of normal placentation, –  $1,24 \pm 0,55$ . Smoking and previous induced abortions had no influence on placentation ( $p > 0,05$ ).

Mean age of women who needed surgical intervention for management of postpartum hemorrhage was  $33,2 \pm 4,69$ , while younger patients (mean age  $31,1 \pm 5,83$ ) statistically significant ( $p = 0,008$ ) did not require interventions. Women who underwent surgical bleeding treatment had more CS, average  $1,50 \pm 0,66$ , and had  $2,55 \pm 1,03$  previous deliveries. Those who did not need surgical interventions for postpartum hemorrhage had average  $1,21 \pm 0,49$  CS and average  $2,53 \pm 1,64$  previous deliveries. These differences are not statistically significant ( $p > 0,05$ ). Smoking and previous induced abortions had no influence on need of surgical management ( $p > 0,05$ ).

Patients who underwent hysterectomy had more CS in the past ( $1,86 \pm 0,69$ ), than those who have not had hysterectomy ( $1,26 \pm 0,54$ ). This difference is statistically significant ( $p = 0,035$ ). Women who underwent hysterectomy were averagely  $34,7 \pm 3,59$  years old and gave birth averagely  $2,85 \pm 0,69$  times. Those who have not had hysterectomy were averagely  $31,57 \pm 5,65$  years old and gave birth averagely  $2,53 \pm 1,52$  times. There were no statistically significant differences ( $p > 0,05$ ). Smoking and previous induced abortions had no influence on need of hysterectomy ( $p > 0,05$ ).

## Conclusions

1. Maternal age, number of previous deliveries, smoking and previous induced abortions have no influence on abnormal placentation, while higher number of previous CS increases possibility of abnormal placentation.
2. Number of deliveries, previous CS, smoking and previous induced abortions do not increase demand of surgical intervention for management of postpartum hemorrhage, while maternal age is the significant risk factor.
3. Maternal age, number of previous deliveries, smoking and previous induced abortions do not determine need of hysterectomy after labor, while number of previous CS increases need of hysterectomy.

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## THE COMPARISON OF PREMATURE BIRTH RESULTS BETWEEN THE GROUPS OF 22ND-30TH AND 31ST-36TH+6D. GESTATIONAL WEEKS

*Gediminas Brazaitis, Ieva Povilaitė*

*Supervisor of the abstract: Tomas Biržietis*

*Department of Obstetrics & Gynaecology, LSMU, Lithuania*

### Introduction

A premature birth is almost always associated with worse life expectancy of a child and the need for a more intensive care [1,2]. It gets worse the earlier the child is born [2,3]. Therefore, it is essential to know whether there is a significant difference between earlier (22-30w) and later (31-36+6w) childbirths, evaluating both, the state of the mother and the newborn.

### Aim

To compare the labor outcomes of the mother and the child in 22-30w and 31-36+6w premature childbirths

### Objectives

1. To evaluate the difference in pregnancy and labor complication rates between the earlier (22-30w) and later (31-36+6w) premature birth groups.
2. To find out if increasing gestational week, improves the outcomes of the pregnancy and labor.
3. To determine which group has better outcomes for the baby: evaluating Apgar score and weight.

### Methods

A retrospective analysis of 100 medical records from year 2014 (50 in 22-30week group and 50 in 31-36+6) has been undertaken. All of the women have given birth in the Lithuanian university of health sciences Kaunas clinics, clinic of Obstetrics & gynecology. The sample has been chosen using the database search, assigning random (every 10th) patient from the required gestational age groups. The following data has been recorded: Mother complication rates, gestational week, newborn's Apgar score and birthweight. Then the results have been categorized and analyzed using SPSS 20.0, performing descriptives, frequencies, cross-tabs with chi-square test & Pearson correlation. The statistical significance rate of  $p < 0,05$  has been chosen.

### Results

1. In the group of 31-36+6w. premature births, 7 (14,2%) had preterm water break., 1 (2%) had colonisation with BGS, 2 (4%) had pregnancy cholestasis, 3 (6,1%) had preeclampsia gravis, 1 (2%) had I type diabetes, 1 (2%) had acute pyelonephritis, 1 (2%) had aggravated obstetric anamnesis and 33 (67,3%) had more than one complication. In the group of 22-30w premature births, 5 (10%) had preterm water break. and 45 (90%) had more than one complication. The 22-30week preemie group had worse results, although – scientifically insignificant ( $p = 0,975$ ).
2. On the average, group 31-36+6w had  $34,28 \pm 1,55$  gestational weeks, the group of 22-30w had  $26,96 \pm 2,54$  gestational weeks. It has been found out that the increasing gestational weeks in 31-36+6w increase the birthweight (pearson 0,672,  $p = 0,01$ ), while the increasing gestational weeks in 22-30w group, increase the birthweight (pearson

0,766,  $p = 0,011$ ) and the Apgar score (pearson 0,506,  $p = 0,013$ ).

3. In group 31-36+6w, average Apgar score was  $8,16 \pm 1,49$  points and average birthweight –  $2315,18 \pm 608,32g$ , while in the group of 22-30w, the average Apgar score was  $5,84 \pm 1,98$  points and the average weight was  $1062,92 \pm 401,25g$ . The higher Apgar score ( $p = 0,120$ ) and weight ( $p = 0,247$ ) has been in the 31-36+6w group, although both results were statistically insignificant.

### Conclusions

1. There are no significant mother pregnancy and labor complication rate differences.
2. It has been found out that increasing gestational week increases weight in both groups and Apgar score in the 22-30week premature group.
3. There is no significant difference of Apgar score and birthweight between the 22-30 week and 31-36+6 week group.

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## THE PROPERTIES OF PREGNANCY AND LABOR IN 18-34 YEAR OLD WOMEN, HAVING NOT THEIR FIRST CHILD

*Gediminas Brazaitis, Marija Sabaliauskaitė*

*Supervisor of the abstract: Sonata Barilienė*

*Department of Obstetrics & Gynecology, LSMU, Lithuania*

### Introduction

The successful growth of a population is associated with better social care and higher living standards. Ironically, the modern-life welfare also reduces the willingness of women to have more than one child [1]. Some base their fears on the impact to their health state that another child could cause [1,2]. Therefore, it became necessary to find out the outcomes of the second and further pregnancies & labors and the possible relationship with female health and anthropometric characteristics [2,3].

### Aim

To fully evaluate the pregnancy of 18-34 year-old women, having not their first child

### Objectives

1. To determine if there's an increase in use of caesarean section with age.
2. To find the relationship between the height, weight and BMI of women with the outcomes of pregnancy and labor.
3. To find out how the woman's chronic diseases and smoking, alcohol consumption influence the outcomes of pregnancy and labor.

### Methods

A retrospective analysis of 58 medical records from year 2010-2012 has been undertaken. All of the women were of normal age (18-34 years old) and have given birth of a second child and higher in the Lithuanian university of health sciences, Kaunas clinics, clinic of Obstetrics & gynecology. The sample has been chosen using the archive labor

records, randomly choosing every 10th patient that fit the requirements. The following data has been recorded: mother's age, height, weight, the method of childbirth, woman's smoking, alcohol consumption, chronic diseases, complications during labor and newborn's Apgar score, birthweight. Then, the the data has been processed using SPSS 20.0, performing descriptive analysis, frequencies, cross-tabs (chi-square test), ANOVA and Pearson's correlation. The significance rate of  $p < 0,05$  has been chosen.

## Results

1. In the researched group of women, 45 (77,6%) have given birth naturally and 13 (22,4%) via caesarean section. There is no statistically significant correlation between the age of the women and the use of caesarian section (0,214;  $p = 0,415$ ).
2. The average weight has been  $76,95 \pm 12,94$ kg, average height  $1,68 \pm 0,07$ m and average BMI has been  $27,24 \pm 3,99$ kg/m<sup>2</sup>, average child weight  $3577,6 \pm 235,0$ g, average Apgar score  $9,11 \pm 1,41$  points, average bed-stay  $5,14 \pm 3,81$ d. The woman complications during pregnancy were distributed the following way: 46 (79,3%) didn't have any, 2 (3,4%) developed anaemia, 2 (3,4%) had hypertensia gravidarum, 1 (1,7%) had HELLP, 1 (1,7%) developed pyelonephritis, 2 (3,4%) developed cholestasis, 2 (3,4%) had preterm breaking waters, 1 (1,7%) had more than one complication. The choice of anaesthesia has been the following: 35 (60,3%) had no anaesthesia, 2 (3,4%) had local anaesthesia, 8 (13,8%) had epidural anaesthesia, 11 (19,0%) had spinal anaesthesia, 2 (3,4%) had general anaesthesia. The weight, height and BMI had no impact on woman's complications, choice of anaesthesia, child's birthweight and Apgar score (All of Pearson correlation values  $p > 0,05$ ).
3. The women of this group had the following chronic diseases: 46 (79,3%) had none, 1 (1,7%) had bronchial asthma, 1 (1,7%) had epilepsy, 1 (1,7%) had cancer, 3 (5,2%) had cardiac diseases, 1 (1,7%) had blood disease, 1 (1,7%) had cataracts, 1 (1,7%) had tracheal stenosis, 3 (5,2%) had more than one chronic condition. Also, 56 (96,6%) of them claimed to abstain from drinking alcohol and smoking during pregnancy, 2 (3,4%) admitted smoking and drinking alcohol during pregnancy. The hazardous habits of smoking and alcohol drinking had no significant impact ( $p > 0,05$ ), while the chronic diseases had a positive correlation of 0,539 with increasing bedstay ( $p = 0,01$ ).

## Conclusions

- 1.The frequency of caesarean section is not affected by the age of the pregnant woman.
- 2.Height, weight and BMI don't affect the outcomes of labor and pregnancy.
- 3.Woman's chronic diseases increase the duration of bed-stay and the alcohol consumption & smoking do not affect the outcomes of birth and labor.

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# **ODONTOLOGY & MAXILLOFACIAL SURGERY SESSION**

# ANTIMICROBIAL POTENTIAL OF PLATELET RICH FIBRIN

*Ignas Zibartas*

*Supervisor of the abstract: Gintaras Janužis*

*Department of Maxillofacial surgery, LSMU, Lithuania*

## Introduction

In recent years the application of platelet rich plasma to enhance bone regeneration and soft tissue maturation has increased in oral and maxillofacial surgery[1]. Current evidence suggests that platelet contribute many functions in antimicrobial host defense, including their ability to release potent antimicrobial peptides[2]. There are studies proving platelet rich plasma antimicrobial effect. The hypothesis was raised that platelet rich fibrin should also have antimicrobial potential.

## Aim

To investigate antimicrobial potential of platelet rich fibrin (PRF).

## Objectives

1. To evaluate platelet rich fibrin antimicrobial effect against *Escherichia coli* (ATCC 25922), *Enterococcus faecalis* (ATCC 29212), *Pseudomonas aeruginosa* (ATCC 27853), *Staphylococcus aureus* (ATCC 25923), *Streptococcus pneumoniae* (ATCC 49619), *Candida albicans*.
2. To compare platelet rich fibrin antimicrobial effect between different bacteria and fungi species.
3. To evaluate antimicrobial effect of a membrane made of platelet rich fibrin.

## Methods

Systemic literature review was performed in PubMed data bases. According to the present studies of antimicrobial potential of platelet rich plasma, these bacteria and fungi were chosen: *Escherichia coli* (ATCC 25922), *Enterococcus faecalis* (ATCC 29212), *Pseudomonas aeruginosa* (ATCC 27853), *Staphylococcus aureus* (ATCC 25923), *Streptococcus pneumoniae* (ATCC 49619), *Candida albicans*[3-8] The permission of LSMU bioethics center (No. BEC-OF-487) was received for a study. Healthy volunteers LSMU students agreed to donate 54mL of venous blood each. Blood samples then were spinned for 12 minutes at 2800 rotations per minute. Leucocyte – platelet rich fibrin was obtained. Six 10 millimeter in diameter platelet rich fibrin discs was prepared in „PRF&GRF box“ (OSUNG MND Co.) from each patient and placed on Muller-Hinton agar with standard number of bacteria (0.5 according to McFarland turbidity test). Antimicrobial effect was measured by Well technique in 18-24 hours. Statistical analysis was performed using IBM SPSS 22.0, nonparametric tests. Level of significance  $\alpha = 0.05$ .

## Results

Platelet rich fibrin has significantly reduced growth of *Enterococcus faecalis* and *Candida albicans* ( $p < 0,05$ ). It also reduced growth of *Staphylococcus aureus* and *Escherichia coli*. Platelet rich fibrin had no effect against *Streptococcus pneumoniae* and *Pseudomonas aeruginosa* after 18-24 hours of incubation( $p < 0,05$ ). The membrane made of platelet rich fibrin also has antimicrobial effect, which depends on the concentration of platelet and leukocytes. The fibrin-net part of PRF membrane did not show any antibacterial effect.

## Conclusions

1. Platelet rich fibrin has antimicrobial activity.
2. Platelet rich fibrin antimicrobial activity depends on the concentration of platelet and leukocytes.
3. Clinicians should consider using platelet rich fibrin in order to minimize the risk of infection.

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## APPLICATION OF PONT'S INDEX TO A LITHUANIAN POPULATION: A PILOT STUDY

*Agneška Rykman*

*Supervisor of the abstract: Dalia Smailienė*

*Department of Orthodontics, LSMU, Lithuania*

### Introduction

A variety of diagnostic indices in orthodontics have been proposed to help in diagnosis and treatment planning. Malocclusion can be treated with extraction or non-extraction approaches. Among non-extraction methods arch expansion is most commonly suggested. The shape and width of dental arch is individual for each patient. It has to be taken into consideration while planning orthodontic treatment and post orthodontic retention. One of the methods to evaluate necessary width of dental arch is Pont's Index. Pont's index was established in 1909 to predict ideal maxillary dental arch width from the sum of mesiodistal widths of four upper incisors of the French population. Pont suggested that index should be applied to different ethnic groups for verification or correction.

### Aim

The aim of this study was to assess the applicability of Pont's Index to a Lithuanian population and to compare the results with studies of other ethnic subjects.

### Objectives

1. To evaluate the correlation between measured dental arch widths with those calculated according to Pont.
2. To compare the results with studies of other ethnic subjects.

### Methods

— The sample comprised 52 subjects (32 females and 20 males) with age range from 18 to 35 years (mean age 25.19 ± 4.45). Dental casts were selected from 4th year students of Dentistry and from Twin Study of Lithuanian university of Health Sciences. Criteria of inclusion: Angle normal occlusal relationship with normal overbite (1- 4 mm) and overjet (1-3 mm); no visible restorations; no history of any kind of orthopedic or orthodontic treatment; no anomalies in teeth form, number, alignment.

— Measurements were obtained directly from plaster casts using a digital caliper (accuracy 0.01 mm); they included mesiodistal crown diameters of the four maxillary incisors, interpremolar and intermolar maxillary and mandible dental arch widths as specified by Pont. The landmarks used for measurements were as follows:

- Maxillary: interpremolar width: central groove on the occlusal surface of first premolar; intermolar: mesial pit on the occlusal surface of first molar;
- Mandible: interpremolar width: contact point between first and second premolars; intermolar: tip of distobuccal cusp.
- To determine the errors associated with cast measurements, 15 cast models were randomly selected. Their measurements were repeated by the same observer 2 weeks after. The mean errors calculated using Dahlberg's formula ranged from 0.09 mm to 0.16 mm for tooth width and from 0.13 mm to 0.47 mm for arch width measurements. These findings indicated that experimental errors were generally small and unlikely to bias the results.
- Incisor and arch widths were recorded for each subject to the nearest 0.01 mm and described in terms of average values (AVG), standard deviations (SD), and coefficients of variation (CV). Arch widths were calculated for each subject according to Pont's formulae, and the correlation coefficients were calculated between the measured and the calculated arch width values.
- All statistical analyses were performed using the Statistical Package of Social Sciences (Windows, Version 16.0, SPSS Inc., Chicago, Illinois, USA). The statistical method used was Student's two-tailed test and Pearson analysis.

### Results

- The AVG of mesiodistal width of 4 upper incisors was 30.52 mm (SD 1,86; CV – 0.06).
- According to Pont formula the expected AVG of interpremolar width was 38.15 mm (SD 2.32; CV – 0.06), while this study indicated a value of 35.66 mm (SD 2.36; CV – 0.07) in maxilla and 34.51 mm (SD 2.57; CV – 0.07) in mandible. Correlation coefficients between the measured interpremolar width values and the corresponding values calculated according to Pont's Index were moderate in all cases, with r values ranging from 0.59 (mandible) to 0.64 (maxilla) ( $p < 0.05$ ).
- According to Pont formula the expected AVG of intermolar width was 47.71 mm (SD 2.88; CV – 0.06), while this study indicated a value of 46.07 mm (SD 2.67; CV – 0.06) in maxilla and 46.78 mm (SD 3.15; CV – 0.07) in mandible. Correlation coefficient between the measured intermolar width values and the corresponding values calculated according to Pont's Index were moderate in all cases, with r value 0,49 ( $p < 0.05$ ) in both maxilla and mandible.

### Conclusions

1. According to the results of this study, there was no strong evidence to suggest that Pont's Index could be reliably used to predict the ideal arch width of Lithuanian individuals. Further investigations are needed.
2. The majority of studies suggest that the generalized use of Pont's index might not be valid for other populations (e.g. Turkish, Jordanian), but studies suggesting that Pont's index is applicable to other populations are present as well (Northern Indians). Findings of this study are in agreement with those reported by other investigators that Pont's index cannot provide reliable predictions for individual orthodontic treatment planning.

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# COMPARATIVE CHARACTERISTIC OF EXPERIMENTAL ANIMALS USED FOR BONE AUGMENTATION RESEARCH

*Donatas Nomeika, Taimonas Mažeika*

*Supervisor of the abstract: Gintaras Janužis*

*Lithuanian University of Health Sciences, Lithuania*

## Introduction

Alveolar process is one of the most resorbable bone structure in human body. In order to recreate masticatory and esthetic functions, various modern bone augmentation techniques are used. However, experiments on animal models are inevitable. Different animal species are used for this purpose which led us to an idea to systemize results of researches and compare the influence of animal species to results of experiments

## Aim

To investigate the most suitable localization for bone augmentation experiments in different animal species.

## Objectives

1. To select animal species most commonly used for bone augmentation experiments.
2. To investigate most common augmentation location for each animal species.
3. To evaluate each animal model and most suitable location for bone augmentation procedure.

## Methods

Literature review was carried in PubMed database. Following keywords were used: animal species + bone augmentation. Search filters applied: article published less than 10 years ago, non-human study. PRISMA statement criteria were used. Article excluding criteria:

1. Metal construction was used for augmentation (implantology, titan mesh, osteosynthesis plate, screw, etc.).
2. Augmentation is associated with soft tissue plastic surgery (tissue expansion, skin, muscle, tendon augmentation).
3. Location of augmentation is not provided in the article.
4. Number of samples is not provided in the article.
5. Research results are focused on cell interaction, but not on bone augmentation.
6. Research is conducted in vitro. Each experiment included in systematic review must be located in mandible, maxilla, maxillary sinus, calvaria, long bones (humerus, radius, tibia, femur) or vertebrae. From 983 articles, 158 were included in the review.

## Results

Animal species most commonly used as experimental models for research: dog, rat, monkey, goat, rabbit, pig, sheep. Results of each animal species (number of articles; successful experiments):

1. Rat. 142 articles found, 19 included in review. Location of experiment- calvaria (11; 189), mandible (4; 133) palate (1; 19), maxilla (2; 102), long bones (1; 19).
2. Dog. 133 articles found, 25 included in review. Location of experiment- mandible (22; 250), maxillary sinus (2; 24), maxilla (1; 5).
3. Rabbit. 133 articles found, 41 included in review. Location of experiment - maxillary sinus (13; 481), calvaria (16; 437), mandible (4; 113), long bones (6; 79), maxilla (1; 14).
4. Pig. 80 articles found, 17 included in review. Location of experiment – mandible (9; 100) long bones (5; 80), calvaria (2; 36), maxillary sinus (1; 17).
5. Sheep. 65 articles found, 25 included in review. Location of experiment – long bones (13; 158), maxillary sinus (8; 68), mandible (2; 23), maxilla (1; 10) frontal bone (1; 10).
6. Monkey. 382 articles found, 10 included in review. Location of experiment – mandible (6; 65), maxilla (2; 26), maxillary sinus (2; 25).

7. Goat. 47 articles found, 21 included in review. Location of augmentation – long bones (16; 122), mandible (3; 30), vertebrae (2; 23).

### Conclusions

1. Performing bone augmentation in mandible, most successful experiments were conducted using dog model.
2. Performing bone augmentation in maxilla, most successful experiments were conducted using rat model.
3. Performing bone augmentation in calvaria, most successful experiments were conducted using rabbit model.
4. Performing bone augmentation in long bones, most successful experiments were conducted using sheep model.
5. Performing bone augmentation in palate, most successful experiments were conducted using sheep model.

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## COMPARISON OF THE AMOUNT OF CELLS IN LIQUID FRACTION AND SUPERNATANT OF PLATELET-RICH FIBRIN

*Donatas Nomeika, Jevgenij Nedorezov*

*Supervisor of the abstract: Gintaras Janužis, Erika Skrodenienė  
Lithuanian University of Health Sciences, Lithuania*

### Introduction

Nowadays, the usage of liquid fraction (PRF-LF) and supernatant (PPP) of platelet rich fibrin (PRF) in bone augmentation and implantation is greatly increasing. PRF-LF is produced by pressing PRF clot. During this process PRF loses liquid part of it's volume. It is important to compare the quality and quantity of cells in both, PRF-LF and PPP.

## Aim

To examine and compare amount of cells in PPP and PRF-LF.

## Objectives

1. Assess quantity of leukocytes in PRF-LF and PPP
2. Assess quantity of platelets in PRF-LF and PPP.
3. Compare results and evaluate them.

## Methods

Permission of LSMU Bioethic center was received. 63 healthy volunteers were selected for this study. Venous blood samples were taken using PRF vacutainers, one for every volunteer (tube A, 10ml, brown). Vacutainers were centrifuged (EBA 20, Germany) instantly after the blood was taken (1500 RPM, 14 minutes). Red blood cells settle in the bottom of the tube, PRF – in the middle and PPP in the upper part. PPP was transferred into tube B (red, 5ml, without additional reagents) using automatic dispenser Finnpiquette, 0,5ml. PRF clot was separated from red blood cells using sterile instruments and then transferred into PRF extruder (Choukron's PRF & GRF Casette, France). PRF was pressed until there was only membrane left and PRF-LF has fully exudated. After that, PRF-LF was transferred into tube C (red, 5ml, without any reagents) using automatic dispenser Finnpiquette 0.5ml. Tubes B and C were analyzed using automatic hematological analyzer Sysmex XE-5000 (Sysmex Corporation, Kobe, Japan). Full blood test was carried for each tube. Statistical analysis was conducted using program – SPSS, v17.0. Student's t-test was used.

## Results

1. Quantity of leukocytes is statistically significantly greater in PRF-LF ( $1,4124 \pm 1,08 \times 10^9/l$ ) than in PPP ( $0,1424 \pm 0,29 \times 10^9/l$ ),  $p < 0,01$ .
2. Quantity of platelets is statistically significantly greater in PRF-LF ( $6,57 \pm 5,7 \times 10^9/l$ ) than in PPP ( $1,57 \pm 1,1 \times 10^9/l$ ),  $p < 0,01$ .
3. Amount of leukocytes in blood samples was between normal values ( $3,98-8,8 \times 10^9/l$ ).
4. Amount of platelets in blood samples was between normal values ( $166-308 \times 10^9/l$ ).

## Conclusions

1. PRF-LF has more blood components in its composition than PPP.
2. In the process of extrusion, PRF clot loses 16-35% of leukocytes, which are transferred into PRF-LF
3. In the process of extrusion, PRF clot loses 2,1-3,9% platelets which are transferred into PRF-LF.

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## DETECTION OF BIOCHEMICAL ALTERATIONS IN BLOOD SERUM FOR ORAL CANCER DIAGNOSTICS

*David Kasradze, Simona Žiemytė*

*Supervisor of the abstract: Ričardas Kubilius, Rasa Baniienė*

*Department of Maxillofacial surgery, LSMU, Lithuania*

### Introduction

The diagnosis of oral cancer relies on a complex approach using clinical examination, histological analysis of biopsy and radiology. Traditional diagnostic methods are not effective enough in terms of early diagnostics and detecting oral malignancies in hidden sites. Dynamic nature of circulatory system and changes in constitution of blood reflect diverse physiological and pathological states. Thousands of scientific publications have detected promising individual serum protein biomarkers. Serum biomarkers could be a valuable and minimally invasive adjunct to other methods; however they are not used in clinical practise.

### Aim

Evaluate and compare the quantitative biochemical changes of potential cancer diagnostic protein biomarkers in blood serum of patients with diagnosed oral cancer and healthy people.

### Objectives

In the blood serum samples of the patients with oral cancer and healthy people evaluate and compare:

1. Quantity of inflammatory cytokine IL-8;
2. Quantity of cell cycle regulating protein cyclin D1;
3. Quantity of matrix metalloproteinase 8 (MMP-8);
4. Quantity of calcium binding protein S100P;
5. Quantity of cytokeratin-19 fragment Cyfra 21-1;
6. Activity of lactate dehydrogenase (LDH)

### Methods

1. The approval of LSMU centre of bioethics was obtained. All the participants gave an informed consent before the study.
2. For this study 10 patients with histologically confirmed oral cancer from Department of Maxillofacial Surgery, Kaunas Clinics, Lithuanian University of Health Sciences between September, 2013 – November, 2014 were included. For control group blood samples were obtained from 13 randomly enrolled, healthy students of LSMU. Blood samples

(5 ml) were collected using steril test tubes of vacuum blood collecting system with no additives from median cubital vein.

3. The activity of LDH was estimated using NanoPhotometer Pearl spectrophotometer, measuring the changes of light absorbption at 340 nm length light wave.

4. The concentrations of proteins (TNF- $\alpha$ , Cyfra 21-1, Cyclin D1, S100P, MMP-8) were evaluated using commercial ELISA diagnostic kits.

5. Data are presented as means  $\pm$  SEM. Each point for every individual preparation averaged for two-three repetitive runs. Statistical analysis was performed using Student's t test, and  $P < 0.05$  was taken as the level of significance. Statistical analysis was performed using the software package Sigma Plot.

## Results

Our prior studies of salivary biomarkers showed promising results that allowed us to continue the analysis. We evaluated the changes of concentrations of various blood serum proteins - IL-8, cyclin D1, MMP-8, S100P, Cyfra 21-1 and activity of LDH in serum samples of patients with oral cancer and healthy controls. The results showed that concentrations of IL-8 did not differ between two study groups: oral cancer patients 0,07 ng/mg protein and healthy controls 0,12 ng/mg protein. Concentration of cell cycle regulatory protein cyclin D1 was 5 times higher in oral cancer patients compared to healthy controls; however the results were not statistically significant. Serum MMP-8 quantities were also increased in study patients. Mean concentration of MMP-8 in oral cancer patients was higher by 61% compared to control group (26,47 and 16,46 ng/mg protein respectively,  $p < 0,05$ ). Calcium binding protein S100P and Cyfra 21-1 quantities also were higher in oral cancer group compared to control by 3,5 and 1,8 times respectively. However only results of S100P protein were statistically significant. The activity of serum LDH did not differ between study groups.

## Conclusions

1. Differences of MMP-8 and S100P protein concentrations were significantly higher in oral cancer patients. These protein may be useful adjuvant serum biomarkers for diagnostics of oral cancer.
2. The concentration of IL-8 and activity of LDH in blood serum did not differ between two study groups. The quantitative changes of Cyfra 21-1 and cyclin D1 showed the tendency to be higher in oral cancer patient group. However none of these proteins were informative enough for oral cancer diagnostics.

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# DIMENSIONAL TISSUE STABILITY AFTER SOFT-TISSUE GRAFTING AROUND DENTAL IMPLANTS: A SYSTEMATIC REVIEW

*Lukas Poškevičius*

*Supervisor of the abstract: Gintaras Juodžbalys*

*Department of Maxillofacial surgery, LSMU, Lithuania*

## **Introduction**

Studies in the literature have reported that the presence of an adequate width of keratinised mucosa is required to reduce the risk of mucosal recession and alveolar bone loss around implants in the long term. Thick mucosa is associated with lesser mucosal recession, compared to a thin mucosa. The use of soft tissue volume augmentation is also indicated for aesthetic reasons and to facilitate oral hygiene. Therefore, in order to successfully treat a soft tissue defect, it is important to achieve long-term, sustainable outcomes.

## **Aim**

To systematically review soft-tissue changes after soft-tissue grafting around dental implants.

## **Objectives**

1. To evaluate long-term mucosal soft-tissue thickness and keratinised mucosa width changes after soft tissue grafting around dental implants.
2. To compare the soft tissue stability outcomes after soft tissue grafting at implant placement and around dental implants.

## **Methods**

The review was registered in PROSPERO register, the reporting of this systematic analysis adhered to the PRISMA Statement. An electronic literature search was conducted of the MEDLINE database published between 2009 and 2014. The keywords and search inquiries that were used during the primary stage were as follows: "Dental implants" AND ("Soft tissue grafting" OR "Soft tissue correction" OR "Transplantation") AND ("Stability" OR "Thickness" OR "Keratinised mucosa width" OR "Volume" OR "Survival" OR "Follow up" OR "Amount"). Sequential screenings at the title, abstract, and full-text levels were performed. Additionally, a hand search was carried out in dental implant related journals. Clinical human studies in the English language that had reported changes in soft-tissue thickness or keratinised mucosa width after soft-tissue grafting at implant placement or around a present implant at 6-month follow-up or longer were included. The Cochrane Collaboration's two-part tool for assessing risk of bias was used to assess bias across the studies and identify papers with intrinsic methodological and design flaws.

## **Results**

The initial search identified a total of 2131 articles. Following the screening of the article titles, 649 potentially relevant articles were identified. Independent screening of the abstracts resulted in the selection of 40 publications for possible inclusion. The inclusion and exclusion criteria were applied to the 40 full-text articles. Finally, 14 articles that met the predefined criteria were included in the systematic review: 6 of them reported connective tissue grafting around present dental implants, compared to 8 at the time of implant placement. Better long-term soft-tissue thickness outcomes were reported for soft-tissue augmentation around dental implants (0.8–1.4 mm), compared with augmentation at implant placement (–0.25–1.43 mm). Both techniques were effective in increasing keratinised tissue width: at implant placement (2.5 mm) or around present dental implants (2.33–2.57 mm) The quality assessment of the included studies revealed: a high risk of bias – 9, unclear risk - 4, low risk – 1 study.

## **Conclusions**

The present systematic review discovered that connective tissue grafts enhanced keratinised mucosa width and soft tissue thickness for an observation period of up to 48 months. However, some shrinkage may occur, resulting in

decreases in soft tissue, mostly for the first three months. Soft-tissue stability after a connective tissue graft around dental implants is dependent on multifactorial parameters and cannot be determined clearly by existing studies, which differ from one another.

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# DISCOVERY OF POTENTIAL SALIVARY BIOMARKERS FOR ORAL CANCER DIAGNOSTICS

*David Kasradze, Simona Žiemytė*

*Supervisor of the abstract: Ričardas Kubilius, Rasa Baniienė*

*Department of Maxillofacial surgery, LSMU, Lithuania*

## **Introduction**

Oral cancer is regarded as the fifth most common type of neoplastic malignancies worldwide. Nearly half of the cases are diagnosed in the late stages, when the 5-year survival rate is 15-50%. When detected early, the survival rate increases up to 80-90%. Currently diagnosis of oral cancer is based on clinical examination and histological analysis of suspicious tissues; however the cancer of hidden sites may remain undetected in early stages. The interest in saliva as diagnostic material is strongly increased within last 10-15 years as it has the advantages of being non-invasive and safe method. To date, more than 100 potential salivary biomarkers have been reported in scientific literature, although none of them is used in clinical practise yet.

## **Aim**

This study evaluates and compares the quantitative changes of potential cancer diagnostic protein biomarkers in saliva of patients with diagnosed oral cancer and healthy people.

## **Objectives**

To evaluate and compare in the salivary samples of the patients with oral cancer and healthy people:

1. Quantities of inflammatory cytokines: TNF- $\alpha$  and IL-8;
2. Quantity of cell cycle regulating protein cyclin D1;
3. Quantity of matrix metalloproteinase 8 (MMP-8);
4. Quantity of calcium binding protein S100P;
5. Quantity of cytokeratin-19 fragment Cyfra 21-1;
6. Activity of lactate dehydrogenase (LDH).

## **Methods**

1. Between June, 2013 – Novemeber, 2014 24 patients from Lithuanian University of Health Sciences, Kaunas Clinics, Department of Maxillofacial Surgery with histologically confirmed oral cancer were included in the study after they gave informed consent. For control group 20 random, healthy students from LSMU were enrolled. 5 ml of salivary samples were collected by spitting method early in the morning (8-9 a.m.), before patients ate or drank, in to steril test-tubes.
2. The activity of LDH was estimated using NanoPhotometer Pearl spectrophotometer, measuring the changes of light absorbtion at 340 nm length light wave.
3. The concentrations of proteins (TNF- $\alpha$ , Cyfra 21-1, Cyclin D1, S100P, MMP-8) were evaluated using commercial ELISA diagnostic kits.
4. Data are presented as means  $\pm$  SEM. Each point for every individual preparation averaged for two-three repetitive runs. Statistical analysis was performed using Student's t test, and  $P < 0.05$  was taken as the level of significance. Statistical analysis was performed using the software package Sigma Plot.

## **Results**

Primary results of the study showed that the concentration of TNF- $\alpha$  was 2,7 times significantly higher in salivary samples of cancer patients compared to control group ( $p < 0,05$ ). Further investigation was executed to determine and compare the quantities of chosen proteins - IL-8, cyclin D1, MMP-8, S100P, Cyfra 21-1 and activirty of LDH between two groups. From the study results the mean concentration of IL-8 in oral cancer patients was 10,43, whereas in control group – 4,85 ng/mg protein ( $p < 0,05$ ). The concentrations of cyclin D1 distributed similarly. In salivary samples

of oral cancer patients it was increased 2 times compared to control samples (5,87 ir 2,56 ng/mg protein respectively,  $p = 0,035$ ). The comparison of MMP-8 concentrations of two study groups showed the tendency to be higher in oral cancer patients than in control group 15,77 ng/mg protein and 8,22 ng/mg protein respectively. Quantity of calcium binding protein S100P was observed to be 1,79 times higher in cancer patients ( $p < 0,05$ ). Salivary concentrations of Cyfra 21-1 did not differ comparing two groups, while the activity of LDH was increased 3 times in the oral cancer group compared to the controls 33,82 and 11,81  $\mu\text{mol NADH}/\text{min mg protein}$  respectively ( $p = 0,035$ ).

### Conclusions

1. The differences of TNF- $\alpha$ , IL-8, cyclin D1, S100P protein quantities and LDH activity between salivary samples of oral cancer patients and control group were statistically significant. These rates indicate that mentioned proteins may be used as potential biomarkers for diagnostics of oral cancer.
2. Cyfra 21-1 concentrations in salivary samples of oral cancer patients and healthy controls were similar. The measurement of salivary Cyfra 21-1 quantity for oral cancer diagnostics is not informative.

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## EVALUATION OF MICROHARDNESS OF MINERAL TRIOXIDE AGGREGATE: ORTHO VERSUS RETRO OBTURATION IN RELATION WITH ROOT RESECTION IN VITRO

*Aigustė Minkutė*

*Supervisor of the abstract: Neringa Skučaitė*

*Department of Dental and Oral Pathology, LSMU, Lithuania*

### Introduction

Surgical access can be compromised by anatomic structures in particular clinical situations when root resection is the option of endodontic treatment. Root canals filled with Mineral Trioxide Aggregate (MTA) before surgical endodontics might be beneficial in such clinical cases. After resection of the root apex, there would be no need for retro-preparation and retro-filling, thus it would simplify surgical procedure and shorten its time. It is important to know whether MTA used as an orthograde filling material will adequately harden following the resection, and if the seal of the apical part of the root will be similar to the retrograde filling with MTA. Thus, study regarding hardness of the orthograde and retrograde filling of MTA following root resection is needed.

## Aim

Aim of the study was to identify and compare microhardness of MTA with respect to the method used to fill apical part of the root in case of root resection in vitro.

## Objectives

1. Identify and compare the MTA microhardness with respect to the distance from the root apex, when this cement is used as retro-filling;
2. Identify and compare the MTA microhardness with respect to the distance from the root apex, when the apical part of the root is filled with this cement before the root resection;
3. Compare the MTA microhardness, according to the method of filling of apical part of the root when resection procedure is performed in vitro.

## Methods

Twenty roots of freshly extracted human maxillary incisors were shaped using rotary instruments Protaper Universal (Dentsply Maillefer) till size F5 (50/05) at the apex and 2.5% NaOCl. All specimens divided into 2 groups according to the method used to fill apical part of the root with MTA (ProRoot MTA; USA): group A (n = 10) – retrograde, group B (n = 10) – orthograde. Group A: the root canals were filled with guttapercha and Adseal sealer (Meta Biomed), orifices isolated with IRM (Dentsply). Apical parts of obturated roots (3 mm) were cut off after incubation (72 h), 3mm depth retro cavities prepared by ultrasonic tips KiS-2D (Obtura-Spartan, USA) and filled with MTA. Group B: apical parts of roots (7 mm) were filled with MTA in orthograde manner; wet paper point was inserted over MTA intracanal, orifices isolated with IRM. MTA was condensed under microscope (Carl Zeiss, Germany) using Machtou hand pluggers (Dentsply) in both groups. The obturated roots were embedded into a sponge soaked with saline to simulate physiologic conditions; stored at  $37^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , 100% humidity for 72 h to allow setting of MTA. Apices of roots (3 mm) in group B were cut off after incubation; the remaining part of MTA in the canal was kept as retro-filling. The longitudinal sections of all roots were made; the Vickers microhardness test was performed at every millimetre of the obturation length of MTA. Statistical analysis included Paired Student's t-test, ANOVA, Vilkokson and Kruskal-Wallis tests.

## Results

The mean surface microhardness values of MTA retro filling (group A) were  $30,8 \pm 3,6$ ,  $30,8 \pm 3,4$  and  $28,5 \pm 3,4$  (Vickers hardness units (HV)) at the obturation length of 1mm, 2 mm and 3 mm from the root apex, respectively. No significant differences were observed between the mean values of MTA surface microhardness when comparing every millimeter of the material length in group A ( $p > 0.05$ ). The mean surface microhardness values of MTA ortho filling (group B) were  $25,2 \pm 3,3$ ,  $24,1 \pm 2,8$  and  $32,8 \pm 2,2$  (HV) at the obturation length of 1mm, 2 mm and 3 mm from the root apex after resection, respectively. When the MTA microhardness was compared within the group B (orthograde obturation), the mean value estimated at 3 mm from the root apex after resection was significantly higher than those at 1 mm and 2 mm from apex after resection ( $p < 0.05$ ). No statistically significant differences comparing microhardness of MTA between the groups were found ( $p > 0.05$ ).

## Conclusions

1. Based on the study results, MTA hardened almost uniformly through the entire obturation length when this cement was used as retro-filling;
2. MTA microhardness was not uniform through the entire obturation length when the apical part of the root was filled in orthograde method before the root resection;
3. The microhardness of MTA was not affected by the different filling methods used for obturation of apical part of the root when root resection procedure was performed under the conditions of this study.

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## INFLUENCE OF DIABETES MELLITUS TYPE 2, THYROTROPIC HORMONE AND CHRONIC STRESS ON INSULIN-1 GROWTH FACTOR AND BONE MINERAL METABOLISM

*Paulius Čereška, Ignas Antanavičius*

*Supervisor of the abstract: Gintaras Janužis, Jan Pavel Rokicki*

*Department of Maxillofacial surgery, LSMU, Lithuania*

### Introduction

People nowadays often experience episodic or long-term stress. Also the population of patients with diabetes mellitus and thyroid gland disorders is rising. In order to better understand the mechanism of bone reparation we made a hypothesis that chronic stress, diabetes and thyroxine metabolism disorders might have direct influence on bone reparation.

### Aim

Research the effect of chronic stress and thyrotropic hormone on IGF-1 and bone mineral metabolism in diabetes mellitus type 2 patients.

### Objectives

1. Determine the level of chronic stress in diabetes mellitus type 2 cases.
2. Measure the amounts of IGF-1, Ca, P and TTH in blood of diabetes mellitus type2 patients.
3. Determine the level of chronic stress in healthy patients (control group).
4. Analyse the effect of diabetes and chronic stress on concentration of TTH, Ca, P and IGF-1 in blood.

### Methods

355 patients with diabetes mellitus type 2 were enrolled in this trial and 45 subjects were used as control group. To determine chronic stress both subject groups were surveyed using HAD scale and M.I.N.I. International Neuropsychiatric Interview by Dr. David Sheehan. All subjects were divided into four groups: healthy and undergoing chronic stress (HS), healthy for whom chronic stress was not determined (HN), diabetes mellitus type 2 patients and undergoing chronic stress (DMS), diabetes mellitus type 2 patients for whom chronic stress was not determined (DMN). Levels of Ca, P, IGF-1, TTH, glycated hemoglobin in venous blood were tested in all subjects. Data was processed using Statistical Package for the Social Sciences (SPSS) 13.0 software package.

### Results

Female subjects experience stress and anxiety more frequently than male subjects. HS subject group shows lower levels of calcium in blood by 2,20-2,15 mmol/L and normal amounts of phosphorus. HN group shows normal amounts of both calcium and phosphorus in venous blood. DMN group shows normal amounts of phosphorus and calcium

levels reach the lower limit of normal values. DMN with HgA1c > 7,0 mmol/L and DMS groups both show lower levels of calcium by 2,20-2,10 mmol/L and phosphorus by 0,70mmol/L. DMS group shows elevated levels of TTH. The effect of chronic stress and diabetes on IGF-1 concentration in blood was determined. IGF-1 concentration decreases by up to 16%, Ca by 22,4%, decrease of phosphorus is statistically insignificant and concentration of TTH decreases by 18% in DMS group. Subjects without any endocrinological pathology but undergoing chronic stress show decreased levels of IGF-1 by up to 11%, Ca – 11,4%, TTH – 9,8% and P change is insignificant.

### Conclusions

1. Patients with diabetes mellitus type 2 experience anxiety, sleep disorders and depression more frequently.
2. Female subjects experience chronic stress more frequently.
3. Chronic stress reduces the amounts of calcium, TTH and IGF-1 in blood.
4. Subjects with diabetes mellitus type 2 experience chronic stress more frequently than subjects without endocrinological pathology.
5. Diabetes mellitus decreases the concentration of TTH, Ca and IGF-1 in blood.

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## INFLUENCE OF THE NARROWING OF MANDIBULAR CANAL TO COMPRESSIVE ORIGIN TRIGEMINAL NEURALGIA

*Elvinas Juzikis, Diana Šmočiukaitė*

*Supervisor of the abstract: Gintaras Janužis*

*Lithuanian University of Health Sciences Department of Maxillofacial surgery, LSMU, Lithuania*

### Introduction

Etiology of trigeminal nerve neuralgia in medical literature is very controversial and debatable [1]. It is necessary to note the theory of the compression origin, while analyzing etiology of inferior alveolar nerve damaged by neuralgia. However, there is very little information in medical literature, precisely about mandibular canal narrowing and its influence to nerve compression [2]. That is why hypothesis came up, to evaluate mandibular canal narrowing influence to trigeminal neuralgias etiopathogenesis.

## **Aim**

To find out about the influence of mandibular canal narrowing to the third branch of trigeminal nerve (TN) neuralgia.

## **Objectives**

1. To measure the width of mandibular canal (MC) in three main points (in the angle of mandible, next to the mental foramen and in the middle of those two points) within three test groups and the narrowest point of the canal, also, to evaluate averages of constrictions.
2. To evaluate the correlation between patients with neuralgia and those, who did not have this disease diagnosed, also those, who have a broken bone in mandibular canal.
3. To analyze, whether sex and age has some influence to the canal narrowing and in which side of the mandible changes are more frequently diagnosed.

## **Methods**

There were analyzed 790 orthopantograms. In the first group there were 382 control patients. In the second one – 50 who had trigeminal neuralgia. In the third one – 167 patients, who had a broken mandible. Of all analyzed orthopantograms, 191 had not been evaluated. To reach accurate results, very small canals, canals that had their margins blurred with shadows of surrounding sclerotized tissues were not included. Additionally, patients younger than 18 years old or who had a broken mandible out of the canal borders were excluded too. Analyzing orthopantograms, MC diameter was measured in 3 main points in all three groups: first – the site of the angle of mandible, second – in the projection of mental foramen, third – visually determined middle point between distal and proximal points. The narrowest point was also measured and marked as the fourth point. Investigating orthopantograms in which the break of mandible reached MC, the site of the break was marked accordingly to the projection of the nearest tooth. Analysis of photographs was done using Kodak Dental Imaging program. Data was statistically computed using SPSS 22.0 program.

## **Results**

1. It is evaluated that general narrowing of MC is 2,26 mm: patients with neuralgia – 2,29 mm, healthy patients – 2,28 mm and patients with broken mandible – 2,21 mm. That is why narrowing of MC of those who had neuralgia is not significant to compare with other groups ( $p < 0,05$ ).
2. Neither to one of those who had a broken mandible, neuralgia was diagnosed. Out of all patients with neuralgia, the third branch of the disease was found in 16%, whose average mandibular canal narrowing was 2,33 mm and the narrowest point was usually found at the 8th tooth of the left side (56%).
3. More often neuralgia was diagnosed to women (28; 56%), canal narrowing was approximately 2,25 mm, however, sex did not have any influence because men (22; 44%) canal narrowing was approximately 2,33 mm ( $p < 0,05$ ). Whereas, for healthy people canal was more often narrowed in the right side of the jaw (56%): for men - 2,42 mm (40,1%), for women – 2,2 mm (59,2%).
4. In the group of broken jaw 59,9% of constrictions were found in the left side: for men – 2,2 (85%), for women – 2,0 mm (6,6%).
5. Analyzing results by the age, it was determined that the average age of patients with neuralgia (69,7 years) is higher than other groups (healthy – 44,6 years; with broken jaw – 31,2 years).

## **Conclusions**

1. To sum up, the narrowing of mandibular canal cannot be the main cause of neuralgia, because there was not found a correlative connection between healthy and with disease groups.
2. Analyzing data of patients with broken mandible, it was found that changes in the width of canal do not have influence for a chronic disease manifestation: neither one of all test subjects had had neuralgia of the 3<sup>rd</sup> branch diagnosed.
3. However, categorical conclusions cannot be done, because canal was only observed in 1 plane.

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## LOCAL ANAESTHETICS IN VITRO EFFECT ON TRANSFORMING GROWTH FACTOR B1 RELEASE RATE FROM PLATELETS

*Lukas Poškevičius, Skaistė Jaraitė*

*Supervisor of the abstract: Gintaras Janužis, Erika Skrodenienė*

*Department of Maxillofacial surgery, LSMU, Lithuania*

### Introduction

There is a considerable clinical interest in using autologous platelet-rich fibrin (PRF) alone or in combination with grafting materials in oral surgery. The scientific rationale behind the use of these preparations lies in the fact that the platelet  $\alpha$ -granules are a reservoir of many growth factors (GFs) that are known playing a significant role in hard and soft tissue repair mechanism. No studies have yet been done to examine the local anaesthetics effect on Transforming growth factor  $\beta$ 1 (TGF-  $\beta$ 1) content in PRF.

### Aim

To determine the release of Transforming growth factor  $\beta$ 1 from platelet-rich fibrin during time and assess impact of local anaesthetics with vasoconstrictor effect on release rate.

### Objectives

1. To evaluate Transforming growth factor  $\beta$ 1 concentration alterations in PRF after 1 hour, 4 hours, 8 hours.
2. To assess Transforming growth factor  $\beta$ 1 release rate from platelets in PRF at 8 hours period.
3. To investigate Articaine with epinephrine effect on Transforming growth factor  $\beta$ 1 release rate from platelets in PRF.

### Methods

Permission to do a reasearch was received from the Bioethics centre (BEC-OF-133). Six samples of 10 ml peripheral blood were collected from 14 healthy volunteers in 10-mL glass-coated plastic tubes without anticoagulant and, immediately centrifuged at 400xg for 14 minutes using the A-PRF table centrifuge. The PRF clots were retrieved from the tubes, the red blood cells and supernanant serum layers were detached and discarded. Six PRF clots were transferred into 2 sterile tubes - 3 PRF clots in each tube. In investigation group, the weight of PRF material was measured with electronic balance and adequate capacity of Articaine 4% solution with 10  $\mu$ g/mL epinephrine in proportion 1mg of PRF – 1 mL of anaesthetic was injected into the tube. The control group was left inert. The tubes were vortexed for 1 minute and left for incubation at room temperature. Samples from each group were taken after 1, 4 and 8 hours and immediately vortexed. Specimens were frozen at -80°C till determination of the TGF-  $\beta$ 1. TGF-  $\beta$ 1 concentration was determined by quantitative enzyme immunoassay (ELISA) using IBL International (Hamburg, Germany) test kit. Data analysis was performed using SPSS 20 software. P value of less than 0.05 was used to assess the significance of the differences in mean figures.

### Results

1. The mean total content of TGF-  $\beta$ 1 released from PRF at different time points increased gradually over the time course of the study ( $P < 0.001$ ). Content in the PRF reached mean values of 13.05 ng/mL in 1 hour, 14.85 ng/mL in 4 hours, and 18.88 ng/mL in 8 hours.

2. Transforming growth factor  $\beta$ 1 release rate reached its maximal point within first hours after PRF clot preparation: 0.96 ng/h during 2nd – 4th hour and 0.755 ng/h during 5th - 8th hour ( $P < 0.05$ ).
3. Articaine with epinephrine did not significantly reduce TGF-  $\beta$ 1 content in PRF clot, respectively, 16.83 ng/mL in 1 hour, 20.72 ng/mL in 4 hours, and 22.78 ng/mL at 8 hours ( $P > 0.05$ ).

### Conclusions

1. Transforming growth factor  $\beta$ 1 concentration alterations are time – dependent. TGF-  $\beta$ 1 concentration is estimated to be highest 8 hours after PRF clot formation.
2. The estimated TGF-  $\beta$ 1 secretion rate from platelets is highest at the first four hours.
3. Articaine with epinephrine does not significantly decrease Transforming growth factor  $\beta$ 1 release rate in PRF.

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## LONG TERM ESTHETIC OUTCOME EVALUATION OF DIFFERENT IMPLANTATION PROTOCOLS. A PROSPECTIVE RANDOMISED CLINICAL TRIAL

*Saulius Žukauskas*

*Supervisor of the abstract: Ričardas Kubilius, Algirdas Puišys*

*Department of Maxillofacial surgery, LSMU, Lithuania*

### Introduction

Esthetic implant restoration in the anterior maxilla is a challenge for clinicians. Alveolar ridge and surrounding gingiva deficiencies aggravates implant placement in the esthetic area. Over the past years immediate implantation and early implant placement have been advocated as the best methods to retain good aesthetics. (1,2) As a rule, 2-4 mm of buccal bone is lost after tooth extraction. (3) Most commonly guided bone regeneration (GBR) is used to correct bone defects and build harmonious soft tissue architecture. (4) Palatal connective tissue grafting (CTG) is usually used for this soft tissue thickening. (5) However, additional morbidity caused by the harvesting procedure of CTG is a serious disadvantage. (6) Collagen tissue matrix derivate membrane or allogenic membrane is an alternative for CTG in alveolar soft tissue augmentation. (7) In this research was compared the aesthetic outcome of two different implantation techniques: early implant placement with guided bone regeneration and early implant placement with guided bone regeneration and simultaneous soft tissue augmentation with collagen tissue matrix derivate.

### Aim

To find which early implant placement protocol gives better long term esthetic results.

### Objectives

To evaluate the esthetic outcome of two different implant placement protocols using Complex Esthetic Index (CEI) and correlate it with soft tissue biotype.

## Methods

Study was approved by the Lithuanian University of Health Sciences ethical committee (No.BEC-OF-566). 36 patients who needed implantation in the esthetic zone (anterior maxilla) participated in the study. Patients randomly divided into two groups: group A (n = 18) patients treated with early implant placement with guided bone regeneration and simultaneous soft tissue augmentation with collagen tissue matrix derivate, group B (n = 18) patients treated with early implant placement and guided bone regeneration, without soft tissue augmentation. For esthetic analysis Complex Esthetic Index (CEI) by Juodzbalytė et al was used. (8) For data analysis SPSS 20.0 software was used. Group homogeneity was checked with chi-square test. Quantitative variables were examined with Student-t test and Mann-Whitney test for nonparametric values, qualitative variables examined with chi-square test (Monte Carlo method).

## Results

From 36 selected patients, 24 patients (group A, n = 10; group B, n = 14), participated in further study, because 12 patients refused to come to follow up visits. After evaluation with Complex Esthetic Index (CEI), mean soft tissue index (S) for test group B was 57,14 (29,7), for test group A – 72,0 (21,49). Mean predictive index (P) for test group B was 73.57 (19,45), for test group A was 86.00 (20,65). Mean restoration index (R) for test group B was 78.57 (15,6), for test group A was 85,0 (11,7). Student-t test S ( $p = 0,192$ ), P ( $p = 0,147$ ), R ( $p = 0,289$ ) and Mann-Whitney method S ( $p = 0,199$ ), P ( $p = 0,119$ ), R ( $p = 0,367$ ) showed no significant difference between S,P,R values and protocol (A or B) selection. Although, chi-square test (Monte Carlo method) showed that when A surgical method is used, gingival biotype is thick (90%) or medium (10%), when B surgical method is used, gingival biotype is medium (42,9%) or thin (10%), the difference is statistically significant ( $p < 0,005$ ). Chi-square test confirms that when gingival biotype is thick, P ( $p = 0,003$ ) value is higher. Statistically significant connection between S, R values and gingival biotype was not found.

## Conclusions

Within the limitation of this study the mean values of Complex Esthetic Index (CEI) S, P and R are higher using surgical protocol with simultaneous soft tissue augmentation. This method can be recommended for implantation in the esthetic zone. Further long-term trials are needed to determine the efficacy of this surgical approach.

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# MESENCHYMAL CELL SURVIVAL IN XENOGENEIC BONE TRANSPLANT

*Gustas Doviltis, Žygimantas Šakavičius*

*Supervisor of the abstract: Gintaras Janužis, Artūras Stumbras, Mindaugas Pranskūnas*

*Department of Maxillofacial surgery, LSMU, Lithuania*

## Introduction

Stem cell research and attempts to use them for restorative medicine is becoming more popular. So we decided to find out whether stem cells could be used in the reconstruction of bone defects. It is necessary to find out whether these cells, when applied to defect, can reproduce and differentiate into osteoblasts, or simply die.

## Aim

Investigate stem cell survival in xenogeneic bone matrix.

## Objectives

1. Mark stem cells by intracellular dye.
2. Transplant painted stem and xenogeneic matrix mixture into the rabbit bone defect.
3. To assess the histological sample at different time points.
4. Evaluate whether the sample after the control period had autologous cells.
5. Set colored stem cell proliferation and autologous cells ratio from the sample.

## Methods

1. Stem Cell Cultivation. Stem cell culture painted with "CFC" paint. Cultivat painted and healthy cell culture, where we decide paint cytotoxicity and cell survivability.
2. Preparation of graft. Matrix for transplantation is used of xenogeneic bone beads. Pilot graft is impregnated by painted rabbit stem cells.
3. The transplanting operation. The bone defect is formed in rabbit kull bone and it is filled with painted stem cells and bone.
4. Cell checkups. Samples are taken after 2 and 4 weeks and evaluated histologically. Searching for ratio of stained cells and autogenous cells.

## Results

1. Stem cell transplants survived for up to 4 weeks.
2. After the trial period autologous cells appeared in the sample, as performed histological examination not all of the cells has used dye.
3. After 4 weeks in sample were more autologous cells comparing with 2 weeks sample.
4. According to the dye preservation in stem cells (their fading), we can say that the stem cells proliferate.

## Conclusions

1. Xenogeneic stem cells in transplant survived and proliferated.
2. Xenogenic stem cells transplantation in bone matrix accelerates bone regeneration.
3. Stem cells in first two weeks proliferated more actively then autogenous.

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## MICROSURGICAL REPAIR OF INFERIOR ALVEOLAR NERVE

*Tautvydas Andriulionis, Asta Staniulienė*

*Supervisor of the abstract: Gintaras Juodžbalys*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Inferior alveolar nerve damage is a well-known risk of dental and oral surgical procedures. A. B. G. Tay et al. (2007) reported that nerve can be damaged by odontectomy (52.1 pct.) (lower third molar), local anesthetics injection (12.3 pct.), orthognatic surgery (12,3 pct.), implant surgery (11,0 pct.), trauma (2,7 pct.), endodontic therapy (1,4 pct.) [1].

### Aim

The aim of this study is to evaluate microsurgical inferior alveolar nerve repair results.

### Objectives

1. Evaluate indications for microsurgical inferior alveolar nerve repair.
2. Evaluate factors which affect operation outcomes.
3. Evaluate long term complications after microsurgical inferior alveolar nerve repair.

### Methods

A literature review of English articles was conducted by using MEDLINE (PubMed), ScienceDirect, SpringerLink databases restricted to 2002-2015 and constructed according PRISMA guidelines. Search terms included „Microsurgical inferior alveolar nerve repair“, „Inferior alveolar nerve repair“, „Inferior alveolar nerve neurorrhaphy“. Only studies where follow-up was at least 9 months after operation were included in review.

### Results

B. Ziccardi et al. (2007) stated that absolute indication for microsurgical inferior alveolar nerve repair is a witnessed transection. If at any time there is worsening of the hypoesthesia or development of dysesthesia, then microsurgical intervention would be warranted [2, 3]. Most authors recommend microsurgical inferior alveolar nerve repair when patient feels hypoesthesia, hypoesthesia with pain or anesthesia over 2-4 months, lack of protective reflexes [2, 4-7]. The best guidelines are probably those that are individualized for each patient with respect to their presenting complaints and symptoms [2]. Therefore, it would seem logical to repair the nerve as early as possible once it was

clear that it was not going to recover [8]. In literature there is no single opinion when operation should be made authors perform inferior alveolar nerve repair 3-24 months after injury [9-16]. RHB Jones (2010) stated that early exploration and repair of motor nerves, offers the best result. Motor end-plate function is easily lost and is critical for recovery. However, sensory function and the sensory receptors are not so critical [8]. Zuniga J. R. et al. (2014) reported that patients gender did not appear to have impact on neurosensory recovery however inferior alveolar nerve is more often damaged in females by dental and oral surgical procedures [17]. Males more often inferior alveolar nerve damage occur after maxillofacial trauma [18]. Edward R. Straus et al. (2006) reported that sensory improvement is not significantly associated with shorter times to surgery [7] however other authors stated that Early repairs appeared to do better than late repairs but not statistically significance [4]. Bagheri S. C. et al. (2012) stated that is significant negative relationship between increasing patient age and improvement, with a threshold drop of achieving functional sensory recovery at 51 years of age [19]. Other author approve it [20]. The most unwanted complication after microsurgical inferior alveolar nerve damage is neuropathic pain. Zuniga J. R. et al. reported that one patient of 51 with no neuropathic pain prior to surgery had neuropathic pain after surgery [20].

### Conclusions

1. Microsurgical inferior alveolar nerve must be repair as early as possible once it was clear that it was not going to recover.
2. Significant negative relationship is between increasing patient age and improvement in functional sensory recovery.
3. Long term outcomes after microsurgical inferior alveolar nerve damage occurs in 1.9 pct. patient.

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## PROPOLIS EFFECT ON ORAL MICROBIOTA: A SYSTEMATIC REVIEW

*Aistė Kragnytė, Kamilė Danilevičiūtė*

*Supervisor of the abstract: Ingrida Marija Pacauskienė*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Propolis is a natural substance produced by honeybees upon collection and transformation of resins and exudates from plants. Components of propolis extracts like flavonoids (quercetin, galangin, pinocembrin) and caffeic acid or cinnamic acid show antibacterial effect. As an ecological alternative to conventional anti-infective treatments, propolis is becoming more and more important in the fields of pharmacy, medicine and odontology for its multiple pharmacological properties including anti-cancer, antioxidant, fungicidal, antibacterial, antiviral, and anti-inflammatory among others. Preparations with propolis are used to support and promote oral health but their effectiveness is not completely clear. So it is important to evaluate the role of propolis in oral health because of its promising natural features.

### Aim

To review the latest scientific literature, evaluating efficacy of propolis in reduction of oral microbiota.

### Objectives

1. To evaluate sensitivity of oral microorganisms to propolis in vitro.
2. To assess factors influencing propolis antimicrobial effect.
3. To determine clinical relevance of propolis preparations.

### Methods

A systematic literature search in Medline (PubMed), ScienceDirect, Google Scholar and Wiley Online Library databases was conducted using the following keywords: propolis, oral, antibacterial, antifungal, oral pathogens, oral health, antimicrobial activity, periodontitis. The included studies had to meet the following criteria: all studies that included propolis use in humans, randomized controlled trials; in vitro studies; comparative studies; placebo-controlled studies; research articles published from 2005 to 2015. The reviews, studies with animals and case reports were not included.

29 studies that met the required criteria were selected for the final analysis. Because of methodological heterogeneity and limited number of studies meta-analysis was not performed.

## Results

In 23 in vitro studies propolis has shown antibacterial activity against Gram-positive (*S. mutans*, *S. aureus*, *S. sobrinus*, *S. mitis*, *S. sanguinis*, *S. oralis*, *S. salivarius*, *S. pyogenes*, *Lactobacillus* spp., *E. faecalis*) and Gram-negative bacteria (*P. gingivalis*, *Capnocytophaga* spp, *Actinomyces* spp., *P. intermedia*, *F. nucleatum*), also antifungal activity against *C. albicans*, *C. cruisei*, *S. schenckii* and *P. brasiliensis*(1-29). Gram+ bacteria are susceptible to lower concentrations in comparison to Gram- (2-7). Propolis shows smaller antibacterial activity compared to Chlorhexidine, the extract with 40% alcohol is the most similar (10)(11). The aqueous extract of propolis has a lesser extent in antibacterial effect than ethanolic, what indicates that ethanol soluble constituents of propolis are responsible for its antibacterial effect (9)(10). The age of propolis extract has no influence on ability to inhibit the growth of Gram+ bacteria (8). Clinical research studies reported that it may show anticaries and antiplaque properties (1)(4)(9)(13)(16)(29). Propolis can promote periodontal health, decrease gingival inflammation, bleeding and shows better clinical and microbiological results when used for subgingival irrigation (4)(17)(18). Studies revealed its effectiveness as natural intracanal medicament for endodontic root canal treatment (19–21) and may show antibacterial effect when used in mouthrinses, toothpastes, also when added to glass ionomer cement (GIC) (4)(14)(15)(22-26).

## Conclusions

1. Propolis has significant antimicrobial activity in vitro against Gram-positive, Gram-negative oral bacteria and fungi. The strongest effect is detected against Gram-positive bacteria.
2. The effect of propolis may vary depending on its constituents, their amounts or the geographic origin and solvent type.
3. Propolis preparations may decrease dental plaque formation, reduce gingival inflammation, inhibit intracanal m/o. Because of limited number of studies further well designed trials are needed.

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# RELATIONSHIP BETWEEN SERUM 25-HYDROXYVITAMIN D<sub>3</sub>, PERIODONTAL AND MANDIBULAR BONE STATUS IN POSTMENOPAUSAL WOMEN

*Sabina Pakalniskyte, Gintare Dambrauskaite*

*Supervisor of the abstract: Egle Jagelaviciene, Inga Vaitkeviciene*

*Faculty of Dentistry, Lithuanian University of Health Sciences, Lithuania*

## **Introduction**

Vitamin D is important for bone metabolism, has immunomodulatory, antiproliferative, antiinflammatory and differentiative effects. It also influences apoptosis and autoimmune processes. Adequate concentration of vitamin D is hypothesized to reduce risk of periodontal disease and bone resorption. Recent studies investigated association between reduced plasma 25-hydroxyvitamin D [25(OH)D] concentration and increased risk of gingivitis and periodontitis. It has been shown that 1,25(OH)<sub>2</sub>D<sub>3</sub> promotes antibacterial responses of gingival epithelial cells. Vitamin D, which regulates homeostasis of calcium in the blood, influences mineralization of skeletal bones. When the concentration of calcium decreases in plasma, reabsorption of calcium from bones increases, bone mineral density (BMD) decreases, and therefore osteoporosis (OP) can develop. Some authors state that these changes can occur in all skeleton, including jaws: resorption of alveolar part, bone tissue reduction spread faster, and so predetermine reduction in number of teeth. It is suggested that osteoporosis-associated changes in the mandible should be evaluated by panoramic radiomorphometric indices – approved diagnostic OP criteria. One of them – mental index (MI) – could be determined by measuring cortical bone width in the mandibular base at the mental foramen and could be used for selecting patients with BMD changes.

## **Aim**

The aim of this study was to determine link between concentration of serum 25-hydroxyvitamin D<sub>3</sub> (25(OH)D), periodontal status and the mental index in postmenopausal women.

## **Objectives**

1. To determine 25(OH)D concentration in plasma in standardized fashion.
2. To perform clinical periodontal examination for indices determination and evaluate the relationship with plasma 25(OH)D.
3. To perform the panoramic radiographic examination in order to measure the mental index (MI) and to determine its relationship with plasma 25(OH) D.

## **Methods**

The study was performed in the clinic of Dental and Oral Disease at the LSMU. In the study post-menopausal females aged 50-87 from the Endocrinology clinic were included. Random sampling was used. The inclusion criteria were the following: female gender, age above 50, good or satisfactory general health status, 1 year free of use hormonal preparations or medications that could affect bone metabolism, absence of diseases leading to secondary OP, non smokers and non alcohol drinkers. The concentration of plasma 25-hydroxyvitamin D was determined and subjects were divided into two groups: group A - sufficient ( $\geq 50$  nmol/L;) and group B - non sufficient ( $< 50$  nmol/L;) concentration of vitamin D. According to Endocrine Society Clinical Practice Guideline (ESCPG) of evaluation, treatment and prevention of vitamin D deficiency published in 2011, the concentration below 20 ng/ml (50 nmol/L) was defined as deficiency. The other data were collected by all subjects from coded questionnaires, clinical periodontal and panoramic radiographic examinations. During full-mouth oral clinical examination teeth mobility, crowns, gingival recession, Löe-Silness gingival, Russell and CPITN indices were assessed. The panoramic radiographic examination was performed, the mandibular cortical width at the mental foramen was measured and mental index was determined. The cortical width was analyzed using MedCalc medical image analysis software, measurements were presented in mm. The software used was Statistical Package for Social Sciences version 19. Statistical analysis was performed using chi-square. The level of statistical significance was defined as  $p < 0.05$ .

## Results

In total, 50 post-menopausal females were investigated. Mean age of the studied group was  $69,29 \pm 8,73$  ( $\pm$  SE). Mean of 25(OH)D in the studied group was  $53,84 \pm 22,47$  ( $\pm$  SE); in group A  $71,61 \pm 13,08$  ( $\pm$  SE); in group B  $34,59 \pm 12,09$  ( $\pm$  SE). The differences between 25(OH)D groups  $p > 0,05$ . According to ESCPG, 51% of the post-menopausal females from group A had sufficient plasma 25(OH)D level (25(OH)D $>50$  nmol/l). Clinical periodontal examination shows periodontitis in most studied subjects (96%). In A group Russell's index mean  $2,55 \pm 1,1$  ( $\pm$  SE), CPITN index -  $2,23 \pm 0,73$  ( $\pm$  SE) and Silness and Loe gingival index -  $1,19 \pm 0,38$  ( $\pm$  SE); in group B Russell's index -  $2,84 \pm 1,23$  ( $\pm$  SE), CPITN index -  $2,33 \pm 0,87$  ( $\pm$  SE) and Silness and Loe index -  $1,23 \pm 0,45$  ( $\pm$  SE). The differences between the groups were not statistically significant ( $p > 0,05$ ). Panoramic radiographic examination was performed, MI was determined and the mean values in the groups were calculated: in general group  $6,15 \pm 2,13$  ( $\pm$  SE); in group A MI mean  $5,7 \pm 2,12$  ( $\pm$  SE); in group B -  $6,65 \pm 2,07$  ( $\pm$  SE); The differences between the groups  $p > 0,05$ . In general subjects group the statistically significant relationship was determined between vitamin D status and mental index ( $p < 0,05$ ).

## Conclusions

1. The sufficient 25(OH)D concentration in plasma was recorded for more than half females.
2. The all subjects in the studied group had periodontal disease. Women with inadequate vitamin D status were more likely to have more severe periodontal disease, which requires complex periodontal treatment.
3. In the general group the relationship between serum 25(OH)D level and MI was determined.

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## RELATIONSHIP BETWEEN TYPES OF LIP PRINTS AND THE MALOCCLUSION AMONG DENTISTRY STUDENTS IN LSMU

*Rūta Gegužytė, Jonas Valaitis, Eglė Žukauskaitė*

*Supervisor of the abstract: Dalia Smailienė*

*Department of Orthodontics, Lithuanian University of Health Sciences, Lithuania*

### Introduction

Cheiloscopy (science of lip prints) is an innovative tool of diagnosis in orthodontics. External surface of the lip has many wrinkles, elevations and depressions forming a characteristic pattern, called lip print. It is unique for every individual and does not change in time. Cheiloscopy is developing quickly. There are studies evaluating possible association between fingerprints and lip prints, fingerprints and malocclusions, so there is a need to explore the possible association of lip prints with malocclusion. To our knowledge, lip prints have never been used in orthodontics as a diagnostic aid or forensic tool. Possible association between lip prints and malocclusion could be easy-to-do non-invasive way of very early diagnosis of malocclusions. If association between lip prints and malocclusion would be determined, this method of diagnosis could be used in a very early childhood for future occlusion prediction, so the treatment could be applied as early as needed.

### Aim

Explore the possible association between lip prints and malocclusions.

### Objectives

1. Evaluate the lip prints among the orthodontically untreated dentistry students of LSMU
2. Evaluate if there is an association between types of lip prints and types of malocclusions.

### Methods

The study sample was obtained from dentistry students of LSMU who agreed to participate in the study. A full explanation of the study procedures was provided and a written informed consent was obtained from all the subjects. The study was approved by the Bioethics Commission (nr. BEC-OF-336).

219 students were examined. Inclusion criteria: no history of orthodontic treatment, no presence of visible lip lesions, no congenital facial defects.

The examination consisted of the intraoral examination and recording of lip prints.

During the intraoral examination the relationship between the first lower and upper molars and canines was determined according to the Angle classification (53 individuals with subdivisions of Angle classes were excluded from the further investigation).

Other recorded occlusal parameters were: the deep overbite (when upper incisors cover lower incisors more than 2/3 of their crowns), a posterior crossbite (confirmed when at least 2 teeth showed a cross relationship with the opposite teeth in the posterior segments of the dental arches), anterior openbite.

The lipstick-cellophane technique was used to record lip prints. Red colored lipstick was used. All cellophane strips were placed on white paper for permanent record. Every measure was taken to prevent any cross contamination. The classification of lip print patterns offered by Suzuki and Tsuchihashi, (1970) was used:

Type 1: Clear-cut vertical grooves that run across the entire lips.

Type 1': Similar to type I, but do not cover the entire lip.

Type 2: Branched grooves.

Type 3: Intersected grooves.

Type 4: Reticular grooves.

Type 5: Undetermined.

To reduce the method error, all the lip impressions were evaluated thrice – by three independent researchers. If there was a disagreement, opinion of two researches was chosen. There were no cases when three different evaluations were done.

All statistical analyses were performed using the statistical software package “SPSS 22.0 for Windows”. Hypotheses of interrelations between characteristics were verified using the  $\chi^2$  criterion method.

## Results

The sample consisted of 166 subjects: 68,81% females and 31.19% males. After analyzing lip patterns, it was found that type 3 (intersected grooves) lip pattern was most common (25.69%) followed by type 4 (reticular grooves) (24.77%), type 2 (branched grooves) (18.35%), type 1 (vertical grooves) (16.51%), undetermined lip pattern (type 5) (10.09%) and type 1' (partial vertical grooves) (4.59%). Type 4 lip print was most common in females (32.00%); type 3 - in males (38.20%); ( $p < 0.05$ ).

According to Angle classification all individuals were divided into three groups: Angle I group – 118 subjects, Angle II group – 42 subjects, Angle III group – 6 subjects. Most common type of lip prints among Angle class I subjects was type 3 (32.20%), followed by type 2 (20.30%), type 4 (18.60%), type 5 (6.80%) and type 1' (6.80%). Most common type of lip prints among Angle class II subjects was type 4 (38.10%). However, this difference was not statistically relevant ( $p = 0.1$ ), but the tendency can be stated.

Most common type of lip prints among patients with anterior open bite was type 5 (66.70%) ( $p < 0.05$ ). Most common type of lip prints among patients with deep and cross bite was type 4 (deep bite - 33.30%, cross bite- 37.50%) ( $p > 0.05$ ).

## Conclusions

1. Most common type of lip prints among Angle class I subjects was type 3 (intersected lip pattern), Angle class II – type 4 (reticular lip pattern) ( $p < 0.05$ ).
2. Intersected lip pattern (type 3) was most common among dentistry students of LSMU.
3. This study shows the possibility to use cheiloscopy as a diagnostic aid in orthodontics. However, further investigations to confirm the relevance of the method is needed.

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## STRESS DISTRIBUTION IN BONE: SINGLE-UNIT IMPLANT PROSTHESES WITH HYBRID CERAMICS OR RESIN NANO-CERAMIC RESTORATIONS

*Lukas Poškevičius*

*Supervisor of the abstract: Gintaras Juodžbalys, Valdas Eidukynas*

*Department of Maxillofacial surgery, LSMU, Lithuania*

## Introduction

Occlusal loading of osseointegrated implants is believed to be a determining factor in the longevity of implant treatment. The selection of material used on the occlusal surfaces of implant-supported restorations is also important, since these materials may transmit destructive forces to the interface between alveolar bone and implant. Osteoclastic bone resorption occurs in areas in which microcracks are produced by occlusal stress and osteocyte apoptosis. Although various hybrid restorative materials have recently been introduced, insufficient data exist regarding the effect of stress distribution on their mechanical performance. Therefore, efficacy of hybrid restoratives as a superstructure material needs to be tested and its stress distribution when a load is applied requires evaluation.

## Aim

To analyse resultant stresses during static occlusal loading on one unit fixed, implant supported crown in a 3-dimensional finite element analysis model.

## Objectives

1. To compare the resultant stresses both in the superstructures and in the supporting bone on implant supported with resin nano-ceramic and polymer infiltrated ceramic prostheses material.
2. To identify highest stress localization in bone – implant interface.
3. To assess restorative material effect on distribution of total displacements in the superstructures.
4. To investigate resultant stresses within different human mandible densities.

## Methods

Computation and visualization of stress, deformation and displacement distribution in complex structures were evaluated by finite element analysis (FEA) code ANSYS AUTODYN (Swanson Analysis Systems, Inc., Houston, TX, USA). A model containing one implant surrounded by its portion of the mandible was used, which was prepared by using a 3D solid modelling system SolidWorks. A sagittal section through an edentulous mandible in the first molar region of a normal individual defined the geometry. Four different cancellous bone densities were modelled (varying in modulus of elasticity) and were surrounded by a 1.2 mm thick cortical layer. One-stage, screw-shaped, OSTEOFIX (Oulu, Finland) titanium dental implant with diameter of 3.8 mm and length of 12 mm was modelled into mandibular cross-sectional bone models. Metal abutments and fixed single crowns were modelled on top of the implants, each of which had been placed in the centre of mandibular crest. The bone-implant interface was assumed to simulate ideal osseointegration. Two different superstructure models, depending on restorative materials were used: hybrid ceramic, comprised of a structure-sintered ceramic matrix, of which the pores are filled with a polymer material (VITA Enamic); and resin nano-ceramic, highly cross-linked resin reinforced with bonded nano-particles (Lava Ultimate). Static loading conditions in three different directions were used: horizontal (Fh) at 0°, vertical (Fv) at 90°, and oblique (Fo) at 120°. A vertical load of 500 N, a horizontal load of 143 N, and an oblique load of 1000 N were applied, respectively. The distribution of deformations (displacements) and stresses (von-Mises equivalent stresses) were obtained for each case of loading for different restorative materials and bone density.

## Results

1. The Maximum Von Mises stress was observed to be least in cancellous bone (42.54 MPa), whereas stress level was significantly higher in the cortical bone (281.49 MPa), and titanium implant (199 MPa). The stress level was maximal in superstructures (2121 MPa). The highest level was noted in the models that had been subjected to static (2388 MPa) vertical loading forces using the VITA Enamic restorative material ( $P < 0.05$ ).
2. Research showed the highest stresses in the cortical bone in the regions adjacent to the first thread of the implants (75%). Stress level was highest in apical portion of cancellous bone around dental implants, during vertical load in D2-D4 bone density models (25%).
3. The maximal displacements significantly depend on the restorative material: 87.3  $\mu\text{m}$  for Lava Ultimate and 158.92  $\mu\text{m}$  for Vita Enamic ( $P < 0.05$ ).
4. Resultant stresses within different mandible densities revealed that decrease in bone density does not affect the stress level in cancellous bone (80.54 MPa in D1 bone density, 65.13 MPa - D2, 38.55 MPa - D3 and 33.78 MPa - D4;  $P$

= 0.194); and dental implants (281.90 MPa – D1, 301.91 MPa – D2, 438.98 MPa – D3, 436.22 MPa – D4; P = 0.366). However, it does increase resultant stresses in cortical bone, as 245.44 MPa in D1 bone density, 299.05 MPa - D2, 479.47 MPa - D3 and 684.18 MPa - D4 (P < 0.05).

### Conclusions

1. The highest stresses occurred within the superstructures. The stress level was least in cancellous bone and considerably higher in the cortical bone and dental implants.
2. The highest stresses in the bone - implant interface occurred in the region of cortical bone adjacent to the first thread of implants in all models.
3. The restorative material influenced displacements amount: Vita Enamic increased total displacements number in comparison with Lava Ultimate.
4. The decrease in bone density does not affect the stress level in cancellous bone and dental implants, but increased stresses in cortical bone.

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## SURGERY-RELATED FACTORS AFFECTING THE STABILITY OF ORTHODONTIC MINI IMPLANTS SCREWED IN ALVEOLAR PROCESS INTERDENTAL SPACES: A SYSTEMATIC LITERATURE REVIEW

*Greta Gintautaitė*

*Supervisor of the abstract: Alė Gaidytė*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Mini implants (MI) screwed in the interdental areas are the most commonly used temporary anchorage devices (TADs). MI stability (success rate) is determined by various factors, which operate simultaneously, therefore it is difficult to evaluate their individual influence. It was suggested to group these factors as follows: 1) surgery-related, 2) orthodontic-related, 3) patient-related. The results of recent researches have shown that surgery-related factors have the greatest impact on MI stability.

## **Aim**

To systematically review articles researching the influence of surgery-related factors on the stability of MI screwed in alveolar process interdental spaces.

## **Objectives**

1. To conduct a systematic literature review of articles published between 2010-2014 that analyze the influence of surgery-related factors on the stability of MI screwed in interdental spaces on the basis of the PRISMA Statement and Cochrane guidelines.
2. To determine what surgery-related factors were analyzed and how they affect MI stability.

## **Methods**

This systematic literature review was conducted on the basis of the PRISMA Statement and Cochrane guidelines. The used key words for the articles research in Medline and SciVerse databases were: mini implant, mini screw, temporary anchorage device, surgical, stability. The inclusion criteria were:

- 1) the analysis of surgery-related factors influence on the stability of MI screwed in interdental space,
- 2) the analysis of stability of MI used in clinical practice during orthodontic treatment,
- 3) the sample was 40 or more MI,
- 4) the diameter of MI used in research was 2 mm or less,
- 5) MI was used as an anchor for at least 12 weeks,
- 6) an article which was published in English in peer-reviewed journals between 2010-2014,
- 7) the research results were statistically significant,
- 8) no sex or age restrictions were placed.

The exclusion criteria were:

- 1) a case report, 2) in vitro study, 3) a finite element analysis, 4) a non-human study, 5) a literature review. Among 1571 initially identified relevant articles, 1174 unique citations remained after removal of duplicates. After applying the selection criteria, 13 articles (1-13) remained for this systematic review. On the basis of modified Feldmann and Bondemark (14) method, the articles were evaluated qualitatively. 11 articles were of high quality (score 8-10), 2 articles were of medium quality (score 6-7). The significant heterogeneity within and between studies did not allow for pooling of data and carrying out a meta-analysis.

## **Results**

The analyzed surgery-related factors affecting MI stability in the reviewed articles were: the jaw, side, thickness of cortical bone, bone density, type of soft tissue, insertion angle, torque, root proximity and surgical experience. Bone quality, oral mucosa type, root proximity and surgical experience were determined to be the factors that affect the MI stability the most. A higher success rate (94.8%-100%) was observed of those MI that were screwed in a high quality (Q1-Q3 by Lekholm and Zarb (15)) bone. Root proximity was emphasized to be the major MI stability affecting factor. A single or multiple MI-root surface contacts resulted in average 26.7% lower success rate. MI screwed in by more experienced surgeons had 7.1%-17.1% higher success rate. Higher MI success rates were observed when screwed in keratinized mucosa. The side of MI implantation, cortical bone thickness, bone density and insertion angle were not concluded to have statistically significant influence on MI stability. The overall success rate of MI stability was 87.7%-97%, higher in maxilla (86.9%-97.2%) than mandible (70.69%-93.7%).

## **Conclusions**

1. The systematic literature review of 13 articles of 2010-2014 indicated that the influence of jaw, side, thickness of cortical bone and bone density, type of soft tissue, MI insertion angle, torque, root proximity and surgical experience on MI stability was analyzed.
2. Analyzed researches had shown that MI stability was influenced the most by the bone quality, oral mucosa type, root proximity and surgical experience. There was no statistically significant difference of MI stability due to the side of MI implantation, cortical bone thickness, bone density and insertion angle. The MI should be screwed in by experienced clinicians and any MI-root surface contacts should be avoided.

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# THE EFFECT OF DIFFERENT POLISHING SYSTEMS ON THE QUALITY OF TOOTH PREPARATION MARGINS

*Odeta Vyšniauskaitė*

*Supervisor of the abstract: Lina Lasienė*

*Lithuanian University of Health Sciences, Lithuania*

## **Introduction**

It has been reported that dentists spend 60% to 70% of their working time replacing restorations, which causes high personal and social costs. The replacement of restoration is mainly related to the occurrence of secondary caries. Secondary caries might be due to primary lesions around restorations and it is known as dental caries near restorations. The main locations are areas of biofilm stagnation, such as cervical margins of restorations. Microleakage has been strongly associated with marginal gap. Smooth surface is very important for esthetics and longevity of restorations and this surface is obtained with proper finishing and polishing procedures. The finishing procedure aims at an adequate anatomy, whereas polishing decreases surface roughness and minimizes the microgaps produced by the finishing instruments. The extremely precise preparation margin improves the quality and accuracy of crown preparations, which may lead to better impressions and closer adaptation of restorations. Proper polishing system choice may lead to a better clinical results and restoration longevity.

## **Aim**

The purpose was to evaluate the condition of crown preparation margins which were polished using different polishing systems.

## **Objectives**

1. To identify the effect of polishing systems of the tooth marginal edge.
2. Measure difference in surface characteristics of finishing lines prepared using different polishing systems.

## **Methods**

- 100 extracted human teeth (n = 100) were stored in a physiologic solution of 0.9 percent since extraction. The selected teeth were chosen using inclusion criteria that rejected those with caries, cracks, or other defects.
- Each tooth was prepared to receive porcelain crown just in one surface using a high-speed handpiece and diamond crown marginal edge (shoulder technique – 1mm) preparation burs. A cylindrical bur #12 was used to place depth grooves in labial surfaces. A single operator carried out the tooth preparation.
- Teeth were randomly divided into 4 groups (n = 25/group): 1) non – polished – control group 2) the other group was finished using end-cutting burs – #12 Red (60µm) for 30 seconds and #12 Yellow (45µm) for 60 seconds 3) The third group was prepared with Arkansas cylinder (10P supra white Arkansas abrasive stone in fine grit on a straight handpiece shank) 4) the fourth group was finished using ultrasonic instruments with a factory – calibrated ultrasonic generator with water spray. 1. PM1 (76 – µm grit): power setting 30 seconds; 2. PM2 (46 – µm grit): power setting 15 for 60 seconds; 3. PM3 (no grit): power setting 10 for 120 seconds.
- The surface roughness of each specimen were recorded using a profilometer (MarSurf PS1) with automatic cutoff selection (patented) by second operator. Then tracing at the marginal edge location of each specimen were recorded (L = 1.75 mm). Profilometer results were analyzed taking the Ra value into consideration.
- Means and standard deviations were calculated for surface roughness. Data were analyzed by the Turkey test for surface roughness. All statistical analysis was conducted at a significance level of P < 0.05.

## **Results**

- The comparison of different polishing techniques revealed that there was no statistical difference in surface roughness values using end-cutting diamond burs and Arkansas cylinder (P > 0.05) for polishing. Significant differences

were found between non – polished and polished with one of the polishing systems surfaces.

— The best polishing results were with ultrasonic polishing system compared to other polishing systems ( $P < 0,05$ ).

### Conclusions

1. The finishing lines produced with the PM 1, 2, 3 tips were in a better condition, more precise and distinct than those produced with Arkansas cylinder or using end-cutting diamond burs.

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## THE EVALUATION OF KNOWLEDGE BY GENERAL PRACTICE DENTISTS ABOUT ORTHODONTIC TREATMENT NEED AND PREVENTION OF ORTHODONTIC ANOMALIES

*Žygimantas Labanauskas, Donata Petronytė*  
*Supervisor of the abstract: Kristina Lopatienė*  
*Lithuanian University of Health Sciences, Lithuania*

### Introduction

The predominance of malocclusion among 7–15 year-old pupils in Lithuania reaches 84.6%. Referrals to orthodontic

clinics mostly occur from offices of general practitioners. That is why it is important to pay attention to knowledge by general practitioners about malocclusions and prevention methods of orthodontic cases. The early diagnosis and referral to an orthodontist are important to provide the best and fastest treatment.

### **Aim**

The aim of the work is to evaluate the orthodontic knowledge of dentists, and peculiarities of cooperation with orthodontic specialists.

### **Objectives**

1. To evaluate the opinion of dentists about the acquired orthodontic knowledge and cooperation with orthodontists.
2. To evaluate the knowledge of dentists about prevention of orthodontic anomalies.
3. To evaluate the ability to recognize the main orthodontic pathologies: Class I, Class II Division 1, Class II Division 2, Class III and open bite.

### **Methods**

The permission to perform a study from LSMU Center of Bioethics No. BEC-OF-494 was obtained. General practice dentists were given to fill in the anonymous questionnaire. The questionnaire consisted of 20 questions: the first section contained questions about socio-demographic status, while the focus of the second one was knowledge by general practitioners about prevention of orthodontic anomalies and 5 clinical situations. The five typical clinical cases of malocclusion (Class I, Class II Division 1, Class II Division 2, Class III and open bite) were selected, and their intraoral photos were presented to evaluate them (the frontal centered dental photograph, the right and left buccal dental photograph). Using the random sampling method, general practitioners received 130 anonymous questionnaires – 89 out of them were answered. Statistical analysis was performed by collecting data and analyzing the software package SPSS 21.0. The precondition of normality for continuous variables was checked by using the Shapiro-Wilk test. Statistical significance was evaluated by using  $\chi^2$  and the Mann-Whitney U criteria. The difference between data of two independent groups was considered to be statistically significant since the significance level was  $p < 0.05$ .

### **Results**

89 dentists participated in the study. 77% of participants worked in cities, 23% – in small towns. 53.9% of participants had work experience up to 10 years. 46.1% have worked for over 11 years. The questionnaire data revealed that 55.1% of participants cooperate with orthodontists, while 44.9% do not. Participants, working in cities, cooperate with orthodontists more often than those working in small towns ( $p < 0.05$ ). Self-assessment of knowledge in orthodontics was distributed as follows: 61.4% acquired their orthodontic knowledge at a university, 38.6% gained knowledge in conferences and courses. Evaluation of their awareness regarding orthodontic knowledge: sufficiently – 59.6%, of which 22.5% of participants evaluated their knowledge as very good and good, 40.4% of participants think that they lack knowledge. The performed questionnaire and evaluation of orthodontic anomalies development revealed that, according to Angle's classification, the relationship of the first upper and lower molars was evaluated by 57.3% of participants, 87.6% explained peculiarities of mouth hygiene, 43.8% treated and corrected harmful habits of children, 71.9% of the dentists evaluated the patient's parafunctional habits. Statistically, the significant relationship between orthodontic work elements and work experience has not been determined. 74.2% of the dentists do not perform any orthodontic procedures. 25.8% perform the following orthodontic procedures: "trainer" system, space maintainers and removable appliances. Orthodontic preventive procedures are significantly more often carried out by dentists who have longer working experience ( $p < 0.05$ ). Performing the assessment analysis of the main clinical cases, the average of correct answers was  $3 \pm 1.41$  cases. Open bite was diagnosed correctly in most cases, while wrong answers were predominant by diagnosing Angle II division 2. Statistically, participants, having work experience up to 10 years, had significantly more knowledge in terms of the submitted situations compared to colleagues whose work experience reaches more than 11 years ( $p < 0.05$ ).

## Conclusions

1. The majority of dentists acquired the main orthodontic knowledge at universities; more than half of the respondents evaluated their knowledge as only sufficient. Dentists more often cooperate with orthodontists in cities ( $p < 0,05$ ).
2. Dentists evaluate the patient's harmful habits and the relationship of the first upper and lower molars, but a small part of the respondents correct harmful habits, or perform orthodontic procedures.
3. The ability of dentists to diagnose orthodontic anomalies is more than average. Dentists recognize the clear anomalies, but do not recognize the complex anomalies, such as Class II division 2. The study shows the importance to improve the basic knowledge in orthodontic anomalies for general practitioners.

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## THE EVALUATION OF UNDERCUTS APPEARANCE IN TEETH PREPARATIONS

*Mantas Jokšas, Mantė Kireilytė*

*Supervisor of the abstract: Lina Lasienė*

*Prothodontics clinic, Lithuania*

### Introduction

Undercuts are portions of the tooth preparation surface that are below the height of contour. They are ambiguous factor for the retention reduction or increase. However, there is no accurate data about undercuts appearance in preparations.

### Aim

The aim of this study was to evaluate undercuts' appearance in preparations of general dental practitioners (GDP) and Lithuanian University of Health Sciences (LSMU) Odontology Faculty (OF) 3rd course students.

### Objectives

1. To evaluate undercuts appearance in LSMU OF 3rd course students' and GDP preparations.
2. To evaluate undercuts appearance and their relation in preparations' walls.
3. To evaluate undercuts appearance in jaws and different groups of teeth GDP preparations.
4. To evaluate undercuts appearance in jaws and different groups of teeth in LSMU OF 3rd course students' preparations.

### Methods

94 models with 159 teeth preparations were selected from 9 GDP. 55 teeth preparations were selected from Prosthodontics (preclinical course) exam of LSMU OF 3rd course students. All chosen preparations were only for single crowns. Once conductive lacquer was removed with acetone, all preparations were fixed in standardized holders, sprayed with occlusion spray (Occlusions – Tuschier – Spray Grün, Germany) and scanned with CAD/CAM scanner (Ceramill Map 300, Austria, 2013). Undercuts' appearance was evaluated with Ceramill Map – v2.5.02 program. The greatest undercuts' depths were fixed. Statistical data analysis was performed by using SPSS 21.0.0.0. Qualitative

characteristics have been estimated applying  $\chi^2$  Test. Quantitative – nonparametric Kruskal-Wallis test was used for data analysis. The chosen significance level was  $p < .05$ .

## Results

Undercuts' depths were measured in mm and ranged from 0.01-0.08 (median (Mdn) 0.01), 0.01-0.09 (Mdn 0.01), 0.01-0.1 (Mdn 0.01), 0.01-0.08 (Mdn 0.02), respectively in mesial (M), distal (D), buccal (B) and lingual (L) walls. Statistically significant difference between undercuts' depths in different preparations' walls was not observed (Kruskal-Wallis Test,  $p = .679$ ). Analysis of GDP preparations showed that undercuts were observed 30% (N = 48), 36.9% (N = 59), 21.3% (N = 34), 16.3% (N = 26), of M, D, B and L walls, respectively. Undercuts' depths of LSMU OF 3rd course students' ranged from 0.01-0.1 (Mdn 0,02), 0,01-0,06 (Mdn 0,01), 0,01-0,1 (Mdn 0,02), 0,01-0,06 (Mdn 0,02), in M, D, B and L walls, respectively. There was no statistically significant difference between undercuts' depths in different preparations' walls (Kruskal-Wallis Test,  $p = ,26$ ). 57.9% preparations of GDP had undercuts (N = 95). 30.0% of undercuts were in M wall (N = 59), 36.9% in D wall (N = 59), 21.3% in B wall (N = 34) and 16.3% in L wall (N = 29). Analysing LSMU OF 3rd course students' preparations, undercuts were observed in 45.5% (N = 25), 50.9% (N = 28), 41.8% (N = 23) and 52.7% (N = 29), in M, D, B and L walls, respectively. Analysing GDP group groups with appeared D undercuts and without D undercuts there was found a relationship between undercuts appearance in D and M walls ( $\chi^2$  test,  $p < 0.001$ ) and L walls ( $\chi^2$  test,  $p = .001$ ). In 52.5% (N = 31) of D undercuts cases there were also observed M. While 28.8% (N = 17) of D undercuts samples had L undercuts. Analysing GDP group cases with L undercuts and without L undercuts there was found a relationship between undercuts appearance in L and M walls ( $\chi^2$  test,  $p = .015$ ) and B walls ( $\chi^2$  test,  $p = .001$ ). In 46.2% (N = 12) of L undercuts cases there were also observed B undercuts. While 50.0% (N = 13) of L undercuts samples also had M. Though in students group there were found significant relationships between appearance of D and M undercuts ( $\chi^2$  test,  $p = .001$ ), M and L undercuts ( $\chi^2$  test,  $p = .009$ ), L and D undercuts ( $\chi^2$  test,  $p = .005$ ). In cases with D undercuts 67.9% (N = 19) samples also had M undercuts and 71.4% (N = 20). After analysing undercuts that were made by GDP between upper and lower jaws, we found that 57.4% of undercuts were in upper jaw (N = 54) and 42.6% in lower (N = 40). Statistically significant difference between undercuts appearance between the jaws was not found. Different tooth groups' investigation showed that 21.5% of undercuts were in anterior teeth (N = 34), 19.0% were in premolars (N = 30) and 18.4% were in molars (N = 29). There was no statistically significant difference between undercuts appearance in different teeth groups. 40.0% (N = 18) of LSMU OF 3rd course students preparations' undercuts were in upper jaw and 60.0% (N = 27) in lower. Statistically significant difference was not found. 26.7% (N = 12) of undercuts made by LSMU OF 3rd course students were in anterior teeth, 35.6% (N = 16) in premolars and 37.8% (N = 17) in molars. There was statistically significant difference between undercuts appearance in different teeth groups ( $\chi^2$  Test,  $p = .031$ ). Undercuts are more frequent in premolars (35.6%, N = 16) and molars (37.8%, N = 17) in LSMU 3rd course students' work.

## Conclusions

1. Undercuts were more frequent in LSMU OF 3rd course students' work compared with GDP.
2. Undercuts were more frequent in D walls of preparations. Relationships between undercuts appearance in D and M walls and L walls and between undercuts appearance in L and M walls and B walls were found in GDP group. There were found relationships between appearance of D and M undercuts, M and L undercuts, L and D undercuts in students' group.
3. There was no statistically significant difference between undercuts appearance in different jaws and different groups of teeth in GDP clinical work.
4. There was no statistically significant difference between appearance of undercuts in different jaws, but there was statistically significant difference in premolars and molars preparations made by LSMU OF 3rd course students.

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# THREE-DIMENSIONAL PLANNING VERSUS MANUAL MODEL SURGERY DURING PRE-OPERATIVE WORK-UP FOR ORTHOGNATHIC SURGERY.A LITERATURE REVIEW

*Rokas Linkevičius, Greta Kalnietytė*

*Supervisor of the abstract: Simonas Grybauskas*

*LSMU, Lithuania*

## Introduction

Three-dimensional (3D) computed tomography (CT) combined with superimposed scanned dental casts (SSDS), computer-aided software (CAS), computer-aided design/computer-aided manufacturing (CAD/CAM) can recreate accurate enough maxillofacial anatomy and release a possibility to virtually plan the surgical correction of dentofacial deformities while performing virtual manipulations to idealize skeletal relationships and, furthermore, yet realistically evaluate the results of upcoming surgery. The discussion about the importance and usefulness of this modern method is rising more and more, but unfortunately, it is still not a widely spread technology, gaining for its path into the practice. Most of the orthognathic surgeons still use manual model surgery (MMS) to plan the operation and like this lose the accuracy during surgery. With this literature review we set out to determine advantages and disadvantages of these two methods used in the clinical practice of routine orthognathic surgery.

## Aim

To research, analyse and evaluate the scientific literature about the usefulness of 3D planning using CT combined with CAS and manual model surgery methods in the practice of orthognathic surgery planning.

## Objectives

1. Research and identify the effectiveness of 3D planning using CT combined with CAS in orthognathic surgery planning.
2. Research and identify the effectiveness of manual model surgery in orthognathic surgery planning.

## Methods

The research of scientific literature was performed using these data bases: Pubmed, Science direct, Springerlink, EBSCO publishing. These key words were used for the search: 3-dimensional planning in orthognathic surgery, 3D planning in orthognathic surgery, virtual planning in orthognathic surgery, 3D surgery, model cast surgery in orthognathic surgery, model surgery planning, manual model surgery. Were reviewed 58 publications from 2007 till 2015 years and 32 of them, in which 3D planning and manual model surgery methods thoroughly discussed, were selected for further analysis.

## Results

1. 3D planning with CT, SSDS, CAS recreate accurate facial anatomy, which is mandatory to evaluate the dentofacial deformity cause usually it's a 3D problem requiring consideration in all planes and simulation of the upcoming surgery making virtual osteotomies is possible, which help realistically plan the treatment(1,2) Due to these methods it is also possible to manufacture more precise intermediate occlusal splints using CAD/CAM technologies than using MMS, which leads to more accurate maxillo-mandibular complex positioning and final occlusion(3,32) CAS provide the benefit of optimal functional and aesthetic results, patient satisfaction, precise translation of treatment plan, facilitated intra-operative manipulation(4) Although, planning time can be minimised up to 25 days per year, if there are done about 200 surgeries(8) .
2. MMS involves many time consuming laboratory based steps and any discrepancy between the plan and MMS will lead to an inaccurate interocclusal splint(5) Information loss among the surgeons, orthodontists and dental technicians also provoke errors in pre-operative planning phase(5) Pivot errors occur when face-bow recording is used to position

the maxilla relative to the skull base by mounting casts to articulators(6)Significant error ( $p > 0.05$ ) is found in determining the position of the anatomic reference plane by face-bow transfer (mean deviation 7.7dg)(9)Maxilla can be also more under-advanced and over-impacted anteriorly than predicted before when MMS is done(10)

### Conclusions

1. Pre-operative 3D planning combined with specific modern technologies can help to achieve better post-operative outcomes of orthognathic surgery.
2. Pre-operative manual model surgery usage for orthognathic surgery planning lack accuracy and should be replaced by 3D planning in the near future.

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## VERIFICATION OF MANDIBULAR THIRD MOLAR IMPACTION CLASSIFICATION

*Tautvydas Andriulionis, Ina Azarovičiūtė*

*Supervisor of the abstract: Gintaras Juodžbalys, Povilas Daugėla*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Indications for mandibular third molar extraction are: existing pathology or pain due to pericoronitis, periodontitis, periapical abscess, cysts or neoplasms, resorption of adjacent roots, and inflammation of the opposing soft tissue. The location and configuration of impacted third molar, surrounding bone, mandibular canal and adjacent tooth are important in imaging diagnosis for the proper surgical operation planning. According to those factors G. Juodžbalys and P. Daugėla suggest mandibular third molar impaction classification.

## **Aim**

The aim of the study was to verify new mandibular third molar impaction classification applying it for preoperative examination, operation difficulty and postoperative complication prognosis.

## **Objectives**

1. To evaluate patient radiologic examination data by G. Juodžbalys and P. Daugėla suggested classification.
2. To evaluate patient clinical examination data at the operation time and compare with radiologic.
3. Evaluate patient operative and postoperative complications.

## **Methods**

Bioethics permission was obtained no. BEC – 367 and anonymous questionnaire way was made perspective research. This study include 29 patient which undergo one impacted mandibular third molar surgery in LUOHS KC Maxillofacial surgery department. Six radiological and clinical parameters were described by new mandibular third molar classification: mandibular ramus, second molar, alveolar crest, mandibular canal, and the spatial position of the tooth. Cone beam computed tomography (CBCT) scan was made if third molar contact with mandibular canal was suspected (C1, C2, C3). Patient without adjacent tooth or postoperative follow-up were excluded from the study. Tooth position were evaluated radiologically and clinically. We were evaluating following complications: mandibular fracture, damage of adjacent tooth, incomplete root removal, tooth displacement into soft tissues, inferior alveolar nerve damage, lingual nerve damage, bleeding, alveolitis, healing of alveolus, hematoma. Alveolitis was operationally defined by the presence of the following conditions: pain occurring 2 to 5 days after surgery that required additional treatment and placement of a dressing. Healing of alveolus was defined as healing without tight wound edges [2]. The data were analyzed using Statistical Package for the Social Sciences (SPSS). Monte Carlo exact test ( $p < 0,05$ ) and Cohen's Kappa coefficient were used. To ensure statistical significance data were randomized.

## **Results**

Study include 17 (58,6%) males and 12 (41,4%) females. Mean age of patient was 28,34 (standard error  $\pm 2,26$ ). Classification parameters coincidence were evaluated by Cohen's Kappa coefficient by the following value: By the new classification risk degree of presumptive intervention is scored as follows: conventional, simple, moderate, complicated. There was no statistically significant difference between risk degree of presumptive intervention and complication ( $p > 0.05$ ). Complications occurred for 7 (24,2%) patients. Hematoma for 3 (10,3%) patients (1 of these risk degree of presumptive intervention was simple, 2 moderate), healing of alveolus without tight wound edges occurred for 4 (13,8%) patients (1 of these risk degree of presumptive intervention was simple, 2 moderate and 1 complicated), lingual nerve was damaged for 1 (3,4%) patient whose risk degree of presumptive intervention was complicated. Nerve still do not recover, patient experience allodynia.

## **Conclusions**

1. Relation to the second molar radiologically and clinically correlate moderate.
2. Relation to the mandibular ramus and alveolar crest radiologically and clinically correlate good.
3. Relation to mandibular lingual and buccal walls and spatial position of the tooth correlate very good.
4. Relation to the mandibular canal radiologically and clinically compare was unable because non of patient undergo mandibular canal damage.
5. There was no statistically significant difference between risk degree of presumptive intervention and complication occurrence.

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# ONCOLOGY SESSION

# COMPARISON OF TUMOR SIZE ON COMPUTED TOMOGRAPHY AND 18 F-FLUORODEOXYGLUCOSE POSITRON EMISSION TOMOGRAPHY IMAGES OF NON SMALL CELL LUNG CANCER

Laima Tamkevičiūtė

Supervisor of the abstract: Jurgita Zaveckienė

Department of radiology (Lithuanian University of Health Sciences), Lithuania

## Introduction

Lung cancer is a common cause of cancer-related death. Computed tomography (CT) is the first-line imaging investigation in non small cell lung cancer (NSCLC) for detecting and staging, also for evaluation of response to treatment. 18 F-fluorodeoxyglucose positron emission tomography (PET) imaging and hybrid PET-CT imaging is a golden standard for management of lung cancer, mediastinal lymph node evaluation, detection of distant metastases, evaluation of response to chemoradiation and detection of recurrence. Whereas traditional radiologic imaging technologies (e.g., CT) provide morphologic information and define disease states on the basis of gross anatomical changes, PET imaging provides information on the biochemical processes. This advantage may help with more accurate staging than is possible with conventional imaging. It's very important to evaluate possible differences between CT and PET when measuring the size of pulmonary node.

## Aim

To evaluate the differences between CT and PET imaging when measuring the size of the NSCLC node.

## Objectives

1. To determine the differences of NSCLC node size between CT and PET imaging. 2. To evaluate the influence of time interval between CT and PET to the size of NSCLC node. 3. To determine a correlation between the differences of the NSCLC node size in CT and PET imaging when inflammatory infiltration is presence.

## Methods

The data of 57 patients with diagnosed NSCLC have been retrospectively analyzed. PET imaging have been performed from 2013 January to 2014 July. The CT and PET reports have been reviewed. The measurements of nodes on CT scan were compared to measurements of those nodes on PET scan. The presence of infiltration around the nodes has been determined. The influence of the infiltration to the differences of the node size on CT and PET has been evaluated. The time interval between CT and PET scans has been calculated and the correlation between time interval and tumor size differences has been evaluated. Spearman correlation coefficient and nonparametric statistic methods were used for calculations (Mann-Whitney Test for 2 independent values or Wilcoxon test for 2 related values). Data were considered statistically significant if value  $p < 0.05$ . Statistical analysis was performed using SPSS statistics 22.0.

## Results

The mean age of 53 patients was  $67 \pm 8,6$  years (mean  $\pm$  standart deviation), (min. 49; max. 83). 63 NSCLC nodes were analyzed. Long axis (LA) on CT  $4,49 \pm 2,45$ cm, (min. 0,6; max. 10,4). Short axis (SA) on CT  $3,41 \pm 1,91$ cm, (min. 0,4; max. 8,5). LA on PET  $4,32 \pm 2,25$ cm, (min. 0,5; max. 9,5). SA on PET  $3,49 \pm 1,84$ cm, (min. 0,5; max. 8,5). Size difference of LA on CT and PET  $0,37 \pm 0,65$ cm (min. 0,00; max. 4,1), the difference of LA is not statistically significant ( $p = 0,438$ ;  $p > 0,05$ ). Size difference of SA on CT and PET  $0,27 \pm 0,31$ cm (min. 0,0; max. 1,3), the difference of SA is statistically significant ( $p = 0,008$ ;  $p < 0,05$ ). Time interval between CT and PET scan in days  $53,51 \pm 75,52$ , (min. 6; max. 429). Spearman correlation coefficient between time interval and LA difference is 0,294 ( $p = 0,019$ ;  $p < 0,05$ ). Spearman correlation coefficient between time interval and SA difference is 0,284 ( $p = 0,024$ ;  $p < 0,05$ ). The difference of NSCLC nodules is not statistically significant in the presence of infiltration (LA  $p = 0,052$ ; SA  $p = 0,672$ ;  $p > 0,05$ ).

## Conclusions

1. There is no statistically significant difference of LA in CT and PET. SA is statistically significant different. 2. The difference between both measurements depends on time interval between CT and PET scans. 3. There is no statistically significant difference of node size in CT and PET in the case of infiltration around NSCLC node.

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## DOXORUBICIN INDUCED TOXICITY IN SOLID TUMORS MANAGEMENT

*Jorune Suipyte, Inesa Bereisyte*

*Supervisor of the abstract: Domas Vaitiekus*

*Oncology & Hematology, Lithuania*

### Introduction

For more than fifty years anthracyclines remain as one of the most effective solid tumors and leukemias drug as its mechanism of action leads to DNA strand break and cell death. One of its agents - Doxorubicin (DOX) - has been proven to be one of the most effective anti-tumor agents in breast cancer treatment. Unfortunately recent studies have noticed significant and dose-dependent cardiotoxicity in cancer management. What is more, further combinations and higher dose usage are associated with greater incidence of cardiomyopathy. For this reason it is extremely important to constantly monitor (electrocardiography (ECG) and echocardiography) and follow breast cancer patients.

### Aim

The aim of this study is to assess the impact of chemotherapy drug agent Doxorubicin dose related factors on cardiotoxicity in a group of breast cancer patients treated with anthracycline based chemotherapy.

### Objectives

1. To indicate toxic events on cardiovascular system in a group of breast cancer patients treated with anthracycline based chemotherapy.
2. To evaluate heart function before and after treatment with Doxorubicin
3. To evaluate the relation between chemotherapy drug agent Doxorubicin dose intensity cardio toxic events caused by treatment.

### Methods

We retrospectively analyzed 29 (with medium age of  $57,4 \pm 14,0y$ ). patient histories who were receiving treatment in Lithuanian University of Health Sciences Kaunas Clinics Oncology – Hematology outpatient clinic in 2012. All of them received anthracycline based chemotherapy where one of the agents was Doxorubicin. Patients received multiple doses totaling 106.4 to 604.9 mg per square meter (mean, 231.2). We identified two groups – with and without risk factors for cardio toxic events.

The values were given with median  $\pm$  standard deviation. For medium quantitative indicators we used Mann-Whitney U test. For qualitative indicators determination we used Chi-square ( $\chi^2$ ) test, small sample size - the Fisher test. Statistically significant difference between the groups was considered, if the significance level  $p < 0.05$ . Statistical analysis was performed using IBM SPSS 20 program.

## Results

Our group has divided into two: with cardiovascular abnormalities (58.6%, n = 17) and without (62.1%, n = 18). While assessing the side effects of DOX, there were various ECG alterations: pQ interval prolonged 27.6% (n = 8), OT – 13.8% (n = 4), PQ and QT – 20.7% (n = 6). PV was noticed – 20.7% (n = 6), PP – 10.3% (n = 3), EX – 13.8% (n = 4). We noticed 58.6% (n = 17) patients who experienced abnormal cardiac function through chemotherapeutic treatment period in comparison with a group without (41.4%, n = 12).

While measuring a single dose of DOX, it was noticed that patients whose single DOX dose was <100mg experienced OT – 40% (n = 2), PQ and QT interval – 60.0% (n = 3), PV was noticed for 60% (n = 3), PP-20% (n = 1); for single DOX dose ≥100 mg- PQ longer for 33.3% (n = 8), OT – 8.3% (n = 2), EX – 16.7% (n = 4). Statistically significant difference between single dose of DOX and impact to cardiovascular system was noticed, p = 0.009.

For patients, whose total dose of DOX was <600mg, PQ interval was longer 30.8% (n = 8), OT – 7.7% (n = 2), PQ and QT – 23.1% (n = 6). For patients, whose total dose was ≥600 mg – OT – 66.7% (n = 2). Statistically significant difference between total dose of DOX and PQ and QT interval prolong on ECG, p = 0.38. While measuring the impact of total dose of DOX, patients whose total DOX dose was <600mg, PV was noticed for 19.2% (n = 5), PP – 7.7% (n = 2), EX – 15.4% (n = 4); ≥600 mg – PV was noticed for 33.3% (n = 1), PP – 33.3% (n = 1). There was no statistically significant difference between total dose and occurrence of arrhythmia, p > 0.05.

Results have shown that for patients without any risk factors (while analyzing PV, PP, EX) and being under treatment with DOX, there was no occurrence of arrhythmia – 100%, (n = 3); for patients with risk factors – 46.1% (n = 12): PV 23.1% (n = 6), PP 11.5% (n = 3). EX 11.5% (n = 3). There was no statistically significant difference between occurrence of arrhythmia and risk factors, p > 0.05. For patients, who have any risk factors, no cardiac function abnormalities were noticed – 100% (n = 3), for patients with risk factors – cardiac function abnormalities were noticed for 69.2% (n = 18). Statistically significant difference was measured between cardiac function abnormalities and risk factors, p = 0.045

## Conclusions

1. Cardio toxic events in a group of breast cancer patients treated with anthracycline based chemotherapy were differences found while analyzing PQ, OT, PQ; PV, EX and PP.
2. There was a significant difference noticed between patients (with risk factors) before starting treatment and further cardiac function abnormalities (0.045), nevertheless, there was no significant difference for occurrence of arrhythmia (p > 0.05)
3. Statistical significant difference noticed between single dose of DOX and side effect caused by treatment (p = 0.009) and no significant difference noticed for total dose.

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# EPITHELIAL-MESENCHYMAL TRANSITION IN DRUG RESISTANT EPITHELIAL OVARIAN CANCER

*Eglė Povilaitytė, Karolina Žilionytė, Jan Aleksander Krasko, Agata Mlynska*

*Supervisor of the abstract: Vita Pašukonienė*

*Vilnius University, National Cancer Institute, Lithuania*

## **Introduction**

Ovarian cancer accounts for about 3% of cancers among women, but it causes more deaths than any other cancers of female reproductive system [1]. Due to the lack of specific symptoms, about 70% of ovarian cancer cases are diagnosed in advanced stages, when five-year survival rate is less than 40% [2] and standard treatment (cytoreductive surgery and chemotherapy with platinum and taxanes) is often insufficient. It is known that ovarian cancer frequently tends to develop resistance to chemotherapy. That promotes tumor regrowth during or shortly after treatment. While adapting to drug influx, cancer cell are subjected to numerous molecular changes. Epithelial-mesenchymal transition (EMT) is a process that allows an epithelial cell to undergo multiple transformations that enable acquisition of mesenchymal cell phenotype, enhanced migration capacity and resistance to apoptosis [3]. Similar resulting changes suggest that drug resistant epithelial cancer cells might acquire mesenchymal properties, essential to avoid cell death and promote tumor growth and metastasis.

## **Aim**

The aim of this study was to determine the effect of acquired drug resistance on morphology and phenotype of model epithelial ovarian cancer cell line A2780.

## **Objectives**

The goals of this study were firstly to develop drug resistant sublines of ovarian cancer cell line A2780, than to investigate the changes in cells morphology and phenotype by measuring the changes in mesenchymal stromal cell biomarkers expression.

## **Methods**

Cell line A2780 was chosen as a model for investigation of drug resistance in ovarian cancer. Cells were maintained as monolayer in medium (RPMI) supplemented with 10% fetal bovine serum, 2 pmol/L L-glutamine and antibiotics (streptomycin and penicillin) at 37°C in a 5% CO<sub>2</sub> atmosphere.

Cell line was treated with different chemotherapeutic agents. The doses of the drugs were increased constantly with respect to resistance development. Different sublines were developed: A2780P, A2780Cis, A2780C, and A2780D, treated respectively with paclitaxel (up to 0,9 µg/mL), cisplatin (up to 50 µg/mL), carboplatin (up to 15 µg/mL) and doxorubicin (up to 5 µg/mL). The development of drug resistance was confirmed by testing the increase of the median lethal dose (LD<sub>50</sub>) in all treated sublines. Flow cytometry was used to assess the cancer mesenchymal phenotype by staining cells with monoclonal antibodies against surface proteins CD44, CD73, CD90, CD105 and ESA. The statistical data analyses were conducted in Microsoft Office Excel 2003 by calculating Student's t-test.

## **Results**

Drug resistance was confirmed by the increase of the median lethal dose (LD<sub>50</sub>) in all treated sublines: 2,7-fold increase in A2780P, 1,75-fold increase in A2780Cis, 3,1-fold increase in A2780C and more than 5000-fold increase in A2780D. Considerable transition to mesenchymal cell morphology was observed in drug resistant sublines treated with doxorubicin and cisplatin, whereas untreated cells maintain their epithelial morphology. Additionally, the major increase of characteristic mesenchymal cells markers expression was detected in A2780Cis and A2780D sublines. The expression of motility and invasiveness marker CD44 increased from 0% in original cell line to 64% in A2780D and 95% in A2780Cis. Expression of aggressiveness marker CD73 increased from 0% in A2780 to 52% in A2780D and 75% in

A2780Cis. Moreover, ESA marker expression increased from 13% in original cell line up to 88% in both resistant sublines.

### Conclusions

Our results imply that inducing drug resistance in model epithelial ovarian cancer cell line promotes EMT and thus may increase the aggressiveness and metastatic potential of resistant cells. By mimicking the development of acquired resistance in ovarian cancer patients, we provide a rationale for additional targeting of EMT pathways in order to avoid disease progression and spreading.

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## MICRORNA-449A IMPEDES THE GROWTH AND INVASION OF TUMOUR INITIATING CELLS IN EXPERIMENTAL BRAIN TUMOUR MODELS

*Kastytis Sidlauskas, Ningning Li, Sebastian Brandner*

*Supervisor of the abstract: Ningning Li*

*Division of Neuropathology, University College London, Institute of Neurology, United Kingdom*

### Introduction

Combinations of initial genetic mutations determine the phenotype of brain tumours (1). In our experimental murine models, the deletion of *Pten/p53* genes in the stem cells of subventricular zone gave rise to gliomas, whereas deletion of *Rb/p53* generated primitive neuroectodermal-like tumours (PNET) (1, 2). The results confirm that differentiation to glial or neural lineage depends on individual oncogenic signals.

### Aim

As these experimental tumours are highly different in their gene expression (2) we aimed at identifying the role of strong post-transcriptional regulators – microRNAs – in determining the malignant characteristics of tumour initiating cells.

### Objectives

1. Perform microRNA arrays on solid brain tumours with mutations in *Rb/p53* and *Pten/p53* genes.
2. Find putative targets responsible for the tumour invasive phenotype in cancer initiating cells *in vitro*.
3. Confirm the role of selected microRNA in regulating the brain tumour phenotype using murine brain tumour models.

### Methods

Neural stem/progenitor cells (NSCs) were isolated from the subventricular zone (SVZ) of mice with combinations of conditional gene mutations:  $p53^{lox/lox}$ ,  $Pten^{lox/lox}$ , or  $Rb^{lox/lox}$ . Neurospheres were recombined *in vitro* by adeno-cre recombinase, and transferred to laminin coated plates to form monolayers for quantification. MicroRNA arrays were performed on solid brain tumours.

## Results

We showed that microRNA-449a is upregulated in both experimental PNETs that originated from *Rb/p53* deleted stem cells of SVZ and *in vitro* recombined cells with the same mutations. Moreover, the analysis revealed that downregulation of microRNA-449 in *Rb/p53* cells increased invasiveness, proliferation and migration rates. However, it did not affect self-renewal and response to chemotherapeutic agents.

## Conclusions

Our study demonstrates that microRNA-449a is important in impeding the growth and invasion of tumour initiating cells. This is in line with our observation that the primary experimental PNETs are much less invasive in comparison to gliomas. Thus, the results suggest that microRNA-449a determines the invasive phenotype of the tumours. The role of the downstream targets of this microRNA is currently being investigated.

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## REGIONAL LYMPH NODE METASTASES OF COLORECTAL ADENOCARCINOMA – CORRELATION WITH CLASSICAL AND INNOVATIVE MORPHOLOGIC CHARACTERISTICS

*Jekaterina Sarmanova, Aleksejs Gololobovs*

*Supervisor of the abstract: Ilze Strumfa*

*Riga Stradins University, Latvia*

### Introduction

Despite the remarkable progress in the diagnostics, treatment and scientific studies of colorectal cancer (CRC), it still represents one of the most frequent malignant tumours not only in Latvia, but also in Western countries (1-3). Adenocarcinoma (AdCA) represents the vast majority of CRC (4). Regarding the outcome and the selection of treatment, presence and number of regional lymph node (LN) metastases (MTS) are of utmost importance. However, LN retrieval can be difficult and thus it represents a hot topic in research. The analysis of correlation between regional lymph node status and other characteristics would provide diagnostic protocols for preoperative assessment or in controversial cases.

### Aim

The aim of this study was to identify the association between the presence and extent of regional LN MTS and both classical and innovative tumour characteristics in colorectal adenocarcinoma.

### Objectives

1) In order to reach the set aim, a representative study group of colorectal adenocarcinoma cases was created by archive search. The inclusion criteria comprised morphologically verified primary colorectal adenocarcinoma while other carcinomas, non-epithelial and secondary tumours were excluded from the study. 2) The cancers were characterised by demographic, clinical and morphologic parameters as described in the Methods. 3) The correlations between pN and classic (cancer grade, invasion depth, histological type) and innovative (cancer volume, nuclear atypia, type of the invasive border) tumour characteristics were searched for.

## Methods

A retrospective study design was selected as appropriate. All consecutive patients who underwent colorectal cancer surgery with potentially curative intention were identified by archive search in a single clinical university hospital, 2011 – 2014. The following demographic, clinical and morphological data were studied: patients' age and gender; tumour characteristics by local spread (pT), regional lymph node metastases (N), distant metastases (M), grade (G) and resection line status (R) summarised into pTNMGR parameters (4,5); number of retrieved LN; presence and quantity of MTS in LN and in pericolonic fat as well as volume and localisation of the tumour. By light microscopy, histological cancer specimens were analysed to evaluate the nuclear atypia in three-tiered scale and invasive border (rounded versus streaming dissection). SPSS and CIA software was applied for descriptive and analytical statistics involving 95% confidence interval (CI) for proportions and means, interquartile range (IQR) and Pearson correlation.  $p < 0.05$  was considered significant.

## Results

The archive search yielded 429 cases of colorectal cancer including 373 adenocarcinomas. The study group comprised 51.9% women [95% CI: 46.8 – 57.0], and 48.1% men [43.0 – 53.2]. The median age of colorectal adenocarcinoma diagnosis was 71.0 year (IQR: 13). The AdCAs predominantly affected the distal part of large bowel – 61.3% [56.4 – 66.2] of cases were located in sigmoid colon and rectum. In 26.2% [21.7 – 30.7] of patients, the tumour was situated on the right side of colon. The tumours mostly were locally advanced, as pT3 comprised 51.1% [46.0 – 56.2] cases and T4: 32.4% [27.7 – 37.2]. Regarding grade, G2 was predominating 70.4% [65.8 – 75.0]. The regional lymph node status was following: pN0 was observed in 55.1% [50.0 – 60.1] cases, pN1: 26.6% [22.1 – 31.1] and pN2: 18.5% [14.6 – 22.5]. pN showed significant correlations with tumour volume ( $p = 0.019$ ), pT ( $p < 0.001$ ) and G ( $p < 0.001$ ). pT4 constituted 60.3% of pN2 [48.7 – 71.9], 37.4% pN1 [27.9 – 46.9] and 20.5% of pN0 cases [14.8 – 26.0]. G3 comprised 41.2% cases of pN2 [29.5 – 52.9], 22.0% of pN1 [13.8 – 30.1] and 9.8% of pN0 [5.7 – 13.9] AdCA. By tumour localisation, rectosigmoid AdCAs were N2 in 24.6% cases [19.7 – 32.2]. The invasive border showed streaming dissection in 70.6% [66.0 – 75.2] pN2 AdCA cases. In contrast, the border was rounded in 88.8% [85.6 – 92.0] pN0 tumours. There was significant association between LN MTS and high nuclear atypia ( $p < 0.01$ ).

## Conclusions

- 1) Surgically resectable colorectal cancer in our study group was diagnosed at the median age of 71 year. There was almost equal male and female proportion. It was characterised by predominant left-sided location.
- 2) The surgically treated colorectal adenocarcinomas were mostly locally advanced and of moderate grade.
- 3) Presence and extent of LN MTS is significantly associated with higher tumour volume ( $p = 0.019$ ), locally advanced spread reflected by pT ( $p < 0.01$ ), high tumour grade ( $p < 0.01$ ) and high nuclear atypia ( $p < 0.01$ ).
- 4) There is significant correlation between pN values and invasive border – pN0 cancers generally have rounded invasion border while high pN is associated with streaming dissection ( $p < 0.01$ ).

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# RETROSPECTIVE ANALYSIS OF PANCREATIC NEUROENDOCRINE TUMORS IN LOC, LATVIA 2004-2014

*Guna Berzina, Anna Labuce*

*Supervisor of the abstract: Dace Baltina*

*Riga Stradins University, Latvia*

## **Introduction**

Pancreatic neuroendocrine tumors are rare islet cell tumors that arise in the endocrine tissues of the pancreas (1,2); Although these tumors are rare, the incidence is rising. Usually the cases are delayed as the specific effects caused by tumor secreted hormones/peptides are not recognized or there are no hormone induced symptoms at all. (3,4) James C. Yao et al. established by stage median survival for patients with localized tumors is 124 months, with regional – 70 months and with distant disease were 23 months. (5)

## **Aim**

The aim of this prospective and descriptive study was to check the incidence, clinical signs, diagnosis and treatment of pancreatic neuroendocrine tumors.

## **Objectives**

To perform a literature survey on these rare tumors and to provide a study of cases in LOC, Latvia.

## **Methods**

Altogether 565 case histories on pancreatic tumors treated at Oncology Centre of Latvia, Riga East University Hospital from 01.01.2004. to 31.12.2014. were evaluated. 15 out of 565 were pancreatic neuroendocrine tumours.

## **Results**

Endocrine tumors comprised 2.65% of all pancreatic cancers. The average age of the patients at the time of diagnosis was  $54.7 \pm 12.9$  years. The average age for women at the time of diagnosis was 58,3 years but for men – 54,3 years,  $p < 0,208$ . Insulinomas comprise 13.3% of all endocrine tumors and were characterized by episodes of hypoglycaemia. These episodes were happening for ages (up to 7-10 years), till diagnosis was made. Laboratoric analysis showed elevated C-peptide level and low glucose level in the mornings, indicating excessive insulin secretion. The most common complain for patients with nonfunctional pancreatic tumour was abdominal pain observed 46.2% patients. Early diagnosis happened in altogether 46.2%, half of them did not have any symptoms. 46.2% had first-degree relatives with oncology. Tumor formation in 46.2% patients was localized in - pancreatic tail, 40.8% - in the head, in the body - 15.4%, only one (7,7%) - in isthmus. At the time of diagnosis only two patients (15.4%) had disease in stage Ia and four (30.8%) - Ib stage, two (15.4%) - IIa stage, stage III tumor in 1 patient (7.7%) and IV - four patients (40.8%). Three (23.1%) patients had metastases in the liver and only one also in the lungs. Tumors that arising in the pancreatic head and in the tail are of greater malignant potential, they are diagnosed in late stages. One patient with stage Ia had undergone tumor enucleation. Three (23.1%) patients (Ib and IIa stage) had pancreatoduodenal resection (saving pylorus). Three patients with stage IV had symptomatic treatment. The remaining 10 (76.9%) patients had dynamic observation.

## **Conclusions**

Endocrine pancreatic tumors in Latvia are rare, compiling only 2.86% of all pancreatic tumors. The most common are nonfunctional pancreatic tumors and insulinomas. In early (Ia) stages of tumor there can be made enucleation but most often for stage Ib choose to make pancreatic resection with preservation of the spleen. Almost half of the patients were diagnosed late, when the only therapy possible is symptomatic one, that's why preventive diagnostics of patients over 45 years of age are needed. Also development of novel therapeutic approaches is needed.

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## THE COMPARISON OF NEPHROMETRY SCORES: R.E.N.A.L., P.A.D.U.A., C-INDEX AND THEIR VALUE IN PREDICTING POSTOPERATIVE OUTCOMES FOLLOWING NEPHRON-SPARING SURGERY

*Matas Juškevičius, Rytis Bliūdžius*

*Supervisor of the abstract: Algidas Basevičius, Ramūnas Mickevičius*

*Department of Radiology, Lithuania*

### Introduction

Due to asymptomatic nature of small renal masses, they are most oftenly diagnosed at a stage, when Nepron-Sparing Surgery can not be performed. However, every year an increase in accidentally diagnosed tumours, for many of which resection is still a viable option, is observed. Assessing the complexity of a tumour is not standardized, thus various nephrometry scores were proposed for evaluating renal masses and providing a comprehensive description of their size, location, growth, relations with other structures. These scores could assist in selecting the extent of a surgery, precisely quantifying the risk of complications.

### Aim

To determine which nephrometry system is the most reliable in predicting the clinical outcomes after partial nephrectomy (PN) in patients, that underwent surgical treatment at Hospital of Lithuanian University of Health Sciences (LSMU) Kaunas Clinics, Department of Urology.

### Objectives

1. To assess the relationship of R.E.N.A.L., P.A.D.U.A. and C-Index scores with the risk of postoperative complications.
2. To test whether these scores correlate with perioperative parameters, such as: operative time, estimated blood loss, warm ischemia time (WIT).
3. To determine whether the scores have any associations with the length of hospital stay, percent change in creatinine level, pathohistological findings.

### Methods

This retrospective study reviewed 86 consecutive patients who underwent partial nephrectomy (including lumbotomy and laparoscopy approach) between January 2011 and December 2013 with available preoperative Computed Tomography (CT) images. These images were repeatedly examined and evaluated, assigning specific parameters for each nephrometry system and calculating the final scores. Both RENAL and PADUA systems involve scores from 1 to 3 assigned for tumour size and growth type. RENAL nephrometry system also includes nearness to collecting system, location in relation to polar lines, each graded from 1 to 3, anterior/posterior location, given A, P or X designation, hilar position, adding h. PADUA consists of location in relation to sinus lines, medial/lateral renal rim, renal sinus and collecting system involvement, each graded from 1 to 2, while C-Index is a ratio of the three-dimensional distance from the centre of a tumour to the centre of a kidney and tumour size.

Perioperative and postoperative data was collected from case records, describing complexity of a procedure and

patient's condition afterwards. The data was processed and statistically analyzed using IBM SPSS Statistics 20.0 and Microsoft Office Excel 2007.  $\chi^2$  (Chi square) and Spearman's correlation coefficient were used to check significant association between variables.

## Results

Overall this study included 86 patients, 58% of them were male, 42% female. Average age of the patients selected was 63.1 years (SD 12.3). Average tumour size was 3.16 cm (SD 1.18). 74% of tumours were renal cell carcinomas (RCC) (59.2% clear cell, 8.6% papillary cell and 6.2% chromophobe cell carcinomas). 26% were benign tumours, most of them – 13.5% were oncocytomas. 38.5% of renal masses were in the upper pole, 32.7% were midpolar, while 28.8% were in the lower pole of kidney.

Neither of the scores correlated significantly with postoperative-hospital stay-complications ( $n = 60$ ;  $P = 0.36$ ;  $P = 0.46$ ;  $P = 0.13$  – RENAL, PADUA and C-Index accordingly), as 43% of observed complications were infectious. However, we did find a significant correlation between RENAL nephrometry score and repeated procedures for the same kidney in 1 year ( $n = 86$ ;  $P = 0.027$ ); while PADUA ( $P = 0.071$ ) and C-Index ( $P = 0.099$ ) showed slightly lower level of significance. RENAL also demonstrated high reliability in foreseeing the length of operation ( $n = 41$ ;  $P = 0.038$ ), the length of hospital stay ( $n = 86$ ;  $P = 0.05$ ), and estimated blood loss ( $n = 29$ ;  $P = 0.046$ ), meanwhile other scoring systems were less accurate. None of the nephrometry scores correlated with warm ischemia time (WIT), percent change in creatinine level (before and after PN), presence of symptoms, ASA score or pathohistological findings (histological type, grade of differentiation, tumour margin of resection).

All nephrometry scores correlated precisely with each other and with the diameter of tumour ( $P < 0.01$ ), though their constituent parameters individually didn't show any significance, except sole RENAL and PADUA parameters, describing the involvement of collecting system, which showed correlations with late complications; Exophytic-Endophytic properties correlated with WIT (endophytic growth meant longer ischemia), and WIT had positive correlation with percent change in creatinine levels.

## Conclusions

1. This study found that RENAL score has significant relationship with late complications, while other scoring systems might need further research.
2. RENAL score showed higher confidence levels in predicting length of operation and estimated blood loss. None of the scores correlated with WIT.
3. No more associations were found, except for RENAL score and length of hospital stay. Although the inter-score correlation is confident, each of the scores has different prognostic value in determining certain clinical outcomes.

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# THE IMPACT OF RADIATION THERAPY ON DEVELOPMENT OF MYOCARDIAL ISCHEMIA, ELEVATED ARTERIAL BLOOD PRESSURE AND HEART RATE RELATED TO LOCALISATION OF TUMOUR AND PATIENT'S AGE

*Eglė Zelenkaitė, Tautvydas Baranauskas*

*Supervisor of the abstract: Dalia Skorupskienė*

*Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Department of Oncology, Lithuania*

## **Introduction**

Cancerous diseases become more often nowadays simultaneously more people are treated aggressively. Since usually older or immunosuppressed people discover malignancy they are more susceptible to complications that are related to treatment of cancer. Radiation therapy is usually the first-choice of treatment. Radiotherapy has many adverse effects to cardiovascular system that are taken into consideration before starting the treatment. However, the general impact of radiation therapy on myocardial ischemia, arterial blood pressure (ABP) and heart rate (HR) during the time of therapy are not widely explored. We believe that observation of electrocardiogram (ECG), ABP and HR during radiotherapy might have benefit for evaluating further risk of cardiovascular system complications.

## **Aim**

To explore the influence of radiation therapy on myocardium, arterial blood pressure (ABP) and heart rate (HR) according to localisation of radiated zone and the age of the patient.

## **Objectives**

1. To compare patient's ECG, ABP before and after the radiation therapy.
2. To compare the variation of ABP and heart rate before and after the treatment in different groups of age.
3. To compare the alteration of ABP and heart rate according to different localisations of the tumour.

## **Methods**

The 142 case-histories of in-patients' during year 2011-2013 of LSMUL KK filial Hospital of Oncology, Departments of Palliative and Conservative Oncology were randomly chosen. All patients were treated with radiation therapy. Later the retrospective analysis of selected case-histories was performed. A few factors were assessed: patient's age, localisation of tumour, performed ECG, measurements of ABP and HR. Patients were divided into four groups according to age (I –  $\leq 58$  yrs, II – (58; 68] yrs, III – (68; 72] yrs, IV >72 yrs). Age groups were created according to the 25, 50 and 75 percentiles. The four groups according to localisation were also formed (I – pelvic organs, II – abdominal organs, III – thorax, IV – others).

Statistical analysis was performed using SPSS Statistics 17.0 programme. To analyse the data test of normality (Kolmogorov-Smirnov test) was performed. In order to assess correlations among features paired Student's t-test and Wilcoxon test were used and nonparametric binomial test was performed to evaluate the significance of changes in ECG. The data is significant when  $p < 0,05$ .

## **Results**

116 case-histories included ABP measurement before and during or immediately after the radiotherapy. 78 case-histories contained calculations of HR prior to and following the radiation therapy. ECG was performed at least twice throughout the treatment in 36 cases.

Higher systolic ABP after radiotherapy was seen in 27 (23,3%) patients, higher diastolic ABP was observed in 23 (19,8%) patients, higher HR was found in 36 (46,2%) patients.

Lower systolic ABP after radiotherapy was seen in 70 (60,3%) patients, lower diastolic ABP was observed in 58 (50%) patients, lower HR was found in 28 (35,9%) patients.

The occurrence of ischemic modifications in ECG after radiotherapy was obtained in 16 (44%) patients. The binomial

test revealed statistically significant modification of ECG in 30% patients.

Radiotherapy had a significant impact on lowering both systolic and diastolic ABP in first age group ( $p = 0,026$  and  $p = 0,02$  respectively). The second age group revealed the significant decrease of systolic ABP ( $p = 0,024$ ); change of diastolic ABP was not statistically significant. Third age group did not show any significant modifications in ABP. The statistically significant decrease of systolic ABP was obtained in the oldest patients' group ( $p = 0,007$ ).

Statistically significant changes of systolic and diastolic ABP were only seen when radiotherapy was used for pelvic organs ( $p = 0,000$  and  $p = 0,016$  respectively).

None of the age or localisations group showed significant modifications in heart rate before and after the treatment.

### Conclusions

1. Statistically significant modifications of ECG showing ischemia occurred to 30% of patients. Decrease of both systolic and diastolic ABP was obtained following the radiotherapy.
2. Both systolic and diastolic ABP was decreased after radiation therapy among the youngest patients while the second age group and the oldest patients' group showed only systolic ABP reduction. Other ABP changes were statistically irrelevant. The modifications of HR were not statistically reliable among all age groups.
3. Radiation therapy to pelvic organs determined the decrease of ABP; however changes of ABP due to radiotherapy to other localisations were statistically irrelevant. The modifications of HR were not statistically relevant among all localisations.

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## OPHTHALMOLOGY SESSION

# AUTOMATED DETECTION OF CHARACTERISTIC DIABETIC RETINOPATHY CHANGES IN THE HAPIEE EYES OF LITHUANIA – INITIAL RESULTS

*Morten Hansen, Martynas Speckauskas, Irene Leung, Hongying Lilian Tang, Tunde Peto*

*Supervisor of the abstract: Tunde Peto*

*National Institute for Health Research Biomedical Research Centre at Moorfields Eye Hospital & University College London Institute of Ophthalmology, London, United Kingdom, Lithuanian University of Health Sciences, Medical Academy, Department of Ophthalmology, United Kingdom*

## **Introduction**

Of the World's 285 million people with visual impairment and blindness, diabetic retinopathy (DR) is the main contributing factor in 1%. (1) Regular DR screening of at-risk population has been shown to be an effective public health intervention for reducing the burden of disease in people living with diabetes mellitus (DM). The number of DM patients is set to increase from 171 million in 2000 to 366 million in 2030 (2), others predict it to be as high as 439 million (3). This will necessitate the establishment of new methods to offer fast and reliable eye screening based on digital imaging technology. Automated DR detection software analysing digital images could be one of the solutions to meet the increasing global burden for regular eye screening of people with DM. The automated software might be especially useful in low- middle income setting where the steepest increase in the number of patients with DM is predicted, but where the infrastructure is unlikely to be in place for the increased healthcare burden. The multi-centre HAPIEE study assesses the effects of alcohol consumption, dietary and psychosocial factors on health in Eastern Europe. As it has demographic and disease specific data and also retinal imaging, it provides an excellent opportunity to carry out automated image analysis on this population and analyse if it might be an appropriate addition to the current image analysis system.

## **Aim**

This study aimed to detect characteristic changes of DR on retinal images obtained for the HAPPIE (Health, Alcohol and Psycho-social factors in Eastern Europe) study through the usage of additional semi-automated software and compare the sensitivity of the software to human grading results. The software divided the study participants using their images only into two groups, one with DR (DR-group) and one without (non-DR group). Once the automated analysis was completed, the grading results were compared to that of human grading carried out at the Moorfields Eye Hospital Reading Centre (MEHRC) by the first author of this current paper.

## **Objectives**

The goal is to determine if software could take part in the regular eye screening service for diabetic retinopathy. Our work was to grade a population based cohort for DR and then compare our results with the ones from the computer software. Future aspects is to participate in fine tuning and further development of computerbased software to make the initial grading of DR in a screening service.

## **Methods**

Participants aged 45-64 were randomly selected from the population of Lithuania. Patients were examined at the Eye Clinic of Lithuanian University of Health Sciences, Kaunas, in 2006. Dilated 2-fields digital photography of the posterior pole were taken and the anonymised images were subsequently graded at Moorfields Eye Hospital Reading Centre, London, UK, for presence of diabetic retinopathy (DR), age related macular degeneration (AMD) and signs of optic disc damage in glaucoma. Once human grading was finalised, all images were analysed by purpose-build DR analysis software developed by in collaboration with University of Surrey, United Kingdom. The algorithms for the software have been published previously (4), but in summary, the software first analyses the image quality to be either sufficient or insufficient for further grading. Those deemed "insufficient quality" are sent for human grading immediately. Only those with sufficient quality are analysed further by the software for the presence/absence of DR related abnormalities. The final output for each image is a score of 1 for DR present and 0 for DR not present.

Therefore the software divides the study participants into two groups, one with DR (DR-group) and one without (non-DR group). The outcome from the software analysis was then subsequently compared to the final grade from human graders based on a one-for-one comparison. Statistical analysis was performed using Microsoft Excel 2010 (2010 Microsoft corporation) and SPSS version 22.0.0.0 (IBM, Worldwide).

## Results

In this current study 1014 participants were included; 2024 eyes had images taken. The initial results are presented in this abstract. Human graders detected 120 referable DR cases, of these were 101 mild non-proliferative, 11 moderate non-proliferative, 5 severe non-proliferative and 3 cases were proliferative DR. 47 cases were by human graded as ungradable cases due to insufficient image quality, of which the software agreed on all of them. Our initial results show that the sensitivity of the automated software in detecting DR changes was 0.89 (95% CI, 0.82-0.93). Specificity of 0.59 (95% CI, 0.55-0.62) These results are comparable to the standards established by the British Diabetic Association (Diabetes UK) that any screening program should reach a sensitivity of at least 80%. (5) There were 19 false negative cases, none of which met criteria for treatment for sight threatening disease. 18 of the cases were mild non-proliferative DR and 1 were moderate non-proliferative. The first author of this paper carried out the human grading of all study images and prepared the sample for the automated analysis. Once the analysis was carried out, it was again the first author's responsibility to match the two grading outcomes and carry out the statistical analysis. The automated image analysis therefore reduced the burden of human grading by 51%, with only the true positives and the ungradables remaining to be graded. Therefore it is not at a point where it could fully replace the human grader, but can substantially reduce the time requirement for human grading.

## Conclusions

The initial analysis shows robust and valid results, it reached a sensitivity to detect DR changes of 0.89, and only missed 19 DR cases of which none would have required treatment. At the moment the software can only detect abnormalities potentially related to DR, which is excellent for DR screening. For the software to be useful in population based studies, and for general screening purpose it will need to be able detect AMD and glaucoma as well. Therefore further development in the software needs to be done and more testing on larger samples before it could be used as a population based study image screening tool.

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## CHARACTERISTICS OF PROLIFERATIVE DIABETIC RETINOPATHY PATIENTS TREATED BY PARS PLANA VITRECTOMY IN LITHUANIA

*Emilija Rimkutė, Vidas Vainauskas*

*Supervisor of the abstract: Martynas Špečkauskas*

*Department of Ophthalmology, LSMU, Lithuania*

## Introduction

Diabetes mellitus (DM) is a disease caused by a disorder of carbohydrate metabolism, which leads to the increased (hyperglycaemia) or decreased (hypoglycaemia) concentration of glucose in the blood. Diabetes mellitus may develop

complications in various organs, including the eyes. The most dangerous of them: proliferative diabetic retinopathy - which causes specific changes in the retina. Standardized classification, regular monitoring and applied timely and adequate treatment help to stop the progression of retinal changes and prevent blindness. However it is important not only to control the changes in the eyes, but also to control DM.

### **Aim**

The aim of this research is to compare the change of clinical conditions of patients with proliferative diabetic retinopathy (PDR) treated by pars plana vitrectomies (PPV) in Lithuania during 2008- 2013.

### **Objectives**

1. To evaluate distribution of gender, age, DM types.
2. To evaluate the changes in the rates of common indications for PPV.
3. To find out the procedures used during PPV, rate of bleedings during the operation and successful removal of fibrovascular tissue.
4. To determine post-operative results during 6 months follow up.

### **Methods**

The retrospective analysis of health records included 651 patients, whom PPV was performed at Eye Clinics of Lithuanian University of Health Sciences and Vilnius University Hospital Santariškės Clinics during 2008-2013. Sex, age, type of DM, best corrected visual acuity (BCVA), intraocular pressure (IOP), procedures during PPV, post-operative condition were recorded. IOP > 21 mmHg was treated as increased. The data was distributed in 2008-2010 years and 2011-2013 years groups. For statistical analysis IBM SPSS ver. 20 was used. Normality assumption of continuous variables was checked using Kolmogorov – Smirnov test. In case of non-parametrical variables, medians and interquartile ranges (IQR) were calculated and Mann-Whitney U test was used to compare the data between two groups. Categorical variables were described by numbers of cases and rates, chi-square test was used to compare two groups. The significance level of 0.05 was chosen to test statistical hypotheses.

### **Results**

There were 651 PDR PPV cases during 2008 – 2013. There were 275 (42.2%) male and 376 (57.8%) female patients, median of age was 59 years. PPV was performed in 330 (50.7%) right eyes and 321 (49.3%) left eyes. There were 127 (39.2%) male and 197 (60.8%) female patients in 2008 – 2010 and 148 (45.3%) male and 179 (54.7%) female in 2011 – 2013 years ( $p > 0,05$ ). The median of age in 2008 – 2010 was 57.5 (IQR = 17) and in 2011 – 2013 was 59.0 (IQR = 15),  $p > 0.05$ . There were 30 (19.5%) cases of DM type I and 124 (80.5%) – type II in 2008 – 2010 vs 90 (32.0%) and 191 (68.0%) in 2011 – 2013, respectively ( $p = 0.005$ ). Indications for PPV in 2008 – 2010 vs 2011 – 2013 were: glaucoma 19 (5.9%) cases vs 36 (11.0%) cases ( $p = 0.018$ ), cataract 106 (32.7%) cases vs 135 (41.3%) cases ( $p = 0.024$ ), hemophthalmus 162 (50.0%) cases vs 217 (66.4%) cases ( $p < 0.001$ ), neovascularisation 203 (62.7%) cases vs 285 (87.2%) cases ( $p < 0.001$ ). Procedures performed during PPV in 2008 – 2010 vs 2011 – 2013 were: intravitreal triamcinolone injection 1 (0.3%) case vs 6 (1.8%) cases ( $p = 0.059$ ), bevacizumab injection 0 (0%) cases vs 11 (3.4%) cases ( $p = 0.001$ ), cryocogulation 55 (17%) cases vs 37 (11.3%) cases ( $p = 0.038$ ), silicone oil tamponade 16 (4.9%) cases vs 40 (12.2%) cases ( $p = 0.001$ ). Fibrovascular tissue was removed radically in 36 (11.1%) cases vs 69 (21.1%) cases ( $p = 0.001$ ). Bleeding during PPV in 2008 – 2010 was observed in 150 (46.3%) cases vs 191 (58.4%) cases in 2011-2013 ( $p = 0.002$ ). BCVA before PPV in 2008 – 2010 vs 2011 – 2013 was 0.04 (IQR = 0.12) vs 0.02 (IQR = 0.09),  $p > 0,05$ . Post-operative BCVA in 2008 – 2010 vs 2011 – 2013 was 0.02 (IQR = 0.06) vs 0.01 (IQR = 0.06),  $p > 0,05$ . 6 months after PPV BCVA in 2008 – 2010 vs 2011-2013 was 0.1 (IQR = 0.37) vs 0.06 (IQR = 0.34),  $p > 0,05$ . Increased IOP before PPV in 2008 – 2010 vs 2011 – 2013 was in 4 (3.5%) cases vs 17 (7.1%) cases ( $p > 0.05$ ). Post-operative increased IOP in 2008 – 2010 vs 2011 – 2013 was in 1 (0.3%) case vs 9 (2.8%) cases ( $p = 0.011$ ). 6 months after PPV increased IOP in 2008 – 2010 vs 2011-2013 was in 3 (3%) cases vs 36 (21.1%) cases ( $p < 0.001$ ).

## Conclusions

1. There was no statistically significant difference in age and gender distribution between 2008 – 2010 and 2011 – 2013 years. More patients with PDR before PPV had DM type I in 2011-2013 years than in 2008-2010.
2. In 2011 – 2013 patients with PDR had more glaucoma, cataract, hemophthalmus, neovascularisation as indications for PPV than patients in 2008 – 2010.
3. During PPV bevacizumab injection and silicone oil were used more often in 2011 – 2013 than in 2008 – 2010, but cryocogulation in 2011 – 2013 was used less. Fibrovascular tissue was removed radically but more bleedings during PPV were observed more often in 2011-2013 than in 2008-2010.
4. There was no difference in BCVA during 6 months follow up, however, more cases of increased IOP at 6 month visit after PPV were observed in 2011 – 2013 than in 2008 – 2010.

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## COMPARISON OF THE KNOWLEDGE ABOUT AGE-RELATED MACULAR DEGENERATION AND DIABETIC RETINOPATHY TREATMENT AMONG THE CITIZENS OF THE REPUBLIC OF LITHUANIA AND RUSSIAN FEDERATION

*Rūta Kinderytė, Elena Miroshnichenko, Gabrielė Vyčienė*

*Supervisor of the abstract: Jūratė Balčiūnienė*

*Department of Ophthalmology, LSMU, Lithuania*

## Introduction

The primary disability as a result of retinal diseases is 15-25 percent in Russia and takes from 4th to 5th place among all ocular pathologies. Diabetic retinopathy (DR) is the leading cause of blindness and visual impairment among working-age population in developed countries. However, the leading cause of visual loss among the elderly patients in developed countries is age-related macular degeneration (AMD). The prevalence of AMD among human population is the third largest in the structure of eye diseases in elderly patients after glaucoma and DR. It leads to a rapid loss of central vision and disability. On the contrary, the initial stage of DR is not accompanied by visual disturbances, so when patients decide to conduct the ophthalmologist, usually it is too late to provide efficient treatment. The level of the ophthalmic dispensary observation of patients suffering from diabetes and the patients' knowledge about such diseases remains unsatisfactory even in well-developed countries.

## Aim

Assess people's knowledge about AMD and DR treatment and the changes of knowledge depending on age, sex, education, profession, place of residence and related diseases among the citizens of the Republic of Lithuania (RL) and Russian Federation (RF).

## Objectives

1. Assess the level of knowledge of the citizens of the RL and RF regarding AMD and DR treatment among different age groups, gender, education level, gained medical education (medical students and doctors), place of residence and current medical condition.
2. Detect risk groups among the citizens of the RL and RF with insufficient knowledge about AMD and DR.

3. Suggest the ways of improving knowledge about AMD and DR among the citizens of the RL and RF.

### Methods

Prospectively interviewed representatives of various age groups, gender, education, place of residence in the RL and RF. A questionnaire surveys were launched from November, 2014 to February, 2015. 500 questionnaires were distributed in the RL, 393 were returned. 200 questionnaires were distributed in RF, 120 were returned. People were interviewed about their age group, gender, education and current medical condition. Special attention was paid to the questions about AMD and DR treatment. Statistical analysis and calculations were made using MS Excel 2010 and IBM SPSS 22.0 programs applied Student's T and Chi-square tests. Difference was statistically significant when  $p < 0,05$ .

### Results

Knowledge of AMD treatment was considered when chosen answer was injection into the vitreous also if in addition to this response noted lutein and zeaxanthin containing preparations and / or laser treatment. Knowledge of DR treatment was considered when were selected at least two of the following options-laser treatment, injection into the vitreous, good glucose control (HbA1c level<7%), blood pressure control.

In Russia all respondents had higher education, so that the level of knowledge was compared only with Lithuanians who had higher education 173 (44%).

60 (50%) of questioned Russians with higher education have knowledge about AMD and 105 (87,5%) about DR treatment.

18 (10,1%) of questioned Lithuanians with higher education have knowledge about AMD treatment. 48 (26,8%) of questioned Lithuanians have knowledge about DR treatment.

Russians statistically have significantly better knowledge about AMD and DR treatment respectively,  $p = 0,01$  and  $p = 0,02$ .

6 (10%) of questioned medical students and doctors in Russia have knowledge about AMD and 6 (5,,71%) about DR treatment.

7 (16,28%) of questioned medical students and doctors in Lithuania have knowledge about AMD and 38 (36,54%) about DR treatment.

There was no statistically significant difference between Russian and Lithuanian medical students and doctors knowledge about AMD treatment. However medical students and doctors in Lithuania have significantly better knowledge about DR treatment,  $p = 0,032$ .

As it is related to the knowledge considering AMD treatment among questioned Russians, the age group of 18-40 years old have significantly better knowledge in comparison to all other age groups,  $p = 0,002$ ; 48 (80%). The same applies to DR treatment,  $p = 0,001$ ; 86 (81,9%).

As it is related to AMD treatment among Lithuanians, the age group of 18-40 years old have significantly better knowledge in comparison to all other age groups,  $p = 0,047$ ; 36 (36,4%). The same applies to DR treatment,  $p = 0,026$ ; 40 (38,5%).

40 (52,6%) of questioned Russian females and 20 (45,5%) of questioned Russian males have knowledge about AMD treatment. 67 (88,2%) of questioned Russian females and 38 men (86,4%) of questioned Russian males have knowledge about DR treatment.

15 (10,7%) of questioned Lithuanian females and 3 men (7,7%) of questioned Lithuanian males have knowledge about AMD treatment. 40 (28,6%) of questioned Lithuanian females and 38 (20,5%) of questioned Lithuanian males have knowledge about DR treatment.

60 (52,6%) of questioned Russians and 17 (10,4%) of questioned Lithuanians who have knowledge about AMD treatment as well as 103 (90,4%) questioned Russians and 45 (27,4%) questioned Lithuanians who have knowledge about DR treatment have been living in the city permanently.

Russians who have been living in the city are more aware of the treatment of AMD and DR, respectively,  $p = 0,01$ ,  $p = 0,03$ .

78 (45,1%) of questioned Lithuanians and 52 (43,3%) of questioned Russians had at least one related disease (diabetes mellitus, ischemic heart disease, arterial hypertension).

36 (46,2%) of questioned Lithuanians and 8 (15,4%) of questioned Russians had knowledge about AMD treatment. The difference was statistically significant,  $p = 0,02$ .

10 (12,8%) of questioned Lithuanians and 4 (7,6%) of questioned Russians had knowledge about DR treatment. The difference is not statistically significant.

13 (7,5%) of questioned Lithuanians and 2 (1,7%) of questioned Russians suffer from diabetes mellitus. 10 (76,9%) of questioned Lithuanians and 1 (50%) of questioned Russians had knowledge about DR treatment.

### Conclusions

1. The knowledge about AMD and DR treatment among the citizens of the RL and RF depends on such factors as age, gender, education, place of residence, adjacent diseases. Lithuanian and Russian citizens of 18-40 age group have greatest knowledge about AMD and DR treatment. Among Russians both men and women more aware of the AMD and DR treatment than Lithuanians. Russian citizens with higher education have significantly better knowledge of AMD and DR treatment. However medical students and doctors in Lithuania have significantly better knowledge about DR treatment. Significantly better knowledge about AMD and DR treatment is among Lithuanians and Russians who have been living in the city. Lithuanians, having at least one related disease have better knowledge about DR treatment than Russians, who suffer from at least one related disease. Lithuanians suffering from diabetes mellitus have better knowledge about DR treatment than Russians, who suffer from the same illness.
2. The risk groups among the citizens of the RL with insufficient knowledge about AMD and DR are people with higher education, medical students and doctors, age group of 18-40 years, patients with at least one related disease and people living in the village. The risk groups among the citizens of the RF with insufficient knowledge about AMD and DR are medical students and doctors, patients with at least one related disease and people living in the village.
3. The ways of improving knowledge about AMD and DR among the citizens of the RL and RF are informational AMD- and DR-dedicated posters in hospitals, notepads with informational AMD- and DR-dedicated flyers given to doctors and medical students, AMD- and DR-dedicated flyers given to patients with related diseases.

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## COMPLAINTS OF PATIENTS WITH GLAUCOMA AND THEIR FAMILY MEDICAL HISTORY

*Rūta Kinderytė*

*Supervisor of the abstract: Loreta Kuzmienė*

*Department of Ophthalmology, LSMU, Lithuania*

### Introduction

Glaucoma is one of the most common diseases that might cause irreversible visual impairment and blindness. Glaucoma is characterized by progressing optic neuropathy with optic nerve damage, visual field defects, and severe deterioration of vision in advanced stage. Family history is one of the strongest glaucoma risk factors. In the early stages of the disease, patients usually have no specific complaints. Complaints about the visual impairment usually occur only in the advanced stage of the disease. Reduction of intraocular pressure is the single approved glaucoma treatment which can be achieved by topical medical treatment, laser or surgical procedures. Treatment is started with topical medications. If the target pressure is not achieved, laser or surgical intervention might be proceeded. Most of the patients, who are treated with topical IOP-lowering medications, may have local or systemic side effects.

Glaucoma patients can experience complaints not only related to deterioration of visual function but also to local or systemic side effects of medical treatment.

### **Aim**

To assess family history of glaucoma patients with primary open-angle glaucoma and ocular symptoms, according to the stage of glaucoma and the number of prescribed medications.

### **Objectives**

1. To assess visual acuity, intraocular pressure, age, when glaucoma was diagnosed and stage of the disease in patients with primary open-angle glaucoma.
2. To assess patient's complaints, according to the stage of glaucoma.
3. To assess patient's complaints in relation to the number of used medications.
4. Evaluate patient's family medical history according to gender.

### **Methods**

The patients who visited Lithuanian University of Health Sciences Kaunas Clinics Ophthalmology department, glaucoma care unit in the period of 2014-02-03 to 2014-03-01 were prospectively examined and questioned. Study included patients with primary open-angle glaucoma. Research allowed collecting data about patients' visual acuity, intraocular pressure, glaucoma stage, number of prescribed medications. The survey was conducted considering previous patients complaints related to eye diseases as well as previously applied laser and surgical treatment. Patients were also interviewed about their relatives of first and second generations with glaucoma, indicating relatives' age when glaucoma was diagnosed. Statistical analysis and calculations were made using MS Excel 2010 and IBM SPSS 22.0 programs applied Student's T and Chi-square tests. Difference was statistically significant when  $p < 0,05$ .

### **Results**

124 patients who have been checked for glaucoma were interviewed - 113 (91,1 percent) with primary open-angle glaucoma (POAG), 4 - secondary pseudoexfoliative (3,2 percent), 6 (4,8 percent) – secondary traumatic and 1 (0,8 percent) secondary neovascular glaucoma. 113 patients with open angle glaucoma were included into the study. Patients age was  $65,20 \pm 11,97$  years. POAG patients' average age at the time of diagnosis was  $61,20 \pm 12,97$  years. The mean duration of the disease was  $4 \pm 4,1$  years. Initial visual field changes (both eyes I stage of glaucoma) were diagnosed in 60 (53,1 percent) of the patients – (1st group); moderate visual field changes (at least one eye stage II) - 36 (31,9 percent.) of the patients – (2nd group); advanced changes (at least one eye stage III or IV) - 17 (15 percent) of the patients – (3rd group). The 1st patients' group were at age of  $64,67 \pm 12,17$  years; the 2nd group –  $64,94 \pm 11,92$ ; the 3rd group -  $65 \pm 11,85$ . The average age when glaucoma was diagnosed for the patients of the 1st group was  $60,67 \pm 13,16$ ; for the patients of the 2nd group –  $60,94 \pm 12,93$ ; the patients of the 3rd group –  $61,03 \pm 12,86$ . Glaucoma was diagnosed for the 3rd patients' group statistically at significantly older age ( $p = 0,001$ ). Visual acuity: 1st patients' group OD- $0,5 \pm 0,05$ ; OS- $0,5 \pm 0,05$ ; 2nd patients' group – OD  $0,45 \pm 0,06$ ; OS- $0,4 \pm 0,05$ ; 3rd patients' group – OD  $0,19 \pm 0,04$ ; OS- $0,2 \pm 0,04$ . 3rd patients' group's visual acuity OD was significantly lower compared to the 1st and the 2nd patients' groups ( $p = 0,047$ ), there was no statistically significant difference in OS. The average of intraocular pressure: 1st patients' group – OD- $16,25 \pm 6,09$ ; OS- $16,54 \pm 7,44$ ; 2nd patients' group – OD- $18,29 \pm 6,14$ ; OS- $18,56 \pm 7,37$ ; 3rd patients' group – OD- $18,38 \pm 5,95$ ; OS- $18,66 \pm 7,3$ . The 2nd and the 3rd groups' OD and OS intraocular pressure were significantly higher than of the 1st patients' group ( $p = 0,036$  and  $p = 0,04$ ). 60 (53,2 percent) of the patients in all the group were treated with 1 drug; 34 (30 percent) with 2 drugs, 13 (11,5 percent) with 3 drugs, 6 (5,3 percent) with 4 drugs. The 1st patients' group used average  $1,4 \pm 0,3$  medications, the 2nd patients' group –  $2,3 \pm 0,5$ ; the 3rd patients' group –  $3,8 \pm 0,4$ . The number of medications was significantly higher among the patients with advanced stage of the disease (3rd group) 68 (60,2 percent) of POAG patients had no complaints. 10 (16,6 percent) patients with initial glaucoma (the 1st group), 22 (61,6 percent) patients with moderate glaucoma (the 2nd group) and 13 (76,5 percent) with advanced glaucoma had certain complaints. Patients with initial glaucoma (the 1st group) usually complained eye redness - 4/60 (6,7 percent), ocular discomfort - (stinging, burning, foreign body) 4/60 (6,7 percent) of

the patients. Impaired vision was mentioned by 8/60 (13,4 percent) of the patients. 6/36 (16 percent) of patients with moderate glaucoma (the 2nd group) complained of eye redness, 4/36 (11 percent) of ocular discomfort. Impaired vision was mentioned by 9/36 (25 percent) of patients. Patients with advanced glaucoma (the 3rd group) - 2/17 patients (11 percent) complained of eye redness, 5/17 (29 percent) – of eye discomfort and 9/17 (52 percent) of impaired vision. Among the patients using 1 and 2 drugs the difference in complaints of eye redness, discomfort (stinging, burning, foreign body) were not statistically significant. Patients using 3 and 4 drugs had significantly more complaints of ocular discomfort (stinging, burning, foreign body), ( $p = 0,032$  and  $p = 0,04$  respectively). However, the difference in complaints of ocular discomfort between the patients using 3 or 4 drugs was not statistically significant. 80 (70,8 percent) of POAG patients had the 1st and / or the 2nd generation of relatives with glaucoma. Family history of the female's gender: mother 31 (38,8 percent), sister 17 (21,3 percent), daughter 13 (16,3 percent), mother's mother 4 (5 percent), mother's aunt 8 (10 percent). Family history of the male's gender: father 10 (12,5 percent), brother - 11 (13,8 percent), son and father's father 2 (2,5 percent). Mix: mother's father 7 (8,8 percent), father's aunt 2 (2,5 percent), mother's father and mother's uncle 1 (1,3 percent).

### Conclusions

1. Early glaucomatous changes were mostly diagnosed among the study patients. There was no significant difference in the age of the patients in the different glaucoma stage groups. However, glaucoma was diagnosed at an older age for the patients with advanced glaucomatous changes.
2. Patients with early and moderate glaucoma had more complains of ocular surface irritation (eye redness, tearing, eye discomfort) than impaired vision; patients with advanced glaucoma more often complained of ocular surface irritation and impaired vision.
3. Patients' complaints about ocular surface irritation were associated with the number of used medication. Patients who have been using 3 or 4 drugs had significantly more complains of ocular discomfort.
4. Family history was common among the patients with open angle glaucoma and was significantly associated with female gender.

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## EVALUATION OF PEOPLE'S KNOWLEDGE ABOUT AGE - RELATED MACULAR DEGENERATION

*Gabrielė Vyčienė, Rūta Kinderytė*

*Supervisor of the abstract: Jūratė Balčiūnienė*

*Department of Ophthalmology, LSMU, Lithuania*

### Introduction

Age-related macular degeneration (AMD) is age-related retinal disease that affects macula and causes loss of central vision. World Health Organization estimates that age-related macular degeneration (AMD) ranks third among the global causes of visual impairment with a blindness prevalence of 8,7 percent. Disease is more prevalent in the population and mostly clinically manifests in older than 50 years of age people. AMD prevention and reduction of disease progression is an important task. The only one proven AMD risk factor is age. Lots of links were established with smoking, high blood pressure and inheritance. Other suspected risk factors are not finally approved. These are

obesity, female gender, solar exposure, inflammation and antioxidant deficiency. Disease progresses slowly, at the beginning person sees irregular images, distorted lines, objects may seem larger or smaller. Later, in the center of visual field dark stain might occur and vision gradually might deteriorate.

### **Aim**

To assess people's knowledge about age-related macular degeneration and the changes of knowledge depending on age, sex, education, residence and related diseases.

### **Objectives**

1. To assess the level of people's knowledge about age-related macular degeneration.
2. To evaluate and compare the impact of knowledge level of age-related macular degeneration considering age, gender, education, place of residence and adjacent diseases.

### **Methods**

Prospectively interviewed various age, gender, education, residence people. A questionnaire surveys were launched in 2014 November to 2015 February. A total 500 questionnaires were distributed, 393 returned. People were interviewed about harmful habits, eye diseases and other diseases. People were also asked about incidence of regular eye checks, nutrition and prevention of AMD (food supplements, blood pressure control, eye protection from the sun). People were interviewed whether they have any knowledge regarding AMD treatment. Statistical analysis and calculations were made using MS Excel 2010 and IBM SPSS 22.0 programs applied Student's T and Chi-square tests. Difference was statistically significant when  $p < 0,05$ .

### **Results**

The study involved 393 people, 311 (79,1 percent.) of respondents were female and 82 (20,9 percent.) were male. 101 (25,7 percent.) respondents had incomplete secondary and secondary education had, 113 (28,8 percent.) – higher non university and 179 (45,5 percent.) of respondents had high university education. 90,6 percent. of respondents live in the city, 9,4 percent. – in country side. Only 42 (10,7 percent.) of respondents knew that age-related macular degeneration is treated with intravitreal injections. 123 (31,3 percent.) of respondents answered that the age-related macular degeneration can be treated by laser, while 73 (18,6 percent.) indicated that age-related macular degeneration can be treated with lutein and zeaxanthin-containing preparations. Knowledge of age-related macular degeneration treatment was considered when chosen answer was injection into the vitreous as well as if in addition to this response noted lutein and zeaxanthin containing preparations and / or laser treatment was marked as appropriate. After the survey was found that 17 (15,3 percent.) older than 61 years old age group knew significantly more about age-related macular degeneration treatment that 37 (86 percent.) of women and 6 (14 percent.) of men knew about age-related macular degeneration treatment, difference between the genders was not significant,  $p = 0,237$ . 18 (41,9 percent.) of respondents with higher university – education knew better but not statistically significant about age-related macular degeneration treatment among different acquired education groups,  $p = 0,763$ . 18 (41,9 percent.) of pensioners, 1 (2,3 percent.) of students, 6 (9,2 percent.) medical students and doctors, 18 (41,9 percent.) – other professions responders had knowledge about age-related macular degeneration treatment. Pensioners knew significantly more about age-related macular degeneration treatment among other professions groups,  $p = 0,043$ . 161 (41 percent.) of respondents answered that dietary supplements might protect against eye diseases or stop the progression, but only 120 (30,5 percent) of respondents answered that every day or several times a week they use dietary supplements for eyes. There was no significant difference regarding knowledge of age-related macular degeneration treatment among respondents who use dietary supplements to the eyes and knowledge that is possible to stop the progression of age-related macular degeneration,  $p = 0,443$ .

### **Conclusions**

1. People's knowledge of age-related macular degeneration treatment is only 10,7 percent.
2. The level of knowledge about age-related macular degeneration treatment depends on age, profession and education. Older people (> 61 y.) know significantly more about age-related macular degeneration treatment.

Pensioners have significantly better knowledge regarding age-related macular degeneration treatment among other groups. People with higher university-education had better knowledge regarding age-related macular degeneration treatment among the groups of respondents with different level of education.

3. Knowledge regarding the age-related macular degeneration disease does not help to follow preventive measures.

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## OPTICAL AND VISUAL QUALITY OF EYES AFTER CATARACT SURGERY IMPLANTED WITH DIFFERENT INTRAOCULAR LENSES

*Rosita Lažaunykaitė, Dovilė Mitkutė*

*Supervisor of the abstract: Reda Žemaitienė*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Cataract is the leading reason of blindness in the world. The only treatment of this disease is surgery [1]. After cataract surgery the lens is replaced by an artificial intraocular lens (IOL), and the optical quality of the eye then is determined by the combination of corneal and IOL aberrations. Spherical aberration (SA) is one of the most important higher-order aberrations in the human eye [4]. The lens and the cornea of the human eye play an important role in determining the total ocular SA [2]. In healthy young individuals the negative SA of the lens is partially compensated by the positive corneal SA. With aging the SA of the lens becomes positive and added to the corneal SA [3]. After cataract surgery eyes implanted with spherical IOLs change optical quality because of increased positive SA [5]. An aspheric IOLs with negative SA compensate for the positive SA of the cornea [6]. Contrast sensitivity (CS) describes the ability to distinguish visual images of variable light-dark contrast. CS tests are efficient indicators of visual functions and can detect functional vision deficiencies that standard visual acuity tests are unable to identify [7].

### Aim

To evaluate and compare optical and visual quality of eyes after cataract surgery implanted with spherical AcrySof Natural and aspheric AcrySof IQ or Tecnis Z9000 IOLs.

### Objectives

1. To compare uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA) in patients with implanted AcrySof Natural, AcrySof IQ and Tecnis Z9000 IOLs.
2. To determine and compare values of SA, high-order aberrations (HOA), coma and trefoil aberrations between eyes with implanted AcrySof Natural, AcrySof IQ and Tecnis Z9000 IOLs.
3. To evaluate and compare CS between patients with implanted AcrySof Natural, AcrySof IQ and Tecnis Z9000 IOLs.

### Methods

Patients after cataract surgery were selected prospectively from August 2012 to December 2014. All surgeries were performed at the Lithuanian University of Health Sciences Kaunas Clinics Eye Clinic. In this study were included both gender aged less than 80 without any comorbidities patients. All the cataract surgeries were performed using the same standardized phacoemulsification technique and was implanted foldable, 1-piece, sharp-edged acrylic hydrophobic

IOLs. Patients were divided into three groups: I group (n = 35) with implanted spherical AcrySof Natural IOLs (SN60AT, Alcon), II group (n = 35) – aspheric AcrySof IQ IOLs (SN60WF, Alcon) and III group (n = 35) with Tecnis Z9000 (AMO) aspherical IOLs. Six to eight weeks after cataract surgery UCVA and BCVA were determined using the Snellen chart (Landolt's rings C optotypes). The wavefront aberrations of the whole eye were measured with NIDEK ARK-10000 Wavefront Analyser. CS function was measured with the Optec 6500 Vision Tester (Vision Sciences Research Corporation, California) at different spatial frequencies (1.5, 3, 6, 12, 18 cycles per degree (cpd)) by using different luminance level (3.0 cd/m<sup>2</sup> for night (mesopic condition) and 85 cd/m<sup>2</sup> for day (photopic condition)). All data analyses were performed using SPSS, version 22.0 program. Data are presented as mean ± standard deviation. P value less than 0.05 were considered statistically significant.

## Results

In this study were evaluated 105 eyes of 75 patients, 67.7% (n = 70) females and 33.3% (n = 35) males. The mean age of patient's was 73.4 ± 6.0 years. The mean postoperative UCVA was 0.77 ± 0.15 in I group, 0.87 ± 0.10 in II group and 0.90 ± 0.12 in III group. Statistically significant difference was found between I and III groups UCVA means (p < 0.05). The mean postoperative BCVA was 0.87 ± 0.07 in I group, 0.90 ± 0.08 in II group and 0.94 ± 0.05 in III group. BCVA was significantly higher in II and III groups compared with I group (p < 0.05). SA value in I group was 0.23 ± 0.08 μm, in II group – 0.09 ± 0.09 μm, in III group – 0.06 ± 0.05 μm. Coma aberration value in I group was 1.04 ± 0.71 μm, in II group – 1.02 ± 0.51 μm and in III group – 0.79 ± 0.46 μm. HOA value was 0.49 ± 0.21 μm in I group, 0.41 ± 0.15 μm in II group and 0.23 ± 0.07 μm in III group. Trefoil aberration value in I group was 0.45 ± 0.25 μm, in II group – 0.44 ± 0.12 μm and in III group – 0.26 ± 0.22 μm. Statistically significant differences of SA, HOA, coma and trefoil aberrations were found in I and II groups compared with III group. Also significant differences were found in SA and HOA in II group compared with I group. Functional CS under mesopic conditions at 6 cpd frequency in I group was 34.3 ± 28.8, in II group – 41.2 ± 24.8, in III group – 47.8 ± 24.1. At 12 cpd frequency in I group was 6.0 ± 4.9, in II group – 12.4 ± 7.9, in III group – 20.5 ± 13.1. CS under photopic condition at 6 cpd frequency in I group was 41.5 ± 24.6, in II group – 56.5 ± 29.3, in III group – 58.7 ± 41.7. At 12 cpd frequency – I group – 14.5 ± 8.2, II group – 34.9 ± 24.6, III group – 38.7 ± 32.5. Statistically significant differences were found at 6 and 12 cpd frequencies II and III groups compared with I group under mesopic and photopic conditions. At 12 cpd frequency under mesopic condition statistically significant difference was found in III group compared with II group. There were no statistically significant differences between groups at 1.5, 3 and 18 cpd frequencies.

## Conclusions

1. UCVA was statistically significantly better in patients with implanted Tecnis Z9000 IOLs compared with AcrySof Natural IOLs. BCVA was found the best with implanted Tecnis Z9000 IOLs compared with AcrySof Natural and AcrySof IQ IOLs.
2. SA and HOA were statistically lower in Tecnis Z9000 IOLs group compared with AcrySof Natural and AcrySof IQ IOLs groups. In AcrySof IQ group were statistically lower SA and HOA compared with AcrySof Natural group. Coma and trefoil aberrations were significantly lower in Tecnis Z9000 group compared with other two groups.
3. CS was found to be significantly higher in patients with implanted AcrySof IQ and Tecnis Z9000 IOLs compared to patients with implanted AcrySof Natural IOLs under mesopic and photopic conditions at 6 and 12 cpd frequencies. Also significant improvement was noted in patients with implanted Tecnis Z9000 IOLs compared to patients with AcrySof IQ IOLs under mesopic condition at 12 cpd frequency.

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## REFRACTIVE CHANGES AND RELATION WITH LIFE STYLE AND STUDY HABITS AMONG STUDENTS OF LITHUANIAN UNIVERSITY OF HEALTH SCIENCES MEDICAL ACADEMY – 3 YEAR FOLLOW-UP

*Lukas Šemeklis, Rosita Lažaunykaitė*

*Supervisor of the abstract: Reda Žemaitienė, Arvydas Gelžinis*

*Department of Ophthalmology, LSMU, Lithuania*

### Introduction

Students at university level represent a group of special interest due to a possible risk of developing adult-onset myopia or adult progression of myopia during studying. In recent studies an association between intensive studying, near work, reading, writing, studying habits, working on a computer, physical activity and myopia was observed [1-4]. Many studies agree that refraction errors are frequent among university students [5-9]. However, there were no any researches carried out about refraction errors and visual impairment of medical students in Lithuania.

### Aim

To evaluate changes in refractive status and possible relations with lifestyle and study habits among students of Lithuanian University of Health Sciences (LSMU) Medical Academy (MA) during 3 years of studies.

### Objectives

1. To assess changes of uncorrected visual acuity (UCVA), refraction (R) and axial length of the eye (AL) of LSMU MA students during a three-year period of studies.
2. To analyze LSMU MA students' lifestyle and study habits.
3. To find possible relations between lifestyle or study habits and changes in visual acuity, refraction and axial length of the eye.

### Methods

103 first year students of LSMU MA were randomly selected for a 3 years prospective cohort study. Participants were evaluated in the first, second and third year of their studies. All participants answered an original questionnaire of 44 questions about studying, reading, using computer or watching TV, dietary and water consumption habits, eye diseases, or complaints. For all participants UCVA, R and AL were measured. UCVA and R were repeated with cycloplegia and without. Cycloplegia was induced using 2 drops (in 5 minutes interval) of 1% cyclopentolate hydrochloride solution. Cycloplegic examination was performed after 25 minutes past last eye drop. UCVA was evaluated with Landolt C chart at 5 meters distance, AL was measured using ultrasound scanner Desmin M/USO (Optopol). Both subjective and objective clinical refraction was evaluated. Objective refraction was measured with auto refractometer TONOREF™ II (Nidek). Data analysis was performed with SPSS 21.0,  $p < 0.05$  was considered statistically significant.

## Results

103 students took part and 73 (70.9%) participants completed the study. Results were evaluated only of participants who have completed the study. The mean age was  $19.16 \pm 0.62$  years (male (N = 17; 23.3%) –  $19.47 \pm 0.72$ , female (N = 56; 76.7%) –  $19.07 \pm 0.57$ ). UCVA without cycloplegia in the first year in OD was  $0.69 \pm 0.39$ , OS –  $0.68 \pm 0.38$ ; in the second year in OD –  $0.70 \pm 0.38$ ; in OS –  $0.69 \pm 0.38$ ; in the third year in OD –  $0.69 \pm 0.38$ , OS –  $0.71 \pm 0.38$ . UCVA with cycloplegia in the first in OD was  $0.63 \pm 0.38$ , OS –  $0.59 \pm 0.38$ ; in the second year in OD –  $0.61 \pm 0.38$ ; in OS –  $0.61 \pm 0.38$ ; in the third year in OD –  $0.61 \pm 0.38$ , OS –  $0.60 \pm 0.38$ . There was no significant difference between UCVA observed. Objective R in the first year in OD 46.6% was myopic, 11.0% – emmetropic, 42.5% – hypermetropic, OS – 45.2% myopic, 11.0% – emmetropic, 43.8% – hypermetropic; in the second year OD – 43.8% myopic, 11.0% – emmetropic, 45.2% – hypermetropic, OS – 46.6% myopic, 8.2% – emmetropic, 45.2% – hypermetropic; in the third year OD – 41.7% myopic, 6.9% – emmetropic, 51.4% – hypermetropic, OS – 44.4% myopic, 5.6% – emmetropic, 50.0% – hypermetropic. From the first to the third year UCVA without cycloplegia in OD has decreased for 10 (13.7%,  $p < 0.01$ ) students, in OS – 8 (11.0%,  $p = 0.02$ ) students; with cycloplegia in OD has decreased for 17 (23.3%,  $p < 0.01$ ), in OS – 14 (19.2%,  $p = 0.01$ ). UCVA during 3 years period has decreased for 6 (8.2%) in both OD and OS (OD –  $p = 0.01$ , OS –  $p = 0.05$ ). The mean of subjective refraction for students with OD UCVA decrease without cycloplegia has changed in OD from  $-1.1 \pm 0.69$  D to  $-1.4 \pm 0.65$  D ( $p = 0.14$ ); in OS from  $-1.17 \pm 0.63$  D to  $-1.48 \pm 0.83$  D ( $p = 0.11$ ). The mean of subjective refraction for students with OD UCVA decrease with cycloplegia has changed in OD from  $-2.33 \pm 1.88$  D to  $-2.40 \pm 1.88$  D ( $p = 0.68$ ); in OS from  $-1.25 \pm 0.82$  D to  $-1.45 \pm 0.78$  D ( $p = 0.19$ ). Mean of AL in the first year of OD was  $23.92 \pm 1.02$  mm, OS –  $23.98 \pm 0.96$  mm; in the third year OD –  $24.01 \pm 0.95$  mm, OS –  $23.93 \pm 1.01$  mm. There was no significant difference between AL during the study. According to questionnaire, 17.8% read less than 1 hour per day, 20.5% – 1-2 hours, 13.7% – 2-3 hours, 23.3% – 3-4 hours, 24.6% 5 hours and more. 28.8% works with computer less than 2 hour per day, 27.4% – 2-3 hours, 28.8% – 3-4 hours, 15.1% – 5 hours and more. 74.0% watches TV less than 15 minutes per day and 26.0% – more than 15 minutes. 24.7% spends up to 6 hours daily indoor, 24.6% – 6-8 hours, 50.7% – stays indoor more than 8 hours per day. According to the questionnaire after 3 years 54.8% of students have complained that their vision possibly decreased despite UCVA or objective refraction changes during 3 years follow-up.

## Conclusions

1. UCVA has significantly decreased for 13.7% in OD and for 11.0% students in OS without cycloplegia and for 23.3% in OD and for 19.2% students in OS without cycloplegia. UCVA has significantly decreased for 8.2% students in both OD and OS. During follow-up statistically significant change of objective refraction was not observed, though number of hypermetropic has increased from 42.5% to 51.4% in OD and from 43.8% to 50% in OS. There was no significant difference between AL during the study.
2. LSU MA students mostly read more than 5 hours daily. Majority of students watch TV very rarely. More than half of students stay indoors more than 8 hours per day. Working with computer can be very different between LSU MA students.
3. There were no statistically significant relations between UCVA and R with students' life and studying habits.

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## RETINAL THICKNESS CHANGES AT DIFFERENT OCCURRENCES OF POSTERIOR VITREOUS DETACHMENT USING INTRAVITREAL INJECTIONS

*Ilze Lace, Liga Radecka, Eriks Elksnis*

*Supervisor of the abstract: Guna Laganovska*

*Riga Stradins University, Latvia*

### Introduction

Intravitreal drug delivery has become a popular method of treatment of many retinal diseases, commonly including age-related macular degeneration (AMD), diabetic maculopathy, and retinal vein occlusions. There have been studies that suggest that posterior vitreous detachment (PVD) may affect the result of intravitreal injection therapy. **(David T. Goldenberg, 2012)** [1,2]

### Aim

To research the changes of retinal thickness after intravitreal injections at different occurrences of posterior vitreous membrane in patients of PSCUH from 2013 - 2014 depending on various diagnosis.

### Objectives

To gather patients who have had intravitreal injections in PSCUH from 2013 - 2014, then select those, who had age-related macular degeneration, diabetic maculopathy or retinal vein occlusion, do the measurements. Perform data analysis and summarize the results.

### Methods

Retrospective research using patient ambulatory cards in PSCUH department of ophthalmology from 2013 -2014. The retinal thickness was measured using **Heidelberg Spectralis** optical coherence tomography (OCT). To collect and analyze data Excel:mac 2011 and IBM SPSS 21 was used.

## Results

From 229 patients, 159 patients who had had intravitreal injections from 2013 - 2014 were taken for further examination. The inclusion criteria were: patients who had received intravitreal injections because of AMD, diabetic maculopathy or retinal vein occlusion and therapy had been at least 6 months long. There were 101 (63.5%) women and 58 (36.5%) men with the median age of 75. They were divided into three groups depending on their diagnosis - age-related macular degeneration (wet form), diabetic maculopathy and retinal vein occlusion. Each patient group was then divided into patients who had no posterior vitreous detachment, complete posterior vitreous detachment (C-PVD) and partial posterior vitreous detachment (P-PVD). The retinal thickness was measured before the therapy and after 6 months of intravitreal injection therapy. There were 29 (18.2%) cases of diabetic maculopathy (7 (24.1%) C-PVD, 7 (24.1%) P-PVD and 15 (51.7%) with no PVD), 23 (14.5%) cases of retinal vein occlusion (9 (39.1%) C-PVD, 1 (4.3%) P-PVD and 13 (56.5%) with no PVD), 107 (67.3%) cases of age-related macular degeneration (32 (29.9%) C-PVD, 11 (10.3%) P-PVD and 64 (59.8%) with no PVD). In diabetic maculopathy cases after 6 month therapy retinal edema had lowered an average of 56.9  $\mu\text{m}$  (-9.43  $\mu\text{m}$  for C-PVD, 49.00  $\mu\text{m}$  for no PVD and 140.14  $\mu\text{m}$  for P-PVD), in vein occlusion cases 184.74  $\mu\text{m}$  (224.78  $\mu\text{m}$  for C-PVD, 172.23  $\mu\text{m}$  for no PVD and -13  $\mu\text{m}$  for P-PVD) and in AMD cases 138.92  $\mu\text{m}$  (143.72  $\mu\text{m}$  for C-PVD, 137.70  $\mu\text{m}$  for no PVD and 132.00  $\mu\text{m}$  for P-PVD). The statistical reliability was calculated using Kruskal-Wallis test. For diabetic maculopathy  $p = 0.068$ , for retinal vein occlusion  $p = 0.252$  and for age-related macular degeneration  $p = 0.934$ .

## Conclusions

At this point there is no statistical reliability that the result of intravitreal injections would be associated with or without the presence of posterior vitreous detachment. Further research should be done to exclude factors that may have had an effect.

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## **OTORHINOLARYNGOLOGY SESSION**

# A RETROSPECTIVE ANALYSIS OF DEEP NECK INFECTION PATIENTS PROFILE IN P. STRADINS CLINICAL UNIVERSITY HOSPITAL

Linda Veidere, Marks Ronis

Supervisor of the abstract: Gunta Sumeraga

Department of Otorhinolaryngology, Rīga Stradiņš University, Latvia

## Introduction

Deep neck space infections are serious and life threatening infections which occur in the spaces between the muscles of the neck. Anatomical structure of this region has a crucial importance at the development of the infection, complications and in the surgical treatment. Fast antibacterial and surgical treatment can prevent serious life threatening complications such as mediastinitis, thrombosis of the jugular vein and sepsis.

## Aim

To analyze patients' data from P.Stradins CUH who were hospitalized due to deep neck space infection; to reveal possible interconnection between age, gender, bacterial culture, surgical and antibacterial treatment and the outcome of the disease.

## Objectives

Select patient's records with deep neck infection as diagnosis or complication who were hospitalized in P.Stadins Clinical University Hospital's department of Otorhinolaryngology in the time period from January 2012 to December 2014. Select data about patients' age, gender, duration of hospital stay, month of hospitalization, diagnosis, complications, comorbidities, received antibacterial and surgical treatment, data about physical therapy for wounds, transfer to the ICU, reoperation, bacterial culture and antibacterial sensitivity/resistance and change of antibacterial therapy after the results of bacterial culture. Perform statistical analysis of data. Find out compatibility of the data. Analyse if it is statistically correct to adjust results to Latvia's population and other country data.

## Methods

A retrospective study using 64 patient's records with deep neck infection as diagnosis or complication in the period of 2012-2014. Statistical analysis was conducted using SPSS 19.0 software and  $p < 0,05$  was considered statistically significant. Descriptive statistics were used to determine if the data were normally distributed and to find out minimum, maximum, mean values and standard deviation; frequencies were used to determine most frequently discovered data and percentage. Chi-Square Test was used to discover if there is a relationship between two categorical variables. To compare differences between two independent groups we used Mann-Whitney U Tests. Spearman's correlations were used to measure the strength of association between two ranked variables.

## Results

64 patients were viewed retrospectively (53,1% men, 46,9% women), age from 20 to 86 (median age 56) years. Patients with dental infection most frequently are males ( $p = 0,037$ ). Average stay in the hospital was 14 days. Patients with acute tonsillitis ( $p = 0,0013$ ) and laryngeal stenosis ( $p = 0,02$ ) had a longer hospital stay. There is no difference between months of hospitalization ( $p = 0,544$ ). Most frequent diagnosis were acute phlegmonous laryngitis (43,8%), chronic decompensated tonsillitis (21,9%) and dental infection (12,5%). Complications – deep neck infection (85,9%), peritonsillar abscess (26,6%) and mediastinitis (12,5%). Comorbidities – primary arterial hypertension (21,9%), diabetes (12,5%) and coronary heart disease (12,5%). All patients received antibacterial therapy, most frequently of Metronidazole (48,4%), Amoxicilline/Clavulanate (46,9%) and Ceftriaxone (40,6%). Larger amount of antibiotics meant a longer hospital stay ( $p < 0,001$ , correlation coefficient 0,794). 61 patients received surgical treatment, 13 of them had reoperation. 9 patients received physical therapy for wounds. These patients had a longer hospital stay ( $p = 0,018$ ). Bacterial culture was taken from all patients who had surgical treatment, 19 patients' samples were positive. Most frequently found microorganisms were *Ac.baumannii* (12 times) and methicillin-sensitive coagulase negative *S.aureus*

(8 times). Most common antibacterial resistance was against Ceftazidime (17 times) and TMP/SMX (17 times).

### Conclusions

Deep neck infection affects men and women equally, usually in middle age. There is no statistical difference between months of hospitalisation. Patients with acute tonsillitis or laryngeal stenosis have a longer hospital stay although these are not the most frequent diagnosis. The most frequent diagnosis are acute phlegmonous laryngitis, chronic decompensated tonsillitis and dental infection. The most frequent complication is mediastinitis. Bacterial culture and antibacterial sensitivity plays a major role for correct antibacterial treatment of infection. If the phlegmon of the deep neck spaces has developed, surgical incision and drainage combined with aggressive antibacterial therapy is the treatment of choice.

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## DISTINCTIVE CHARACTERISTICS OF CLINICAL PROFILE OF SNORING AND OSA PATIENTS

*Edgaras Buržinskis*

*Supervisor of the abstract: Tomas Balsevičius, Guoda Pilkauskaitė  
Department of Otorhinolaryngology, LSMU, Lithuania*

### Introduction

Obstructive Sleep Apnea (OSA) is a multi-etiological disorder characterized by loud and irregular snoring and respiratory events with transient complete cessation or reduction of oronasal airflow during sleep.[1] Some general abnormalities (overweight) and local abnormalities of upper airway (enlarged tongue size, hypertrophied tonsils) are known to be responsible for development of respiratory events during sleep. OSA may be predicted based on individual anatomical features. On the other hand, there is evidence that clinical prediction model for OSA, derived

from a foreign population exhibits markedly different diagnostic characteristics from one that is developed locally, even though the overall accuracy is similar.[2] Therefore evaluation of distinctive characteristics of OSA patients are particularly important.

### **Aim**

To perform comprehensive evaluation of the snoring and OSA patients for their anatomical and clinical properties.

### **Objectives**

1. To assess the polysomnography (PSG) test results of patients, suffering from snoring and OSA.
2. To assess the relation between Body mass index (BMI) and local abnormalities of upper airway on OSA severity.
3. To assess the relation between OSA severity and accompanying diseases.

### **Methods**

Between January 2013 and December 2013 ninety-eight patients, 76 males and 22 females (mean age  $52,89 \pm 11,89$  years) underwent full night PSG at Sleep laboratory of LSMU and were selected to retrospective analysis. All clinical data was obtained from patients' histories and digital records. All clinical parameters were summarized by descriptive statistics and presented as mean  $\pm$  standard deviation. Differences between the groups were analyzed using Mann-Whitney's U test or Wilcoxon's test, if the data were not normally distributed, and the Student t test, if normally distributed.  $\chi^2$  tests were used to examine the relationships between the variables. Strength of relationship between the variables was measured by Pearson's two-tailed correlation test. A p value  $<0.05$  was considered to be a statistically significant.

### **Results**

According to the baseline Apnea hypopnea index (AHI) data obtained with the PSG, the study group consisted of 10 no-ringing, 13 mild, 18 moderate and 57 severe OSA patients. Mean AHI was  $41,70 \pm 31,58$ , mean SpO<sub>2</sub> during sleep was  $90,25 \pm 7,44\%$ , mean O<sub>2</sub> desaturation index was  $35,12 \pm 30,59$ , mean micro arousal index was  $41,84 \pm 27,65$ , mean Body Mass Index (BMI) was  $33,68 \pm 6,79$  kg/m<sup>2</sup> and mean Epworth sleepiness score was  $11,67 \pm 5,77$  points for the entire group of the patients.

Based on endoscopic clinical findings, 78 (79,6%) patients were described as Mallampati II°, 17 patients (17,3%) as Mallampati III° and 3 as Mallampati IV° patients. 9 (9,2%) patients presented with previously removed tonsils (Friedman 0), 66 (67,3%) patients presented with I° tonsillar hypertrophy (Friedman 1), 12 patients (12,2%) presented with II° tonsillar hypertrophy (Friedman 2), and 11 patients (11,2%) presented with III° tonsillar hypertrophy (Friedman 3).

48 (48,9%) patients also suffered from accompanying cardiovascular diseases.

According to the results of the correlation analysis some statistically significant strong and positive correlations were established among the patients' AHI and BMI ( $r = 0.622$ ,  $p < 0.01$ ).

According to the relationship analysis, patients with higher BMI showed the trend to suffer from severe OSA ( $p20$ ) ( $29,61 \pm 4,64$  v.s.  $35,49 \pm 6,83$ ,  $p < 0,001$ ).

Mallampati I°- II° patients showed to have lower AHI comparing to Mallampati III°- IV° patients ( $37,42 \pm 29,16$  v.s.  $58,39 \pm 7,99$ ,  $p = 0,007$ ). Same, Friedman 0-2 patients showed to have lower AHI comparing to Friedman 3 patients too ( $38,06 \pm 28,19$  v.s.  $70,54 \pm 42,53$ ,  $p = 0,001$ ).

Both, obese and severe OSA patients presented with relation to concomitant cardiovascular disease. While obese patients showed trend towards development accompanying cardiovascular diseases ( $p = 0,002$ ,  $\chi^2 = 14,687$ ), patients with severe OSA were statistically significantly more often effected by cardiovascular diseases contrary to patients, suffering from snoring or mild to moderate OSA ( $p = 0,002$ ,  $\chi^2 = 15,017$ ). Furthermore, OSA patients with concomitant cardiovascular disease had significantly higher AHI ( $51,34 \pm 30,94$  v.s.  $30,80 \pm 28,91$ ,  $p = 0.001$ ) and significantly higher BMI ( $36,23 \pm 6,96$  v.s.  $30,81 \pm 5,34$ ,  $p < 0,001$ ) comparing to OSA patients without concomitant cardiovascular pathology.

## Conclusions

1. Most of the present clinical sample patients presented with severe OSA. The strongest correlations were established among the patients' AHI and BMI, patients' AHI and micro arousal index and patients' O<sub>2</sub> desaturation index and micro arousal index.
2. Obesity, advanced position of the tongue (Mallampati III° and IV°) and hypertrophy of palatal tonsil's represents the risk to develop severe OSA.
3. Severe OSA patients are subject to develop concomitant cardiovascular pathology comparing to snoring and mild to moderate OSA patients.

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## NASAL BONE FRACTURES IN CHILDREN AND ADOLESCENTS. EVALUATION OF PLAIN FILM RADIOGRAPHY AS A DIAGNOSTIC METHOD TO DETERMINE TREATMENT TACTICS

*Marks Ronis, Linda Veidere*

*Supervisor of the abstract: Jānis Sokolovs*

*Rīga Stradiņš University, Latvia*

### Introduction

Nasal bones are the second most common site of fractures in the maxillofacial area in pediatric population. In adolescence, a nasal bone fracture pattern more closely follows that of adults. Nasal fractures are less common in very young children mostly due to underdeveloped nasal bones and other factors. Plain radiograph of the nose are difficult to interpret because of possible growth plate fractures and cartilaginous injuries. If an uncomplicated nasal fracture is suspected, plain film radiography is rarely indicated. Although these facts are well known to clinicians, ordering plain radiographs of nasal bones is an everyday practice among doctors in Children's Clinical University Hospital due to legal reasons but mostly because of pressure from patients' parents who in most cases will not allow the reduction of the fracture unless x-ray imaging is performed. In previous studies on nasal bone fractures, a pediatric population was seldom investigated as a separate group.

### Aim

To evaluate whether the plain film radiography is a necessary diagnostic procedure in children presenting with nasal trauma to determine further treatment in Children's Clinical University Hospital. To identify risk groups for nasal bone fractures in pediatric population in Latvia.

### Objectives

Select pediatric patients' records over a 3 year period with the diagnosis "Fracture of nasal bones". Collect data concerning patients' age, gender, month of hospitalization, etiology of the trauma, duration of hospital stay, radiographical diagnostic methods used and conclusions concerning these investigations, recieved treatment and complications. Perform statistical analysis of the data, comparing the numbers of treated and untreated patients in two groups - confirmed fracture on x-ray and no signs of fracture on x-ray. Conclude if plain film radiography of nasal bones has any value in the decision for reduction of the fracture. Identify any risk groups for nasal bone fractures in pediatric population in Latvia.

## Methods

Using retrospective study design records of 153 patients admitted to the Children's Clinical University Hospital Otolaryngology department with the diagnosis „Fracture of nasal bones” S02.2 (ICD-10) from 01.01.2012. to 31.12.2014. were studied and data was gathered. Statistical analyses were performed using SPSS software and  $p < 0,05$  was considered statistically significant. Cross tabulation with  $\chi^2$  test was used to evaluate the impact of plain x-ray imaging results on the decision for surgical reduction of the fracture by comparison of the numbers of treated and untreated patients in radiographically confirmed and unconfirmed groups.

## Results

120 (78,4%) patients were male and 33 (21,6%) were female. Patients were from 2 to 17 years old. The cause of trauma was obtained from 89 (58,2%) patients' histories. The most common cause was sports trauma 43(28,1%). Two groups of patients were compared based on whether or not they had surgical reduction of the fracture done. First group consisted of 38 patients who had no signs of fractures on plain film radiography. The second group included 92 patients who had radiographically confirmed fracture of nasal bones. Comparing the numbers of treated (34 in unconfirmed on x-ray and 92 in x-ray confirmed group) and untreated (4 in unconfirmed on x-ray and 7 in x-ray confirmed group) patients between both groups yielded no statistically significant difference between them ( $p = 0,296$ ). On the other hand comparing patients by the fact if they presented with visual deformity of the nose (114) or not (9) and did they receive treatment (7 in no deformity and 112 in visual deformity present group) or not (2 in no deformity and 2 in visual deformity present group) resulted in statistically significant difference between these groups ( $p < 0,001$ ).

## Conclusions

A risk group of nasal bone fracture patients in paediatric population in Latvia can be outlined – boys who do contact sports in their early teenage years. It is safe to conclude that plain x-ray radiography is unreliable for the evaluation of nasal fractures in children. Furthermore this study showed, that the decision for the surgical reduction of the fracture can be based on the fact that the patient presents with a visual deformity of the nose.

The ability to use facts and results of many studies to calm the patient and their relatives is a crucial skill that a medical professional who works with children should develop early on in their career. This research provides both the facts and results aimed at reducing needless irradiation of the patient, expense and wasted time.

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## TYMPANIC MEMBRANE PERFORATION ETIOLOGY, REPERFORATION AND TREATMENT STRATEGY IN CHILDREN.

*Ieva Rancāne, Jānis Lācis*

*Supervisor of the abstract: Jānis Sokolovs*

*Rīga Stradins University, Latvija*

### Introduction

Tympanic membrane is the border between the external ear and middle ear. Sound waves travelling through the ear canal swing the tympanic membrane, and it provides sound access to brain, where this movement is translated into sensation we understand as sound. [1] Tympanic membrane perforations can cause interference of this mechanism. Early tympanic membrane perforation detection is important so it does not interfere with the child's development. Untreated perforations can lead to hearing impairment. There are three major etiological factors that cause tympanic membrane perforations in children: traumatic tympanic membrane perforations, chronic otitis media induced

perforations and perforations that occur after myringotomy. [2]

### **Aim**

To summarize and analyze current information on tympanic membrane perforation etiology and therapy between children in Children's Clinical University hospital (CCUH) from 2003 – 2015.

### **Objectives**

Compile literature data about the most common causes of tympanic membrane perforation in children and tactics of treatment. To obtain data on the first and subsequent tympanic membrane perforations in children who were treated in the Children's Clinical University Hospital and the chosen treatment strategy. Perform data analysis. Summarize the results.

### **Methods**

A retrospective study using the CCUH information database was conducted. Patients were selected according to ICD-10 diagnosis codes H72. The study included patients with traumatic perforations, perforations after myringotomy and chronic otitis media induced tympanic membrane perforation. The following parameters were analyzed - age, sex, type of perforation mechanism and reperforation frequency depending on the primary mechanism of tympanic membrane perforation and chosen treatment strategy. MS Excel 2010 and SPSS software were used for data collection and processing.

### **Results**

There were 76 children with primary tympanic membrane perforation. They were divided into 3 groups depending on the etiology. More often perforations were as a result of injuries –there were 49 (64,5%) patients. 19 (38.8%) of these were girls and 30 (61,2%) boys. Median age in this group was 13 years. There were 18 (23.7%) patients with perforations after chronic otitis media. There were 8 (44.4%) girls and 10 (55.6%) boys in this group. Median age in this group was 7 years and 6 months. And in the last group there were 9 (11.8%) patients with a perforation that emerged after myringotomy. Of these, 5 (55.6%) were girls and 4 (44.4%) boys. The median age was 6 years and 7 months. Repeated tympanic membrane perforations were observed in 11 cases. 3 of them (25%) occurred after traumatic perforation of whom one was girl (33.3%) and 2 were boys (66.6%), 5 (41,7%) after chronic otitis media of whom 2 were girls (40%) and 3 were boys (60%) and 4 (33,3%) of them after myringotomy of whom incidence between girls and boys were the same - 2 girls and 2 boys (50%-50%). Reperforations more likely occur after chronic otitis media induced tympanic membrane perforations. ( $p = 0.002$ ). Surgical treatment received 65 (85,5%) patients, but therapy of antibiotics - 11 (14,5%) patients.

### **Conclusions**

1. Children tympanic membrane perforation more often is as a result of trauma. 2. More often repeated tympanic perforations are seen in children who originally have had perforation due to chronic otitis. 3. In adolescents most frequently tympanic perforations are due to trauma, but perforations after myringotomy most frequently are observed in the median age of 7 years and 6 months. Tympanic membrane perforations due to chronic otitis are more often seen in children with the median age of 6 years and 7 months.

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# VALIDATION OF LITHUANIAN VERSION OF HEARING HANDICAP INVENTORY FOR THE ELDERLY

Viktorija Jaruševičiūtė, Gabrielė Mačionytė  
Supervisor of the abstract: Giedrė Alzbutienė  
Otorhinolaryngology, Lithuania

## Introduction

Hearing loss for elderly may be less noticeable in a quiet office and in one-on-one conversation [1]. For screening purposes American Speech-Language-Hearing association recommends 10-item Hearing Handicap Inventory for the Elderly (HHIE) that can be given in less than 2 minutes and can help determine if audiologic evaluation is indicated [2].

## Aim

To validate Lithuanian version of Hearing Handicap Inventory for the Elderly (HHIE-LT).

## Objectives

1. To evaluate psychometric properties of translated and culturally adapted HHIE-LT.
2. To assess discriminatory power of HHIE-LT within patients and control groups and degree of hearing loss.
3. To evaluate usefulness of HHIE-LT for self-assessment of hearing loss in Lithuanian-speaking elderly population.

## Methods

Linguistic and cultural adaptation was made according to guidelines [3]. After getting the final version of HHIE-LT, it was administered by 74 subjects (51 female, 23 male whose mean age was  $75.5 \pm 5.7$  years). To all subjects otoscopy and pure tone audiogram was performed and bilateral auditory threshold  $\geq 25$ dB (average in 0.5, 1, 2 kHz) was considered to be a value that separates patients group from people without hearing loss (control group). To check test-retest reliability subjects were asked to fill HHIE-LT for the second time after 2 weeks period. To assess concurrent validity, participants completed the Lithuanian version of a health-related quality of life questionnaire the MOS Short Health Survey (SF-36) with the same subscales as HHIE (socio/situational-S, emotional-E)[4]. Content validity index at the item level (I-CVI) and at the scale level (S-CVI) were calculated. Internal consistency was measured using Cronbach's alpha. Test-retest stability was assessed using Wilcoxon test and split-half reliability. Concurrent validity between HHIE-LT and SF-36 was measured using Pearson correlation coefficient  $r$ . Discriminatory power was assessed by comparing mean rates (Student t-test). Correlation between the severity of hearing loss and the score of questionnaire was measured using Spearman correlation coefficient  $r$ . Cut point differentiating people with and without hearing loss was found by ROC analysis, sensitivity and specificity was counted.  $p < 0.05$  level was considered to be statistically significant.

## Results

After pure tone audiogram 44 subjects were found to have a hearing loss and 30 were assigned to control group. I-CVI for all items was more than 0.78 and S-CVI = 0.9 of the final version of HHIE-LT. The HHIE-LT showed high internal consistency and reliability (Cronbach's  $\alpha = 0.96$  for total scale, 0.92 for S, 0.91 for E subscales), and statistically significant high item-total correlations ( $r = 0.62-0.9$ ). There was no statistically significant difference within test-retest results over time ( $p = 0.2$ ). Split-half reliability for HHIE-LT was 0.95, Cronbach's  $\alpha$  for first half was 0.93 and 0.89 for the second. Concurrent validity was supported by a significant correlation between the scores of the emotional and socio/situational subscales of the HHIE to the analogous subscales of SF-36 ( $r = 0.43-0.46, p < 0.005$ ). Hearing-impaired subjects scored significantly higher ( $28.6 \pm 9.2$  points) than controls ( $1.6 \pm 2.3$  points) on HHIA ( $p = 0.005$ ). Construct validity was demonstrated by a strong correlation between the severity of hearing loss and the score of questionnaire ( $r = 0.86, p < 0.001$ ). A statistically significant difference was found between mean HHIE-LT rates and degree of hearing loss ( $p = 0.005$ ). Cut point differentiating people with hearing loss in HHIE-LT is 10 points (sensitivity 93%, specificity 99%).

## Conclusions

1. Translated and culturally adapted HHIE-LT is reliable and valid tool.
2. HHIE-LT has a robust discriminant validity within patients and control groups and degree of hearing loss.
3. The HHIE-LT is sensitive and specific tool for self-assessment of hearing loss in Lithuanian-speaking elderly people population.

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## VALIDATION OF LITHUANIAN VERSION OF SINGING VOICE HANDICAP INDEX

*Gabrielė Mačionytė*

*Supervisor of the abstract: Rūta Pribušienė*

*Otorhinolaryngology, Lithuania*

### Introduction

Singing Voice Handicap Index is a 36-item self-administered questionnaire (0-144 points) created for the assessment of singing voice related quality of life [1]. There was no specialised subjective method to measure singing voice problems in Lithuania.

### Aim

To validate Lithuanian version of Singing Voice Handicap Index (SVHI-LT)

### Objectives

1. To evaluate psychometric properties of translated and culturally adapted SVHI-LT.
2. To assess discriminatory power of SVHI-LT.
3. To evaluate eligibility of SVHI-LT for self-assessment of voice related quality of life in Lithuanian-speaking singers.

### Methods

Linguistic and cultural adaptation was made according to guidelines [2] including professional translators, re-translators, editors, ENT specialist committee and pilot study. After getting the final version of SVHI-LT, it was administered by 26 dysphonic (patients group) and 34 healthy singers (control group) who underwent multidimensional voice analysis. To check test-retest reliability subjects were asked to fill SVHI-LT for the second time after 2 weeks period. To assess concurrent validity, all participants completed the Lithuanian version of Voice handicap index (VHI) [3].

Content validity index at the item level (I-CVI) and at the scale level (S-CVI) were calculated. Internal consistency of SVHI-LT and its subscales (physical-P, functional-F, emotional-E) was measured using Cronbach's alpha. Test-retest stability was assessed using Wilcoxon test and split-half reliability. Concurrent validity between SVHI-LT and VHI was measured using Pearson correlation coefficient  $r$ . Discriminatory power was assessed by comparing mean rates of SVHI-LT between the groups (Student t-test).  $p < 0.05$  level was considered to be statistically significant.

## Results

I-CVI for all items was more than 0.78 and S-CVI = 0.97 of the final version of SVHI-LT. The SVHI-LT showed high internal consistency and reliability (Cronbach's  $\alpha$  = 0.96 for total scale, 0.91 for P, 0.88 for F, 0.90 for E subscales), and statistically significant moderate-high item-total correlations ( $r$  = 0.42–0.84) except 3 items which had weak item-total correlations ( $r$  = 0.21–0.39). There was no statistically significant difference within test-retest results over time ( $p$  = 0.15). Split-half reliability for SVHI-LT was 0.9, Cronbach's  $\alpha$  for first half was 0.93 and 0.94 for the second. Statistically significant moderate correlation ( $r$  = 0.56,  $p$  = 0.001) was found between SVHI-LT and VHI. There was a statistically significant difference ( $p$  < 0.001) between the mean scores of the dysphonic patients ( $58.5 \pm 20.7$  points) and control group ( $30.7 \pm 16.3$  points).

## Conclusions

1. Translated and culturally adapted SVHI-LT has high level psychometric properties.
2. SVHI-LT has high discriminatory power within healthy and dysphonic singers.
3. The SVHI-LT is considered to be a valid and reliable tool for self-assessment of voice related quality of life in Lithuanian-speaking singers.

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## PAEDIATRICS SESSION

# ANALYSIS OF NICE “TRAFFIC LIGHT” SYSTEM’S “AMBER” ZONE SYMPTOMS IMPORTANCE WHEN SUSPECTING SERIOUS BACTERIAL INFECTION IN FEBRILE CHILDREN LESS THAN 5 YEARS

*Karolis Zokas, Vaidotas Galaunė*

*Supervisor of the abstract: Algirdas Dagys*

*LSMU, Lithuania*

## **Introduction**

Febrile illnesses are one of the most common reasons for young children to present to primary care practitioners and may account for up to a third of presentations to emergency departments [1]. Depending on the setting, about 5–25% of fever episodes in young children are due to serious bacterial infections (SBI) [2]. The UK National Institute for Health and Clinical Excellence (NICE) published a guideline which provides a “traffic light” system for the initial assessment and management of young children with fever. Children whose clinical features fall within the „green“ zone are considered to be at low risk of serious illness, while those in the „amber“ and „red“ zones are at intermediate and high risk respectively [3]. Although it has been widely promulgated, the accuracy of this system’s “amber” zone criteria for the detection of serious bacterial infections has not been validated to date.

## **Aim**

To evaluate the importance of “traffic light” system’s “amber” zone symptoms, when suspecting SBI in febrile children less than 5 years

## **Objectives**

1. Determine the frequencies of clinical diagnoses among febrile children with amber zone symptoms.
2. Identify the association between „amber“ zone symptoms and SBI.
3. Compare the total number of „amber“ zone symptoms between SBI and other febrile disease group.

## **Methods**

1. A prospective study of febrile children under 5 years of age who were admitted to KK LHUS pediatric emergency department was performed. The diagnoses of ambulatory patients were verified by home phone calls. The study lasted from January 1, 2014 to April 1, 2014.
2. NICE “traffic light” system was implemented to the study. The system groups febrile children into 3 categories according to the probability of SBI: “green”, “amber”, “red”.
3. Study inclusion criteria:  $\leq 5$  years of age, axillary temperature  $\geq 38^{\circ}\text{C}$  measured at pediatric emergency department or at home within 24 h, a child who falls into the “amber” zone criteria of the NICE “traffic light” system [5].
4. Final diagnoses of patients were attributed to 2 groups: SBI, other causes of febrile disease (viral infection, bacterial infection, unspecified infection, non-infectious diseases). The total amount of “amber” symptoms per patient was also measured in each group.
5. Exclusion criteria: children transferred from another hospital, those with malignancy, transplant recipients, children who fell in “green” or “red” category zones of NICE “traffic light” system.
6. Statistical data analysis was performed using SPSS 20.0 software. Study data was compared using Pearson's chi-square ( $\chi^2$ ) test and Mann-Whitney test, with the standard level of the first type of mistake alpha (0,05).

## **Results**

1. Study cohort consisted of 258 cases, 51(19,8pct.) of them were caused by SBI, 207 (80,2pct.) were caused by other febrile diseases.
2. The most frequent diagnoses in the SBI group were: pneumonia 37 (72,5pct.), pyelonephritis 9 (17,6pct.), non-specified bacterial infection 3 (5,9pct.).

3. The most frequent diagnoses in other febrile disease group were: bronchitis 43 (20,8pct.), acute viral infection of the upper respiratory tract 41 (19,8pct.), pharyngitis 20 (9,7pct.), pharyngotonsillitis 17 (8,2pct.), tonsillitis 16 (7,7pct.), otitis 14 (6,8pct.), enterovirus 10 (4,8pct.).
4. The most frequent "amber" zone symptoms in the SBI group are: Crackles in the chest 24 (47,1pct.), Decreased activity 18 (35,3pct.), Dry mucous membranes 16 (31,4pct.), No smile 12 (23,5pct.), Pallor reported by parent/carer 11 (21,6pct.)
5. The most frequent "amber" zone symptoms in other febrile disease group are: Decreased activity 87 (42,0pct.), Dry mucous membranes 72 (34,8pct.), Crackles in the chest 53 (25,6pct.), Pallor reported by parent/carer 48 (23,2pct.), No smile 40 (19,3pct.), Poor feeding in infants 35 (16,9pct.), Reduced urine output 34 (16,4pct.), Tachycardia 31 (15pct.), SpO<sub>2</sub> ≤ 95pct. 27 (13pct.).
6. The total number of amber zone symptoms: mean of SBI group 2,5 ± 1,5 median 2,0; mean of other febrile diseases group 2,4 ± 1,6 median 2,0. Medians were compared using Mann-Whitney test, there was no statistically significant difference between them (p < 0,05).
7. Pearson's chi-square test indicated that crackles in chest were significantly associated with SBI group (p < 0,05).

### Conclusions

1. Respiratory tract infections were the most common among patients with "amber" zone symptoms. Pneumonia was the most frequent diagnosis in SBI group. The most frequent diagnoses in other febrile disease group were bronchitis and viral upper respiratory tract infection.
2. We assume that there are no "amber" zone symptoms closely associated with SBI, except crackles in the chest. Other "amber" zone symptoms are equally common to SBI and other febrile disease in our study cohort.
3. The total number of amber symptoms is the same in SBI group as in other febrile diseases group. As a result, the total number of amber symptoms can't be used to eliminate SBI from the diagnosis.

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## COMPARISON BETWEEN INITIAL AND FINAL DIAGNOSIS OF PNEUMONIA IN GROUP OF HOSPITALIZED CHILDREN

*Magdalena Czerzyńska*

*Supervisor of the abstract: Anna Justyna Milewska*

*Medical University of Białystok, Poland*

### Introduction

Anamnesis, physical examination and laboratory tests are needed to diagnose pneumonia. One of the most important of diagnosing method is chest radiograph because auscultation of the lungs is inadequate to make the best diagnosis.

### Aim

Comparison between initial and final diagnosis of pneumonia in group of hospitalized children.

### **Objectives**

The material of our study was data included in hospital report cards of children hospitalized because of pneumonia. Data was analyzed with Statistica 10.0 (Ch<sup>2</sup> Pearsona Test).

### **Methods**

The material of our study was data included in hospital report cards of children hospitalized because of pneumonia. Data was analyzed with Statistica 10.0 (Ch<sup>2</sup> Pearsona Test).

### **Results**

Initial diagnosis of pneumonia before hospitalization concerned 86 children (right-sided – 3, left-sided – 3, both-sided – 5, bronchial pneumonia – 13, unspecified pneumonia – 5, suspicion of pneumonia - 21). X-ray chest photo of 133 children confirmed diagnosis of pneumonia in 88% of patients (117 children): pneumonia – 86 children (86,9%), bronchial pneumonia – 10 children (76,9%), suspicion of pneumonia was bore out in 100% of cases. Initial diagnosis was in accordance with final diagnosis in group of 8 children with bronchial pneumonia (61,5%), 75 children with pneumonia (87,2%), 2 children with left-sided pneumonia (87,2%), 4 children with unspecified pneumonia (80%). 100% accuracy of initial and final diagnosis was observed when patient suffered from both-sided pneumonia and right-sided pneumonia (2 and 3 children).

### **Conclusions**

Initial diagnosis could be different from final diagnosis. Diagnostic tests which were made during hospitalization help to improve diagnosis. Initial diagnosis was in accordance with final diagnosis in more cases.

### **References**

List of references was not included.

## **EVALUATION OF CONSENSUS TEMPLATE (UTSTEIN) COMPLETENESS IN THE PEDIATRIC TRAUMA REGISTRY: A RETROSPECTIVE ONE PEDIATRIC TRAUMA CENTRE STUDY**

*Julija Martinovič, Aivaras Radžiūnas*

*Supervisor of the abstract: Virginija Žilinskaitė*

*Childrens' Hospital, Vilnius University, Lithuania*

### **Introduction**

Trauma is a leading cause of mortality and morbidity in pediatrics. Lithuania has the highest trauma-related mortality in the EU. Its assessment is either a worldwide and Lithuania problem. There is no standardized data base for severe trauma documentation, reporting and comparison among trauma centers in Lithuania. Initiation of shareable data base could improve management and outcomes of severely injured patients(1).

### **Aim**

Our aim is to assess feasibility and completeness of the international Utstein Trauma Template (UTT) in Children's Hospital, Affiliate of Vilnius University Hospital Santariskiu klinikos according the trauma centre registry data.

### **Objectives**

Evaluation of the trauma registry data in Children's trauma center of Vilnius region. Evaluation of completeness of Utstein Trauma Template variables in this registry.

## Methods

All trauma patients (age 0-18 y), admitted to Children's Hospital between 1 January 2010 and 31 October 2014, who met inclusion criteria: trauma during 48 hours before admitting to hospital, NISS  $\geq$  9 (New Injury Severity Score), were included in to the registry. Data were collected using UTT(2). Completeness of 35 UTT variables was evaluated. The UTT variables were divided into 4 groups: 1st group - patients and trauma characteristics – 6 variables; 2nd group - pre-hospital recorded variables – 11 variables; 3rd group - in-hospital recorded variables – 12 variables; 4th group - trauma outcomes related variables – 6 variables. Data completeness  $\geq$ 80% was set as the desired goal(3). Data was analyzed using Excel 2010 program.

## Results

444 patients were included, median age 8 years (0 to 17years), 68% boys, dominating type of injury – blunt (81%), dominating mechanism of injury traffic accident (35%), high and low energy fall (15%). Median NISS 12 (9 to 75). Of the 35 UTT variables 80% completeness was reached in 19 (54%), and 18 (51%) variables were >90% complete. First and fourth group variables were complete >98%. 80% completeness was reached in 27% of pre-hospital and in 33% of in-hospital variables. In-hospital variables lowest completeness was achieved in measuring arterial base excess (39%) and coagulation (INR) (18%). Main differences between pre-hospital and in-hospital variables completeness were observed in GCS, systolic blood pressure(SBP) and respiratory rate(RR) measurement: 21% vs 81% for GCS, 17% vs 75% for SBP, 9% vs 74% for RR. Completeness <50% was reached in variables related to timing of pre-hospital arrivals and in-hospital procedures accomplishment.

## Conclusions

Of the 35 UTT variables only 19(54%) were 80% complete. Analysis of the UTT core data demonstrated that the GCS, systolic blood pressure, respiratory rate and timing of arrival values were least complete in pre-hospital recorded variables and arterial base excess, coagulation and timing of procedures accomplishment in in-hospital recorded variables. Overall feasibility of collecting most of the UTT variability's was demonstrated. It would be reasonable to found a common data base based on the international Utstein Trauma template for the improvement of severe pediatric trauma care among Lithuania trauma centers.

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## EVALUATION OF HAND HYGIENE PREPARATION AND USED HYGIENE TOOLS IN DIFFERENT GROUPS OF PERSONNEL IN PEDIATRIC ONCOLOGY AND HEMATOLOGY DEPARTMENT IN YEAR 2014 – 2015

*Arnas Urbonavičius, Rūta Ratyte, Rūta Miškinytė*  
*Supervisor of the abstract: Dovilė Grinkevičiūtė*  
*Lithuanian University of Health Sciences, Lithuania*

## Introduction

Every year, a lot of children contract infectious diseases because of the spread of infections in hospitals. It is estimated that approximately 4,100,000 patients acquire a healthcare-associated infection in the European Union each year. [1] About 20–30% of healthcare-associated infections are considered to be preventable by intensive hygiene and control

programs. [1] Simple hygiene measures, including improved hand hygiene of healthcare workers in physical contact with patients has been recognized as a way to manage the spread of infectious diseases in child care centers. [2]

### **Aim**

To evaluate the compliance of hand hygiene preparation in different personnel groups of the Pediatric Oncology and Hematology department, located at Lithuanian University of Health Sciences hospital Kaunas clinics in year 2014 – 2015.

### **Objectives**

1. Evaluate how medical doctors follow hand hygiene preparation requirements. 2. Evaluate how nurses follow hand hygiene preparation requirements. 3. Evaluate the usage of different hand hygiene preparation tools within different personnel groups and different stages of hand hygiene preparation. 4. Evaluate how hand hygiene preparation requirements correlate with the time of the day.

### **Methods**

A prospective observational study was accomplished using International Nosocomial Infection Control Consortium hand hygiene performance monitoring methodology. Observational study was made in three different shifts during a day: in the morning between 8-12 am, in the afternoon between 12-16 pm and in the night shifts between 18-21 pm in Lithuanian University of Health Sciences hospital Kaunas clinic of Pediatric Oncology and Hematology department. The study took place without any notice to personnel regarding the task and lasted 60 minutes once a week per each shift. Six hand hygiene preparation requirements were evaluated in different groups of personnel: previous hand hygiene - if the observed personnel washed hands immediately before procedure or if they did not; hand hygiene before non invasive procedure (before any contact that does not violate natural defense barriers, such as skin and mucosa), hand hygiene before invasive procedure (before any contact that violates natural defense barriers, such as skin and mucosa); hand hygiene after body fluid exposition risk; hand hygiene after patient contact and hand hygiene after leaving patient's room. Also it was evaluated how hand hygiene preparation tools and requirement correlate with the time of the observation. The results were analyzed by using SPSS 22.0 software package and Microsoft Office Excel 2010. The descriptive statistics were applied. Data is presented in percentages.

### **Results**

During an observational study 688 cases were registered. Distribution among different groups of personnel: there were 440 cases involving nurses (63%) and 248 cases involving doctors (37%). Six hand hygiene preparation requirements were evaluated in different groups of personnel: previous hand hygiene (HH) was performed by 49,02% of nurses and 26,23% of doctors; HH before non invasive procedure - by 6,49% of nurses and 59,32% of doctors; HH before invasive procedure - by 80,65% of nurses and was not at all performed by doctors; HH after body fluid exposition risk - by 66,67% of nurses and there were no such cases with doctors; HH after patient contact - by 20,56% of nurses and 33,33% of doctors; HH after leaving patient's room - by 58,10% of nurses and 28,57% of doctors. With regards to the two types of hand wash (non-medicated soap (NM) and alcohol), 100% of doctors used only alcohol, and a slight majority of nurses used only alcohol (51%) followed by 36% for both NM soap and alcohol, and 12% only using NM soap. During the evening and morning hours, doctors were the most consistent with HH requirements at 46.00% and 45.45% respectively. During the afternoon hours there was a sharp drop to 27.54%. For nurses the afternoon showed the most consistency with proper HH at 52.72%, followed by a gradual decrease at the evening at 45.86%, and the morning at 31.15%. Overall 40,23% of hand hygiene cases were performed correctly by nurses and 36,29% by doctors.

### **Conclusions**

1. Doctors followed 1 out of 5 hand hygiene requirements more than 50% of the time, while other 4 requirements were followed less than 50% of the time. 2. 3 out of 6 hand hygiene requirements were met by nurses more than 50% of the time and the other 3 hand hygiene requirements were fulfilled less than 50% of the cases. 3. Overall, among doctors and nurses, alcohol is the preferred method for hand hygiene. 4. Our results show that among doctors, there

is an almost even percentage of proper hand hygiene during the morning and evening hours. Nurses exhibit a slow decline in proper hand hygiene from the best during the afternoon hours and the worst during the morning hours.

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## INFLUENCE OF PREDNISOLONE TREATMENT IN GROWTH OF CHILDREN WITH STEROID SENSITIVE NEPHROTIC SYNDROME

*Miglė Barauskaitė, Greta Juodviršytė*

*Supervisor of the abstract: Jūratė Masalskienė*

*Department of Pediatrics, LSMU, Lithuania*

### Introduction

Glucocorticoids remain the mainstay of therapy in steroid sensitive nephrotic syndrome (morphologic view minimal change nephropathy). It has been observed that therapy of glucocorticoids is associated with changes in bone and mineral metabolism. Patients receiving greater than physiological dose (> 7.5 mg of prednisolone per day) for 1 to 6 months duration are at risk of significant loss of trabecular bone in axial skeleton such as spine, hips and ribs.

### Aim

To evaluate an influence of steroids therapy applied for children, diagnosed with steroid sensitive nephrotic syndrome (SSNS) in growth and development of skeletal system.

### Objectives

1. To determine if anthropometric measurements, bone maturity age (BMA) and bone mineral density (BMD) depends on relapses frequency in children with steroid sensitive nephrotic syndrome.
2. To determine if anthropometric measurements, bone maturity age and bone mineral density depends on prednisolone treatment duration in children with steroid sensitive nephrotic syndrome.

### Methods

A prospective study was conducted in Lithuanian University of Health Sciences Kaunas Clinics Paediatrics department. All 53 cases of SSNS treated in Lithuanian University of Health Sciences (LSMU) Kaunas Clinics Paediatrics clinic during 2002-2013 years were included in the study. By the time of clinical evaluation (May 2014) 11 children became adults and could not be considered as children according to anthropometric charts, used in the study, and Dual-energy X-ray absorptiometry (DEXA) Z score could not be adapted for adults. Out of left 42 children 2 were diagnosed and confirmed by kidney biopsy with another glomerulonephritis type. 4 children were below 5 years old and their Bone Maturity Age (BMA) and Bone Mineral Density (BMD) could not be properly interpreted. 1 child lives abroad and could not participate in the study. Final set of patients was 35 children and 20 responded and agreed to take part in this study (57%). Anamnestic information about SSNS was gathered, anthropometric measurements were performed and converted into percentiles (pctl) (according to Tutkuvienė J. Evaluation of children growth and maturation (in Lithuanian)). Also X-ray of left wrist was applied to patients and evaluated BMA. DEXA of Lumbar spine (L3-4) was performed. All patients were during remission to avoid systemic interpretation errors. Statistical analysis

was performed using IBM SPSS Statistics 20.0. Mann-Whitney U Test and  $\chi^2$  test were used with significance level of 0.05.

## Results

Out of 20 patients, there were 11 male and 9 female. 14 children were first time attack or 5 or less time relapsers (Group 1), mean age  $9.35 \pm 0.8$  years. 6 children were 6 and more time relapsers (Group 2), mean age  $9.5 \pm 1.31$  years. Height and weight pctl were evaluated by making them into intervals of <3rd (below a norm), 3rd to 97th pctl (normal) and > 97th pctl (higher than a norm). Evaluating height and weight pctl there were no children being below 3rd at both groups. Normal pctl of height at group 1 - 7 children (50%), at group 2 - 5 children (83.3%) and more than 97th at group 1 - 7 children (50%) at group 2 - 1 child (16.7%).  $P = 0.16$  Normal weight at group 1 - 11 children (78.6%), at group 2 - 6 (100%). More than 97th pctl at group 1 - 3 children (21.4%) and at group 2 - 0 children.  $P = 0.219$ . Mean Z score at group 1 was  $0.49 \pm 0.23$ , at group 2 -  $0.33 \pm 0.19$ .  $P = 0.114$  Normal BMA at group 1 had 6 children, 6 had advanced and 1 had delayed. At group 2 out of 6, 3 children had delayed and 3 children had advanced BMA and none of them has got normal BMA.  $P = 0.044$ . At group 2 there was a significantly higher number of not normal BMA than at group 1. Patients were further classified according to months of prednisolone treatment. Group I - duration of prednisolone treatment was 10 or less months and Group II - more than 10 months. Those two groups had the same comparable values as the first ones. Out of 20 patients, 9 children were at group I. The mean age of this group was  $10.44 \pm 0.64$ . 11 children were included in the group II. The mean age of this group was  $8.54 \pm 1.4$ . Normal pctl of height at group I had 5 children (55.6%), at group 2 - 7 children (63.7%), >97th pctl at group 1 had 4 children (44.4%) at group 2 - 4 children (36.4%), <3rd - 0 at both groups.  $P = 0.714$  Normal weight at group 1 had 8 children (88.9%), at group 2 - 9 (81.8%). > 97th pctl at group 1 - 1 child (11.1%) and at group 2 - 2 children (18.2%), <3rd pctl - 0 at both groups.  $P = 0.66$  Mean Z score of DEXA at group I was  $0.57 \pm 0.28$ , at group II  $0.145 \pm 0.22$ .  $P = 0.172$  BMA at group I, 5 children - normal BMA, 4 - advanced and 0 - delayed BMA. At group II out of 10 children, 4 had delayed, 5 - advanced and 1 - normal BMA.  $P = 0.057$

## Conclusions

1. Frequency of relapses does not influence anthropometric measurements and BMD of children with SSNS, but increase the risk of having advanced or delayed BMA. 2. Duration of prednisolone treatment does not influence anthropometric measurements, BMA and BMD of children with SSNS.

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## ILLNESS OF NEWBORNS WITH EARLY-ONSET AND LATE-ONSET SEPSIS IN 2007-2009 PERIOD

*Viktorija Ambroževičiūtė, Karolina Eva Lesniakaitė*

*Supervisor of the abstract: Renata Dzikienė*

*Department of Neonatology, Medical Academy, Lithuanian University of Health Sciences, Lithuania*

## Introduction

Neonatal infection is a worldwide problem, according to World health organisation (WHO) the three major causes of neonatal deaths worldwide are infections (36%, which includes sepsis/pneumonia, tetanus and diarrhoea), pre-term (28%), and birth asphyxia (23%)[1]. As we see, neonatal sepsis causes high morbidity and mortality of newborns [2].

Full term newborns are more often ill with sepsis caused by group B streptococcus (GBS), whereas preterm newborns were more often ill with sepsis caused by other microorganisms[3].

### **Aim**

To evaluate the frequency of neonatal sepsis (early-onset (EOS) and late-onset (LOS)), the most common pathogens and the types of antibiotics which were used for treatment between different gestation and birth weight neonates.

### **Objectives**

1. To find out what was the most common pathogen for newborn sepsis from the year 2007 to 2009;
2. To evaluate the frequency of neonatal sepsis EOS and LOS, the most common pathogen and the most common antibiotics used for treatment between the different gestation newborns;
3. To evaluate the frequency of neonatal sepsis EOS and LOS, the most common pathogen and the most common antibiotics used for treatment between the different birth weight newborns.

### **Methods**

352 medical histories of newborns with neonatal infection, who were treated from the year 2007 to 2009 in LSMUL KK neonatology department, were analysed in retrospect but 12 histories lacked detailed data about the birth weight and gestation of the newborns. The data was analysed with the statistical software IBM SPSS statistics 22.0 applying nonparametric and  $\chi^2$  Tests ( $p < 0.05$ ).

### **Results**

Out of the analysed newborns, sepsis was diagnosed to 124 (36.5%). 73 (58.9%) of them had early-onset sepsis (up to 72 hours after birth) and 51 (41.1%) of them had late-onset sepsis (more than 72 hours after birth). 78 had microbiologically certified sepsis, 25 of them due to GBS. The most common microbiologically certified pathogen of sepsis – group B Streptococcus (GBS) ( $n = 25$ , 20.2%).

Out of the analysed newborns, 172 (50.6%) – newborns, which were born 37 or more weeks of gestation were the first group. Newborns with less than 37 weeks gestational age were divided into two groups: 113 (33.2%) – 32 weeks gestation or less – the second group, 55 (16.2%) – newborns with gestational age between 32 – 36 weeks – the third group. In the first group there was 59 (34.3%) newborns with sepsis, 30 (17.44%) out of them with EOS and 29 (16.8%) with LOS. In the second group there was 47 (41.6%) newborns with sepsis, EOS – 30 (26.5%), LOS – 17 (15%). 18 (32.7%) newborns in the third group had sepsis, 13 (23.6%) out of them had EOS, 5 (9%) had LOS. There was not statistically significant difference between sepsis diagnosis and newborns' gestation ages,  $p = 0.06$ . In the first group of newborns – 16 (9.3%) newborns had positive blood culture with GBS and 7 (4.1%) - Escherichia coli. The second group: 6 (5.3%) newborns had Staphylococcus aureus and 7 (6.2%) GBS, in the third group - 2 (3.6%) newborns had GBS and 2 (3.6%) - Escherichia coli. The first group newborns with EOS were treated with 2 different kinds of antibiotics, they were mostly treated with – penicillin and gentamicin, with LOS mostly treated with vancomycin in combination with other antibiotics. The second group newborns with EOS received treatment with 2 different types of antibiotics - penicillin and gentamicin, with LOS with above-mentioned antibiotics in combination with vancomycin. The third group received mostly vancomycin for EOS treatment, and ampicillin in other antibiotics combination for LOS. By birth weight newborns were divided into four groups. 45 (13.2%) newborns were especially low birth weight (less than 1000g) – the first group, 53 (15.6%) very low birth weight (1000-1500g) – the second group, 61 (17.9%) low birth weight (1500-2500g) – the third group, 181 (53.2%) weighed more than 2500g at birth – the fourth group. In the first group sepsis was diagnosed to 24 (53.3%) newborns, LOS to 10 (22.2%) newborns, EOS to 14 (31.1%). The second group - 22 (41.5%) newborns had sepsis, 15 (28.3%) - EOS 7 (13.2%) - LOS. In the third group 17 (27.9%) newborns had sepsis, 12 (19.7%) - EOS, 5 (8.2%) - LOS. In the fourth group newborns, sepsis was diagnosed to 61 (33.7%) newborn, EOS - 30 (16.6%), LOS – 31 (17.1%). There was statistically significant difference of illness with sepsis between birth weight in fourth group,  $p = 0.025$ . This result should be interpreted cautiously because of high number newborns weighed more than 2500g. The most common pathogen of sepsis in these groups is GBS, in the first group GBS was found in 3 (6.7%) newborns, in the second group – 4 (7.5%) newborns had Escherichia coli and 4 (7.5%) had GBS. In the third group 3 pathogens were identically common: Staphylococcus aureus, Streptococcus agalactiae, GBS, the

fourth group newborns mostly had GBS in their blood - 16 (8.8%) newborns. The first group of newborns with EOS mostly were treated with antibiotics combination of penicillin, gentamicin, cefotaxim and vancomycin, newborns with LOS mostly received treatment with vancomycin. The second and third group newborns regardless of sepsis type were treated with two kind of antibiotics - penicillin and gentamicin. The fourth newborns group with EOS were treated with penicillin and gentamicin, newborns in this group with LOS mostly were treated with ampicillin.

### Conclusions

1. Group B streptococcus was the most common pathogen of microbiologically certified sepsis .
2. There was not statistically significant difference between sepsis diagnosis and newborns' gestation ages. Newborn sepsis were diagnosed more in newborns group which were born 37 or more weeks. Most common positive blood culture in sepsis was GBS. Newborns with EOS in all three groups were mostly treated with penicillin and gentamicin. Newborns with LOS were mostly treated with vancomycin, usually in combination with other types of antibiotics.
3. Newborns with weighed more than 2500g at birth were diagnosed in sepsis more often. Most common positive blood culture in sepsis was GBS. Especially low weight newborns with EOS mostly were treated with combination of 4 antibiotics: penicillin, gentamicin, cefotaxim, vancomycin. That group of newborns with LOS were mostly treated with vancomycin. Very low and low birth weight newborns both, with LOS and EOS mostly received penicillin and gentamicin. Normal birth weight newborns received penicillin and gentamicin to treat EOS and ampicillin to treat LOS.

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## MODE OF DELIVERY AND NEONATAL OUTCOME IN EXTREMELY PREMATURE INFANTS

*Kristina Beržinytė, Aušrinė Zykaitė*

*Supervisor of the abstract: Rasa Tamelienė*

*Department of Neonatology, LSMU, Lithuania*

### Introduction

Preterm birth complications are the leading cause of death among children under 5 years of age [1]. The complications of preterm birth arise from immature organ systems that are not yet prepared to support life in the extrauterine environment. The risk of acute neonatal illness decreases with gestational age (GA), reflecting the fragility and immaturity of the brain, lungs, immune system, kidneys, skin, eyes, and gastrointestinal system [2]. In general, extremely premature infants (EPI), that are born under 28 weeks of gestation, have a bigger risk for complications and death. Preterm caesarean delivery reduces the chances of fetal or neonatal death and birth trauma [3], therefore it is discussed, whether mode of delivery - vaginal versus caesarean - is a predictor of poor neonatal outcome in EPI.

### Aim

To evaluate whether mode of delivery is a predictor of poor neonatal outcome in extremely premature infants.

## Objectives

1. To assess the relation between way of delivery and Apgar score, gestational age, inpatient treatment duration, neonatal mortality.
2. To compare complications of preterm birth for infants delivered through primary cesarean section versus vaginal delivery.
3. To assess the need of oxygen supplementation, continuous positive airway pressure (CPAP), and mechanical ventilation for infants delivered through primary cesarean section versus vaginal delivery.

## Methods

Data files of 86 preterm infants were examined retrospectively according to gestational age (under 28 weeks of gestation) and year of birth (2011 and 2012 year). All infants were born and treated in Neonatal Intensive Care Unit (NICU) of Hospital of Lithuanian University of Health Sciences. The data was collected using the database of NICU for extremely premature infants. The infants were grouped into two categories by mode of delivery: first group – vaginal delivery (VD), second group – caesarean delivery (CD). Outcome variables included, intraventricular hemorrhage (IH) (graded I to IV), patent ductus arteriosus (PDA), periventricular leukomalacia, hydrocephalus, sepsis (acquired and congenital), retinopathy of prematurity, bronchopulmonary dysplasia, necrotizing enterocolitis, neonatal death. Other examined data included: duration of oxygen supplementation (OS), continuous positive airway pressure (CPAP), and mechanical ventilation (MV); duration of inpatient treatment. The research data was processed and analyzed using MS Excel 2007 and IBM SPSS 20.0. P values less than 0,05 were considered as statistically significant.

## Results

86 medical cases were evaluated. 62 (72,1%) infants were born vaginally and 24 (27,9%) infants by caesarean delivery. Average gestation was  $25 \pm 1,42$  weeks. There was a statistically significant difference in mean gestational age between infants born by vaginal and caesarean delivery ( $24,95 \pm 1,41$  vs  $25,83 \pm 1,23$  weeks;  $p = 0,009$ ). Average inpatient stay was not significantly different between two groups.

Average Apgar score at 1st and 5th minute for VD infants was  $4,71 \pm 1,90$  and  $6,19 \pm 1,55$  points respectively, for CD infants -  $5,13 \pm 1,94$  and  $6,83 \pm 1,04$  points respectively. The Apgar score, divided into groups of  $\leq 3$ , 4-6 and  $\geq 7$  points, at 1st and 5th minute did not significantly differ between two groups of infants.

There were 21 (24,4%) cases of neonatal death. Neonatal death occurred significantly more often in vaginally delivered infants group (30,6% vs 8,3%;  $p = 0,031$ ).

Infants delivered vaginally were more often diagnosed with interventricular hemorrhage: 20 (66,7%) vs 9 (100%) infants were diagnosed with 1st and 2nd degree IH and 10 (33,3%) vs 0 infant – with 3rd and 4th degree IH,  $p = 0,045$ . Although there was no significant difference between the mode of delivery and patent ductus arteriosus, a higher rate of PDA was noticed for infants delivered vaginally. Mode of delivery had no significant influence on the occurrence of other neonatal complications like periventricular leukomalacia, hydrocephalus, patent ductus arteriosus, retinopathy of prematurity, bronchopulmonary dysplasia, necrotizing enterocolitis, congenital and acquired sepsis.

57 (75%) vaginally delivered infants and 19 (25%) born by caesarean delivery, needed oxygen supplementation, whereas 51 (76,1%) and 16 (23,9%) infants respectively needed mechanical ventilation,  $p > 0,05$ . Significantly more infants born vaginally required treatment with continuous positive airway pressure (52,9% vs 47,1%,  $p = 0,049$ ). Mode of delivery was not related to the duration of treatment with OS, MV or CPAP.

## Conclusions

1. According to gestational age, less mature infants were usually delivered vaginally. Neonatal mortality was higher among infants born vaginally. Apgar score and inpatient treatment duration were not related to the mode of delivery.
2. Vaginally delivered infants were more often diagnosed with interventricular hemorrhage. Mode of delivery was not associated with other preterm birth complications.
3. More infants born vaginally were treated with continuous positive airway pressure. Duration of treatment with OS, MV or CPAP was not related to the way of birth.

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## OVERVIEW OF CHILDHOOD ENDOCRINE TUMORS TREATED IN THE HOSPITAL OF LITHUANIAN UNIVERSITY OF HEALTH SCIENCES KAUNAS CLINICS (2000-2012)

*Viktorija Ivaškevičiūtė, Jorūnė Šuipytė*

*Supervisor of the abstract: Rosita Kiudalienė*

*Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Department of Pediatrics, Lithuania*

### Introduction

Endocrine tumors are those neoplasms arising from endocrine organs, regardless of whether they secrete hormones, and those tumors secreting hormones, regardless the tissue of origin (1). Endocrine neoplasia is rare in childhood, so its diagnosis and further management is challenging. Children typically present with clinical features of hormone excess or enlargement of an endocrine gland but diagnosis and management requires collaboration between the pediatric endocrinologist and oncologists, specialist surgeons, geneticists, pathologists, radiotherapists and other specialists working as a team in a specialist center (2). Primary care practitioners have little experience in diagnosing childhood malignancies and may be reluctant to consider the diagnosis because of the ominous implications. Nonetheless, they must be aware of common early signs and symptoms and the possibility of cancer should be evaluated when the initial signs and symptoms are suspicious. Early detection and treatment may reduce disease-related morbidity and complications (3). Because such tumors are extremely rare and groups are heterogenic, morbidity has been measured only in every group individually. Moreover, in Lithuania there is no such database available and this study is assumed to be the first one.

### Aim

To assess most frequent pediatric endocrine tumors and identify early symptoms linked to diagnosis.

### Objectives

1. To divide tumors into groups due to localization and indicate the most common ones; subdivide according to diagnosis and evaluate which is dominant.
2. To assess the age of symptoms' manifestation in different endocrine tumors groups.
3. To estimate the time from onset of symptoms to diagnosis.
4. To evaluate gender differences overall and in various groups.
5. To evaluate which symptoms are most common in all groups generally and in each group separately.

### Methods

The study population consisted of 85 patients with endocrine tumors. All patients were diagnosed or underwent treatment at the Hospital of Lithuanian University of Health Sciences (LSMU) from 2000 to 2012. 72 medical histories were fully completed and were included into retrospective analysis. For 2nd objective – only 61 patients met the criteria. For each selected patient, the database included information about: age, sex (girls – g; boys – b), endocrine tumor type, histological findings, first symptoms and time of manifestation (month – m; year – y). Patients were divided into five groups (group – G) according to localization of a tumor: group I – CNS tumors; group II – thyroid tumors; group III – adrenal tumors; group IV – ovarian tumors; group V – others. Statistical analysis was performed

using Microsoft Excel 2007 and SPSS 22.0 Frequency, mean, median and standard deviation were calculated. The permission of LSMU Centre of Bioethics was obtained before the initiated study: Nr. BEC-MF-449.

## Results

72 patients (49g, 68.1%; 23b, 31.9%) branched out into: group I – N = 38, 52.8% (24g, 63.2%); group II – N = 20, 27.8% (15g, 75%); group III – N = 7, 9.7% (5g, 71.4%); IV – N = 5, 6.9%; V – N = 2, 2.8%. Due to frequency of pathology the most common tumors were: craniopharyngioma (N = 19, 26.4%); papillary thyroid carcinoma (N = 13, 18.1%); adrenocortical carcinoma (N = 7, 9.7%); prolactinoma (N = 7, 9.7%); germinoma (N = 7, 9.7%). The mean of age when first symptoms occurred in group I (N = 35) was 10.17y, median 9,9y; II (N = 14) was 14.29y, median 15,2y; III (N = 7) – 8.3y, median 6,2y; IV (N = 5) – 13.4y, median 14,4y; The mean of time between the onset of symptoms and diagnosis was: group I – 18.26m (from 0m to 8.3y), median 7m; II - 9.3m (from 0m to 2.4y), median 8m; III – 8.6m (from 0m to 1.9y), median 3m; IV – 5 m (from 0 to 12m), median 1m. Due to frequency of first symptoms: tumor mass – N = 24, 33,3%; headache – N = 18,3%; nausea – N = 11, 15.3%; impaired vision – N = 11, 15.3%; polydipsia – N = 7, 9,7%; polyuria – N = 6, 8.3%; abdominal pain – N = 5, 6.9%; low height – N = 3, 4.2%; excessive sweating – N = 3, 4.2%. Accidental findings under observation of chronic pathology – N = 5, 7.0%. In girls population – menstrual disorders – N = 7, 14.3%; galactorrhea – N = 2, 4.1%. Due to frequency of first symptoms in group I – headache - N = 16, 42.1%, impaired vision – N = 11, 28.9%; II – tumor mass – N = 12, 60%; III – tumor mass – N = 4, 57,1%; IV – tumor mass – N = 5, 100.0%, abdominal pain – N = 3, 60%.

## Conclusions

1. CNS and thyroid tumors are the most frequently diagnosed tumors which cause endocrine disorders. In these groups craniopharyngioma and papillary thyroid carcinoma dominated. 2. In adrenal tumors group first symptoms manifested mainly in childhood; in CNS tumors group – in early adolescence; in ovarian and thyroid tumors groups – in juvenescence. 3. Ovarian tumors have been diagnosed fastest; CNS and thyroid tumors – longest. 4. Girls dominated in all four groups. 5. Most frequent symptoms in group I were headache and impaired vision; group II & III – tumor mass; group IV – tumor mass and abdominal pain.

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## RELATIONSHIP BETWEEN 2-6-YEAR OLD CHILDREN BODY MASS INDEX, PARENTS' BODY MASS INDEX AND PARENTAL EDUCATIONAL LEVEL

*Ieva Valančiūtė, Miglė Barauskaitė*

*Supervisor of the abstract: Natalija Smetanina*

*Lithuanian university of health sciences, Lithuania*

## Introduction

The prevalence of overweight and childhood obesity is rising in many developed and urbanized areas. Obesity is known to be a multi-factorial disorder originating from the interaction of genetic and environmental factors. Numerous studies have shown that the risk of becoming obese is higher in children whose parents are obese. Studies have also revealed a socioeconomic gradient in childhood overweight. Parental education as an indicator of socioeconomic state has the most consistent, inverse correlation with childhood overweight.

## Aim

To evaluate the relationship between the body mass index (BMI) of 2-6 year old children and the BMI and education level of their parents.

## Objectives

- 1.To evaluate the distribution of BMI of 2-6 year old children.
- 2.To evaluate the relationship between the BMI of 2-6 year old children and the parents' weight status.
- 3.To evaluate the relationship between the BMI of 2-6 year old children and the education level of their parents.

## Methods

A cross-sectional survey was performed in 4 kindergardens in Kaunas in period May-June 2014. Study included 206 children aged 2-6 years. Parental consent was obtained prior data collection. The questionnaire was filled in by parents.

The height was measured to the nearest 0.1 cm and body weight - to the nearest 0.05 kg. The BMI was calculated and converted to BMI percentiles (P), using BMI charts according to World Health Organisation (WHO). Children were divided into 4 groups according to their BMI, for evaluation of distribution: underweight (97th P). For further statistical analysis 2 groups were made: underweight and normal weight (85th P).

Parental weight and height were self-reported. The BMI was calculated. Overweight was defined as having BMI 25-29.9 kg/m<sup>2</sup>, obesity  $\geq$  30 kg/m<sup>2</sup>. The parents' education level was classified to Secondary (S), High Non-University (HnU) and High University (HU) education.

Statistical analyzes were performed by SPSS 20.0 version. An initial descriptive analysis was performed by calculating parental and children's BMI. For the further analyzes children's BMI was converted into percentiles (P), then crossing with the parental BMI and education level. The  $\chi^2$  test used to assess the degree of significance. Odds ratio (OR) was calculated to evaluate associations between children's BMI, parental BMI and parental education level.

## Results

206 children included in the study, 55.2%(n = 116) girls and 44.8%(n = 94) boys. 3.9% were underweight, 81.6%-normal weight, 11.2%-overweight and 3.4%-obese. Boys were 3 times more obese than girls (5.4% vs.1.8% respectively,  $p > 0.05$ ). They were almost equally overweight (11.7% vs.10.6% respectively,  $p > 0.05$ ). All groups didn't differ significantly.

At least one of parents was overweight or obese in 68.6% of cases, 31.4%-either normal or underweight ( $p < 0.001$ ). Normal weight or underweight parents had 12.1% obese or overweight, 82.8% normal and 5.2% underweight children. In families, where at least one of parent were overweight or obese results were respectively: 17.7%, 79%, 3.2% ( $p > 0.05$ ).

Obese and overweight parents were 1.57 times more likely to have an obese or overweight child ( $p < 0.05$ , OR = 1.57). There was a significant relationship between education (E) level of parents and children's BMI ( $p < 0.05$ ). 13.1% of mothers had S, 15%-HnU and 71.8%-HU E. 21% of fathers had S, 18%-HnU and 61%-HU E.

Mothers with HU E had more normal weight children than with HnU or S E (89.2% vs.77.4%, 76.9% respectively,  $p < 0.05$ ). The lower the mother's and father's E was, the higher part of overweight and obese children were noticed (Mother's: S-23.1%, HnU-22.6%, HU-10.8%; father's:S-26.8%, HnU-16.7%, HU-9.8%  $p < 0.05$ ). Mothers with lower than HU E were 2.63 times more likely to have obese or overweight children( $p < 0.05$ , OR = 2.63).

Fathers with S E were 2.87 times more likely to have obese or overweight children, than with HnU or HU E ( $p < 0.05$ , OR = 2.87). Meanwhile, fathers with HnU E were less likely to have obese or overweight children comparing to fathers with S E ( $p > 0.05$ , OR = 1,23). Fathers with HU E were 2.55 times more likely to have normal weight children comparing to fathers with S and HnU E( $p < 0.05$ , OR = 2.55).

## Conclusions

1. Boys and girls were equally underweight, overweight and had normal weight, although boys were 3 times more obese than girls.
2. Obese or overweight parents were more likely to have obese or overweight children, comparing to normal or

underweight parents.

3. Lower parental education level enhanced the risk of childhood overweight and obesity.

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## THE CLINICAL PECULIARITIES AND CAUSES OF MENINGISMUS IN CHILDREN

*Vestina Vilcinienė, Gabija Deksnytė*

*Supervisor of the abstract: Eglė Tamulevičienė*

*Department of Pediatrics, LSMU, Lithuania*

### Introduction

Meningismus is a condition in which the patient shows signs of meningitis (characterized by neck stiffness, headache, and other symptoms suggestive of meningeal irritation), but cerebrospinal fluid is normal [1].

The condition is associated with systemic viral or bacterial infections and a wide range of neurological pathology [2].

### Aim

To evaluate the clinical peculiarities and causes of children meningismus due to infectious diseases.

### Objectives

1. To assess the frequency of meningismus in children.
2. To evaluate epidemiological, demographic, clinical and laboratory features of meningismus.
3. To analyze the reasons of the meningismus.

### Methods

Retrospective analysis of cases of meningismus in children, treated in Kaunas Clinical hospital in 2013 – 2014 year. Cases were selected by TLK-10 classification (R 29.1). The diagnosis was confirmed by clinical symptoms and results of lumbar puncture (WBC  $\leq 5 \times 10^9/l$  in cerebrospinal fluid). Data about patient's gender and age, course of the disease and clinical symptoms (fever, nausea/vomiting, headache, meningeal symptoms) and laboratory (blood test, CRP) tests, length of the hospitalization were analyzed. Statistical analysis of data was performed using SPSS 22.0 statistical package. Frequencies, means and standard deviations were calculated.

### Results

A total of 42 children with meningismus were hospitalized in analyzed period. That made 0,45% of all children (n = 9344) treated in Kaunas Clinical hospital during 2013-2014 year. The highest rate of meningismus was observed from July to October – 64,29% of cases. Patients were from 2 to 17 years old (mean age  $9,31 \pm 4.4$  years). In 61,9% of cases children age ranged from 4 to 10 years old. More than half of the patients were boys 54,76%. Children were hospitalized from first to eighth day of the disease, in average on  $2.19 \pm 1.94$  day, most of children (n = 20) - on the first day of the disease. 97,62% of patients complained of headache, nausea or vomiting. 85,7% of patients had fever. The highest temperature at home or in the hospital was 40°C. In average fever lasted for a  $1.48 \pm 1,35$  day at home (mean of highest temperature  $38.45 \pm 0,87^\circ\text{C}$ ) and for  $2 \pm 1,23$  days in the hospital (the mean of highest temperature -  $38,41 \pm 0,89^\circ\text{C}$ ). 95,2% of patients (n = 40) were hospitalized with the symptoms of dehydration. The most common

meningeal symptom was Tripod sign seen in 80,95% (n = 34) of cases, followed by nuchal rigidity - 61.9% (n = 26), Kernig's sign - 26.19%, Brudzinski's sign - 23,81%. Focal neurological signs were diagnosed in 11.9% of cases. 64% of patients were examined by ophthalmologist (n = 15) and venous stasis was diagnosed to 20% of them (n = 3). Lumbar puncture was done in average on the  $2.78 \pm 2,28$  day of the disease. CRP ranged from 0,1 to 39,8 mg/l (mean  $8,61 \pm 10,13$  mg/l). WBC ranged from  $4.9 \times 10^9/l$  to  $17.2 \times 10^9/l$  rate (mean  $9,04 \pm 3,34 \times 10^9/l$ ) The most often causes of meningismus were upper respiratory tract infections: pharyngotonsillitis (viral - 38,1%, bacterial - 4,8%), otitis - 4,76%. 14,29% of patients had enteroviral infection and in 35,71% of cases the reasons were unknown. 4 patients were treated with antibiotics, other – symptomatically. 42,86% of patients were examined by otolaryngologist (n = 18). The mean duration of hospitalization was  $5.07 \pm 2,37$  days. All patients recovered.

### Conclusions

1. Meningismus was rarely diagnosed condition.
2. More than half of children age ranged from 4 to 10 years and the patients were boys. The highest rate of meningismus was observed from July to October. The cases were with typical clinic, without any complications. Blood tests were typical for viral infection.
3. In nearly half of cases the reason of children meningismus were upper respiratory tract infections, in one third of cases – the reasons were unknown.

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## THE MOST COMMON CAUSES OF PERINATAL HYPOXIA-INDUCED DEATH CASES IN RIGA FROM 2011 TO 2014

*Anna Abramova, Lelde Olte*

*Supervisor of the abstract: Ludmila Sokolova*

*Rīga Stradiņš university, Latvia*

### Introduction

Perinatal death rates in Latvia have improved from 19.2‰ in 1992 to 7.3 ‰ in 2014, but still are one of the highest in European countries. Perinatal death is death of foetus and new born during perinatal period. Perinatal death includes dying of foetus before birth (from 154th day of pregnancy) and during birth (stillborn), and new born dying during the first week of life (early neonatal death). [1] One of the most common causes of perinatal death is a lack of the oxygen supply to the foetus tissues, resulting in development of the hypoperfusion and biochemical changes in cells. Hypoxia becomes more important during the second and third trimester of pregnancy when fetal growth occurs.[2] Premature birth is one that occurs before the start of the full 37th week of pregnancy. [3] Mortality rate in neonatal age who has a severe hypoxic-ischemic encephalopathy is from 25% to 50%. Most deaths cases occurs in the first week of life due to multiple organ failure or inadequate therapy. [4; 5] Antenatal asphyxia is a most common reason of the perinatal death.

### Aim

The aim of the study is to analyse perinatal death and autopsy protocols of “Riga Maternity Hospital” Ltd. and “Pauls Stradins Clinical University Hospital” Ltd. as well as to clarify the most common causes and types of hypoxic damage.

### Objectives

- To analyse the most common causes of perinatal death;

- Find and analyse antenatal asphyxia, intranatal asphyxia and hypoxic ischemic multi-organ damage case;
- Death and the autopsy protocol analysis;
- To evaluate a maternal health problems can affect fetal hypoxia development;
- To evaluate a fetal health problems and developmental abnormalities associated with asphyxia;
- The comparability of data with foreign literature.

## Methods

During the study data from foetal death and autopsy protocols since January 1, 2011 to December 31, 2014 of "Riga Maternity Hospital" Ltd. and "Pauls Stradins Clinical University Hospital" Ltd. were retrospectively analysed in Children's pathology office of "Children clinical university hospital". The study classified as a retrograde analytical study. Data were statistically processed with MS Excel program.

## Results

Compiled 223 foetal death and autopsy protocols. Of these, 160 cases are antenatal asphyxia, 44 cases are intranatal asphyxia and 19 cases are injuries of hypoxic ischemic multi-organs. Male corpses are 55 per cent. In 117 cases of placental abnormalities placental detachment was registered in 39 cases; in 23 cases it was complete. In 17 per cent of antenatal asphyxia cases was registered twinning of umbilical cord around the neck, only in three cases umbilical cord had two blood vessels. Infection-caused damage of amniotic membrane, placenta and umbilical cord, which contributed to the hypoxic foetal tissue damage was registered in 78 or 35 per cent. The most common disease, registered in cases of antenatal deaths, is an mother's infectious disease, followed by preeclampsia and arterial hypertension. In 51 cases in the child brain were find an intracerebral haemathoma. The premature rupture of membrane (PROM) can a cause cut off important oxygen and blood flow to the fetus, in the report PROM was only in 18 cases or in 8 per cent. In forty per cent of the cases, mothers had a history of miscarriage, but in sixty-nine cases or 31 per cent of cases mother had the first pregnancy. Only in 4 cases child was from IVF procedures, but hromosomal pathology was detect in 5 cases. In 223 analysed protocols, age of the mother was shown only 98 cases. According to the available data on maternal age, average maternal age is 30 years.

## Conclusions

The most frequent causes of hypoxic fetal brain, kidney and other tissue damage contributing to death are consequences of mother's infectious disease, anaemia and arterial hypertension, as well as pathology of placenta, umbilical cord and amniotic membrane. Hypoxic condition can cause damage of all fetal cells.

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# THE OPPORTUNITY OF PERSISTENT VIRAL INFECTION IN CLINICAL AND IMMUNOLOGICAL MANIFESTATION OF COMMUNITY-ACQUIRED PNEUMONIA

*Corina Scerbatiuc, Nicolae Mihailisin, Stefan Maximciuc*

*Supervisor of the abstract: Ala Donos*

*USMF "Nicolae Testemitanu", Moldova*

## **Introduction**

Pneumonia is the cause of death of more than 2 mln children every year (~ 20% from all deaths). In RM the prevalence is 140-150 at 1000 of children. According to WHO, the mortality caused by herpetic infection is placed on 2nd place (15.8%) in group of viral infections. Death rate in CMV infection is evaluated at 30%, and 80%-100% of the survivors will develop such sequelae as: progressive deafness, mental retardation, microcephaly. Affectation of respiratory system at children with CMV Infection is estimated at 49%, clinical manifested by distress syndrome and pneumonia.

## **Aim**

To highlight the risk factors and determine the clinical and immunological particularities of CAP associated with persistent viral infection.

## **Objectives**

Purpose: 1. Evaluation of risk factors in developing of community-acquired pneumonia (CAP) at infants with comorbidities. 2. Determination of clinical and immunological markers in suspicion of recurrent viral infection. 3. Clinical and immunological particularities of CAP associated with acute phase of recurrent viral infection. 4. Diagnostic aspects of CAP at a little child with recurrent viral infection.

## **Methods**

1. Examination of medical cards. 2. Paraclinical Examination (HLG, biochemical examination, immunological examination using the Mancini's method-IgA, G, M; anti-CMV serological examination, Anti-CMV-IgA); 3. Screening Methods: chest X-ray, Echo of internal organs; 4. Consultation of Infectionist, gastroenterologist, psychoneurologist, allergist etc. 5. The obtained results were statistically processed by using varitional and descriptive analysis, with application of MS Excel statistic programs. In each group we had the follow age structure: from 1-6 months, 6-12 months, 1-3 years, 3-5 years. The distribution in study groups was the similar as in the control one.

## **Results**

From 106 children with CAP: I lot: Anti-CMV IgM+, Anti-CMV Ig G-31; II lot: Anti-CMV IgM neg; Anti-CMV Ig+-44; III lot: Anti-CMV IgM neg; Anti-CMV Ig = G neg-31. 1. Risk factors that determines the severe evolution of CAP at infants with positive herpetic IgM or IgG are herpetic family history 61,3%, in special with MV 43,07%. 2. Clinical diagnostic markers in suspicion of persistent viral infection-family persistent viral history, congenital pneumonia, prolonged neonatal jaundice, toxic hepatitis. 3. The association of CAP with IgM positive herpetic infection appreciate the severity of disease ( $35,48 \pm 1,4\%$ , ( $p < 0,05$ )), its duration (more than 1 month, 2 week of hospitalization) and the presence of complications ( $83,8 \pm 2,35\%$  ( $p < 0,005$ )) and comorbidities at this children.

## **Conclusions**

The herpetic infection is an important risk factor, that needs to be evaluated and studied. Persistent herpetic viral infection can be qualified as a medico-social problem, because of it's clinical and immunological manifestation, ditribution, amplitude and comorbidities.

## **References**

List of references was not included.

## TWINS, BORN AFTER IVF, ADAPTATION PECULARITIES

Austė Kabašinskienė, Vaida Vaitkeliūnaitė  
Supervisor of the abstract: Rita Kregždienė  
Department of Neonatology, LSMU, Lithuania

### Introduction

„IVF baby“ – this is how people call children, born after fertilization in vitro. There are over one million of the mentioned babies in the world currently, so this question causes very controversial discussions between doctors, politicians, priests and other representatives of the society. It is a frequent situation that infertile couples deny additional fertilization methods due to both: moral values and fear that it influences baby's health negatively. There is a group of academic researches, revealing that babies after the IVF are the same as naturally born ones in terms of physical state, cognitive and psychical-social functions, etc. We have decided to conduct a research the peculiar features of adaptation of the IVF babies during an active baby period.

### Aim

To assess adaptation peculiarities of the twins, born after IVF, comparing with natural fertilization.

### Objectives

1. To assess peculiarities of mothers' health, pregnancy and delivery development.
2. To assess babies' state during the first examination.
3. To assess babies' state during early newborn state.

### Methods

It is a retrospective research, conducted with the medical data of the twins, born at the Obstetrics and Gynecology Department of the LSMU KK in 2010-2013. The respondents were 58 babies, born after IVF procedure. The control group involved 112 random babies. The randomization was made by selecting every third twin baby couple from a registry book. In this research were analysed 29 mothers of twins medical cases, who got pregnant after IVF, and 56 mothers of control group twins. When analyzing their mothers' medical history the following was assessed: anamnesis data, pregnancy and delivery development.

The research assessed baby sex, gestation age, weight, Apgar scale, early newborn state in stationary conditions. The received data was processed via statistics program Microsoft Excel 2010. Data is statistically essential when  $p < 0,05$ .

### Results

The group of mothers after the IVF had no harmful habits, when 7(8,2%) of control group mothers used to smoke during pregnancy. An unfavorable obstetrics diagnosis was noticed for 13(44,8%) of mothers after IVF and 19(33,9%) of mothers from a control group ( $p = 0,32$ ). 34(40,0%) delivered naturally, 51(60,0%) – after Cesarean section ( $p > 0,05$ ). All twins, born after IVF, were dichorionic-diamniotic.

Total numbers: 95(55,9%) boys and 75(44,1%) girls. Total number of preterm babies was 90(52,9%). Statistically significant less preterm babies were in IVF group. The twin group after IVF showed 17(29,3%) babies with underweight (<2500g), control group - 54(48,2%). More babies with underweight (<2500g) were in the control group ( $P = 0,017$ ), including 22(40,74%) with a normal gestation. 5(2,9%) babies were born with hypoxia (Apgar1<6), 4(8,0%) of them were preterm and underweight.

In the early newborn stage there was 91(53,53%) healthy babies. Adaptation disorders had 27(34,2%) babies from IVF group and 52(65,8%) from control group. The reasons of the adaptation disorders was as follows: hypotrophy 8(4,7%), congenital defect 8(4,7%), anemia 11(6,5%), hyperbilirubinemia 25(14,7%), hypoglycaemia 5(2,9%), intraventricular hematoma – 8(4,7%), insufficient nutrition 15(8,8%), infection 6(1,3,5%), breathing dysfunction 15(8,8%), polycythemia 2(1,18%), other reasons 10(5,88%). Newborn babies from the control group showed breathing dysfunctions more frequently ( $p < 0,01$ ).

### **Conclusions**

1. Mothers after the IVF considered their pregnancy more responsibly; they had no harmful habits and delivered via Cesarean section in general. 2. The IVG group showed a lower number of preterm and underweight babies. 3. There was no statistically significant difference in adaptation peculiarities for the twins after the IVF and from the control group (natural fertilization).

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## POSTERS SESSION

# 100 PREGNANT WOMEN KNOWLEDGE OF INFLUENCE OF DIFFERENT INFECTIONS ON PREGNANCY PROCESS AND POSSIBLE COMPLICATIONS PROPHYLAXIS

*Anna Abramova, Lelde Olte*

*Supervisor of the abstract: Dace Rezeberga*

*Rīga Stradiņš university, Latvia*

## **Introduction**

There are many infection diseases and their influence on the fetus is quite significant. During the pregnancy immune system is weaker and it increases the risk of contracting infection diseases. Infections can unfavourably influence pregnancy process and even terminate it. Infections can be bacterial, viral and fungal. Vertical transmission is a term that refers to the spread of infections from mother-to-baby. These infections may occur while the fetus is still in utero, during the labor and after delivery. [1] The microorganisms most commonly associated with early-onset infection include the following Group B Streptococcus, Escherichia coli. [2] Latvian in accordance with the list of reimbursable medicines of 50% compensates influenza vaccination for pregnant women, but most of them doesn't know it. [3] Consequences of influence of infections on foetus can be curable, incurable and even lethal.

## **Aim**

The aim of the research is to assess knowledge of pregnant women about the influence of infectious diseases on pregnancy period and outcome as well as preventive measures for possible complications, to compare the knowledge of the results of other studies.

## **Objectives**

- 1) Questionnaires compilation
- 2) Take a survey of 100 pregnant women
- 3) To analyze the data obtained from questionnaires
- 4) To compare the data with data from similar studies
- 5) Give pregnant women the answers to their questions about infectious diseases during pregnancy 6) Results-based recommendations for the provision of care professionals.

## **Methods**

During the research the author compiled questionnaire which includes 34 questions. Inquiry was performed in "Rīgas Dzemdību nams" and "Rīgas Austrumu klīniskā universitātes slimnīca". The study classified as a cross-sectional study among pregnant women. As a result author choose 100 fully written questionnaires from all 150 questionnaires; they are being analyzed in particular paper. Respondents answered questions about the performance of immune system during the pregnancy, ways of infections of fetus, influence of infection diseases on the fetus and newborn as well as possible prophylaxis. Data were processed using MS Office Excel 2007 program.

## **Results**

Women are from 19 till 43 years old. The results of the research shows that 65% of women know that risk of getting sick with infectious disease is higher during the pregnancy, yet 17% believe protection of the immune system becomes stronger. The most common belief amongst women is that the fetus can be infected during the labor. More than 60% of women state that cytomegalovirus and bacterial vaginosis can harm foetus and negatively influence the pregnancy. During the pregnancy 30 women suffered from infectious diseases, the most frequent way was acute respiratory virus disease. 52% of women know that mother which is HIV positive need to avoid breastfeeding. Women with higher education, as well as the women during first pregnancy have a greater knowledge of the prohibition of breastfeeding HIV positive mothers. Pregnant women knew about the effects of infectious diseases on the fetus; the most common occurrence was intrauterine retardation. The most popular prophylactic measure amongst pregnant women is eating fresh fruits. Only one woman have vaccinated against flu being pregnant, but before pregnancy 29 women were

vaccinated against flu. The internet is the main source of information for 79 women. 57% of pregnant women admit that care specialist has not provided them with enough information during the pregnancy. At the end of the questionnaire pregnant women were given an opportunity to evaluate their knowledge; almost half of them believe having satisfactory knowledge.

### Conclusions

Pregnant women knowledge about the influence of infectious diseases on pregnancy period is incomplete. Women knowledge about the possibilities of vaccination during pregnancy is incomplete, because more than one-fifth of respondents negatively assessed influenza vaccination during pregnancy. Women during pregnancy generally chooses non-pharmacological prevention options.

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## ACUTE DIVERTICULITIS: DEMOGRAPHIC, CLINICAL AND LABORATORY FEATURES ASSOCIATED WITH COMPUTED TOMOGRAPHY FINDINGS

*Krista Nitina, Darta Ose*

*Supervisor of the abstract: Peteris Prieditis*

*Riga Stradins University, Latvia*

### Introduction

Acute diverticulitis is the most common cause of acute left lower-quadrant pain in adults. It is a common reason for acute hospitalization, as it affects over half of the population over 65 years with a prevalence that increases with age. 15% of patients may have complications such as abscesses, fistulas, obstruction, and perforation at presentation. To develop a correct diagnosis and guide the treatment imaging is used.[1] Computed tomography (CT) have sensibility and specificity and it is useful in diagnosis and staging of diverticulitis [2]. Until now there are no studies about radiologic, demographic, clinical and also laboratory findings in patients with acute diverticulitis in Latvia.

### Aim

To investigate demographic and clinical features of the patients and assess the association of these variables with computed tomography results that range from moderate to those of severe acute diverticulitis.

### Objectives

1. To estimate CT examinations of patients with diverticulitis in their radiologic imaging conclusion and divide them in to groups of severity.
2. To assess patient demographic profile in concerns of severity.
3. To determine if there is statistically significant difference between moderate and severe stages if assessing clinical and laboratory features.
4. To find out if there is necessary to make radiological investigation in order to proper diagnosis.

## Methods

from Institute of Diagnostic Radiology of Pauls Stradins Clinical University Hospital in Riga, Latvia from years 2013 and 2014. Those cases where information about patient profile and clinical features in their medical records or abdominal CT investigation were insufficient were excluded. For further study 71 radiological examination and medical record were valid, which were retrospectively examined according to a protocol designed by the author. Radiological examinations were estimated by author. During this study 71 CT imaging were divided into two groups according to radiological features. The first group of 28 examinations were with moderate findings (only pericolic inflammation), and second group of 43 examinations were with severe findings (extraluminal gas, free liquid and / or abscess). Data were statistically analyzed using MS Excel and SPSS 20.0. Data were presented as numbers of intervention, percentage, or means,  $p < 0.05$  was considered significant.

## Results

From 71 cases 67,6% were women, 32,4% men. With mean age  $64,6 \pm 15,12$ . From all diverticulitis cases 9,9% patients were in group under 40 years, 23,9% were in group 41-60 years, 49,3% - in group 61-80 years and 16,9% - in group patients older than 80 years. Patients with severe versus moderate findings had fewer patients in groups 41-60 years (20,9% vs. 28,6%,  $p > 0.05$ ) and older than 80 years (16,3% vs. 17,9%), and more patients in groups under 40 years (11,6% vs. 7,1%,  $p > 0.05$ ), and 61-80 years (51,2% vs. 46,4%,  $p > 0.05$ ) Patients with severe versus moderate findings had fewer females (60,4% vs. 67,9%,  $p > 0.05$ ), less lower abdominal pain only (74,4% vs. 82,1%,  $p > 0.05$ ), less constipation (11,6% vs. 25,0%,  $p > 0.05$ ), and more vomiting (7,0% vs. 3,6%,  $p > 0.05$ ), diarrhea (11,6% vs. 7,1%,  $p > 0.05$ ), fever (37,2% vs. 28,6%,  $p > 0.05$ ), leukocytosis (81,4% vs. 53,6%,  $p < 0.05$ ), c-reactive protein (93,0% vs. 82,1%,  $p > 0.05$ ) and the triad of abdominal pain, fever and leukocytosis (30,2% vs. 17,9%,  $p > 0.05$ ) respectively. Two of five patients with severe findings occurred without fever or leukocytosis.

## Conclusions

1. Diverticulitis is more common in women. Mostly diverticulitis is found in groups after 60 years.
2. There were not statistically significant difference between moderate and severe stages if assessing female gender, patient groups of ages, clinical features like constipation, vomiting, diarrhea and lower abdominal pain. There were also not statistically significant difference between both stages if assessing increased body temperature and c-reactive protein. Only statistically significant difference between stages was found in leukocyte level. Less than 50% of severe cases have the clinical-laboratory triad of abdominal pain, fever and leukocytosis.
3. That shows that only clinical investigations is not enough to assess the severity of patient. Further study is needed for additional investigations in order to proper diagnosis.

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# ANTENATAL AND EARLY POSTNATAL CARE OF RHESUS NEGATIVE PREGNANT WOMEN IN LATVIA IN YEAR 2012

*Ramona Galsone, Vitalijs Korsakovs, Evija Strankale*

*Supervisor of the abstract: Zane Krastiņa*

*University of Latvia, Latvia*

## **Introduction**

About 15% of the European population is rhesus negative. Rh sensitization generally occurs after foetomaternal haemorrhage and in 90% of all cases sensitisation occurs during childbirth [1,4]. Predispositions during pregnancy include amniocentesis, abortus imminens, placenta praevia, etc. [2]. Rhesus sensitization during pregnancy is one of the causes of haemolytic diseases of the newborn and in severe cases may develop hydrops fetalis and result in stillbirth [2,3]. All Rh negative pregnant women should undergo antibody screening at I and II trimester [4]. Postnatal care reduced sensitisation risk from 13% to 1-2%, while antenatal care reduced the risk 0.2 – 0.3% [5]. Anti D IgG administration early after delivery is a state supported program in Latvia from year 2006, but administration at 28 antenatal week became a state supported program only in year 2013 [6]. Based on information from Disease Prevention and Control Center, accurate epidemiological data on rhesus negative pregnant women incidence in Latvia are not known [7].

## **Aim**

The aim of this study is to determine the incidence of rhesus negative pregnant women, number of rhesus positive children born to an Rh-negative mother in Latvia as well as to evaluate conditions of anti-D antibody screening and immunization of antenatal and early postnatal care.

## **Objectives**

The objectives of this study evaluate the conditions of antenatal and early postnatal rhesus negative pregnant women in Latvia. To achieve the aim we explored the scientific publications on the rhesus negative pregnancy care and developed of parameters to be investigated. After we selected rhesus negative pregnant women from capital and regional hospitals maternity wards archives in Latvia in year 2012. There after processing and statistical evaluation of the results.

## **Methods**

We conducted a retrospective research study and reviewed 14682 clinical records in year 2012. All records were collected from archives of 5 Latvian region in 9 hospitals. 2052 Rh negative pregnant women were selected and included in the study group. From clinical records we analyzed the information about: newborn and fathers rhesus factor, anti D antibody screening and their positive or negative measurement in I and II trimester, time when pregnant women started prenatal check – ups (after or before 12th pregnancy week what can affect the possibility of taken antibodies at I trimester), anti D immunoglobulin administration week during pregnancy in postnatal period and after amniocentesis, frequent risk factors for sensitization (amniocentesis, low placenta, threat of miscarriage). All regions were compared. Exclusion criteria were Rh negative pregnant women with antenatal care received outside Latvia - 6. Data collection and statistical analysis was performed within SPSS 22.0 and Excel 2010 environment. P value <0.05 was considered to be statistically significant.

## **Results**

The incidence of Rh negative pregnant women in 2012 is 13.98% (n = 2052). Number of Rh positive births in Rh negative pregnant women group is 60.62% (n = 1244). Sensitized pregnant women are 2.14% (n = 44). 53.1% (n = 943) of pregnant women had detected antibodies at I trimester, smallest detection observed in Pierīga region 29.9% (n = 55) p < 0.01. 11.6% (n = 206) of pregnant women were not marked antibodies detection date. 32.6% (n = 654) of pregnant women antibodies were identified during the II trimester, smallest in Vidzeme region 19.3% (n = 42) p <

0.001 and Pieriga region 20.1% (n = 39)  $p < 0.001$ . 9.99% (n = 205) pregnant women started prenatal check – ups after 12. pregnancy week. 91.3% (n = 1096) Rh – negative women in Latvia received anti-D IgG after delivery. Smallest administration incidence observed in Vidzeme region 82.5% (n = 113)  $p < 0.00001$  and Kurzeme region 83.7% (n = 118)  $p < 0.00001$ , compared by months in June 80% (n = 96)  $p < 0.05$ . 1.1% (n = 22) - pregnant women received anti-D Ig at 28 - 30 weeks, administration observed only in Riga region 1.7% (n = 20) and in Pieriga region 1% (n = 2)  $p < 0.01$ , in other regions 0%. In 32.6% (n = 14) anti-D IgG was administered at the time of amniocentesis. For 11.34% of the pregnant most frequent risk factors (amniocentesis, low placenta, threat of miscarriage) for sensitization were observed.

### Conclusions

Rh negative pregnant women are not rare occurrence in Latvian population 13.98%. Percent of sensitized pregnant women is high 2.14% compared to other studies - 0.3 – 0.8%. Determination of antibodies at I and II trimester is not sufficient, because it is not determined in about half of the pregnant women. Especially low IgG administration frequency at the beginning of the third trimester was observed – 1.1%, but comparatively good administration frequency after the birth – 91.3%. But we have to take into account state policy changes - just at the year studied (2012) IgG injection at 28th week became a state supported program.

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## ANTIBACTERIAL THERAPY FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A SYSTEMATIC REVIEW

*Madara Broniča, Jānis Margevičus*  
 Supervisor of the abstract: *Jūlija Voicēhovska*  
 Riga Stradins University, Latvia

### Introduction

It is estimated that more than 200 million people worldwide and 44 million in Europe suffer from Chronic Obstructive Pulmonary Disease, about 65 million endure moderate to severe COPD. COPD is fourth leading cause of death worldwide and the number is increasing. It is a burden of World's health care. Severe stage of disease and exacerbation, which affect patient's quality of life and increases mortality. Risk factors of exacerbation 50 - 80% are bacterial infection. The GOLD guidelines do not recommend routine antibacterial therapy, and it is indicated when there is a conclusive finding of bacterial infection.

### Aim

The aim of the study was to investigate the effect of antibacterial therapy usage for COPD.

### Objectives

- Search articles in PubMed Databases of antibacterial therapy for COPD from 2004 - until 2014;
- Evaluate articles according to quality by using CONSORT (Consolidated Standards of Reporting Trials) table;
- To carry out a systematic review;
- To do a meta-analysis from results of randomized controlled trials.

## Methods

The systematic review was performed by searching the articles published in PubMed Databases from 2004 until 2014 using key words "antibacterial therapy copd", "antibiotics copd", "antibiotics copd exacerbation" . After identifying relevant titles, full text of articles were read and eligible data retrieved on performed sheets. For forward statistical analysis were included 21 randomized controlled trials, but due to heterogeneous results, meta -analysis was done for 3 randomized placebo controlled trials. In the meta-analysis the exacerbation rate, time between exacerbations and relative risk for exacerbations of COPD in the antibacterial and placebo group was calculated by using **StatsDirect** statistical software **Version 2.8.0**.

## Results

In total 637 articles were retrieved, 34 were eligible. After evaluating by CONSORT table, only 5 articles had high quality. Four studies were randomized placebo controlled and one was comparison of antibiotic therapy. The results of high quality studies were heterogeneous, but the tendency showed effectiveness of antibiotic therapy for moderate to severe COPD. The meta-analysis was done for 3 randomized placebo controlled studies with 1013 patients (606 in antibiotic group and 607 in placebo group). The mean duration of antibacterial course was 183 (SD 180) days, 272 days for prophylactic long term treatment and 5 days for short term prophylaxis. It confirmed that the rate of exacerbation in antibacterial group was 59% **versus** placebo 69%. The period between exacerbation in antibiotic group was 147 (SD 83) days versus placebo 111 (SD 54) days. The relative risk to exacerbation in antibacterial group compared to placebo group was 0.86 (CI 95% 0.49, 1.48).

## Conclusions

1. There are only few studies of antibacterial therapy for COPD (34 studies were selected);
2. There is limited number of high quality studies (5 studies for COPD);
3. Antibacterial therapy in COPD shows effectiveness compared to placebo;
4. Antibacterial therapy could decrease the exacerbation risk for patients with moderate to severe COPD;
5. The antibacterial therapy shows good effect for COPD in most of high quality trials, but there is no clinical evidence for single antibacterial agent.

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# ASSESSMENT OF CARDIOVASCULAR RISK FACTOR MANAGEMENT IN LATVIA

Anna Labuce

Supervisor of the abstract: Vilnis Dzerve, Jelena Pahomova

Riga Stradins University, Latvia

## Introduction

Despite the fact that methods of diagnostics and treatment are advanced and well developed, Cardiovascular diseases (CVD) still remains the most frequent cause of death in Latvia, accounting for approximately 57% of all deaths every year, according to the calculations of the Center of Disease Prevention and Control of Latvia. Secondary prevention and successful risk factor control is a crucial part of CVD management, that allows to lower complication risks and mortality. This study was proceeded as a part of the cross sectional study „EUROASPIRE IV” by European Society of Cardiology.

## Aim

The aim of this study is to investigate the differences of cardiovascular risk factors in two separate groups of coronary heart disease (CHD) patients: a group (A) that had suffered from cardiovascular events after a 1.5 year follow up and a group (B) that had not. Also, to assess the quality of secondary prevention of CVD in Latvia.

## Objectives

From 2010 until 2012 270 patients were included in “EUROASPIRE IV” after receiving treatment of a cardiovascular event (CE). 1.03 ( $\pm 0.05204$ ) years after CE patients were invited to a visit for interview and examination. In January 2015 the patients were contacted via telephone, mail or e-mail for a follow up, and interviewed once again.

## Methods

Data from patients’ medical charts were collected and analyzed. 165 parameters were defined for the database for each patient. After the follow up in January 2015 all patients were divided into two groups: group A (the End-point group - patients who had died or suffered from a non-fatal acute myocardial infarction or stroke after the follow up) and group B (patients who had not had any CEs). The results were analyzed and processed by using descriptive statistics methods (SPSS statistics software and Microsoft Excel).

## Results

At the beginning of the study 270 patients were included. 61.5% of them were male ( $n = 166$ ), 38.5% – female ( $n = 104$ ). The median age was  $64.2 \pm 0.749$  and  $67.7 \pm 0.803$  years for men and women respectively. 76.5% of men and 87.5% of women had history of arterial hypertension (AH), 66.3% of men and 69.2% of women – dyslipidemia, 12.7% of men and 17.3% of women – known diabetes mellitus (DM), and the median Body mass index (BMI) was  $28.0 \pm 0.584$  kg/m<sup>2</sup> and  $29.8 \pm 0.625$  kg/m<sup>2</sup> for men and women respectively. 43.6% of men and 44.7% of women were overweight (BMI 25 – 29.9 kg/m<sup>2</sup>), and 39.4% of men and 40.8% of women were obese (BMI  $\geq 30$  kg/m<sup>2</sup>). 19.9% of men and 7.7% of women were smokers. 58.8% of men and 44.2% of women had high physical activity, but 20.5% of men and 33.7% of women had low physical activity.

As a result of the follow-up information was collected about 204 patients. 196 patients were contacted – 119 of them were male (60.7%) and 77 were female (39.3%). 8 patients had died during this time – 5 men and 3 women. In the group A (End-point) 28 patients were included (median age in this group was  $68.4 \pm 1.475$  years), but in the group B – 176 patients (median age –  $65.3 \pm 1.160$  years). 35.7% of group A and 29.7% of group B had AH, 21.1% of group A and 31.2% of group B had dyslipidemia, 17.9% of group A and 15.8% of group B had DM, 53.6% of group A and 43.6% of group B were overweight and 35.7% of group A and 42.3% of group B were obese. 11.1% of group A and 28.6% of group B were current smokers. 35.7% of group A and 52.3% of group B had high physical activity; 50.0% of group A and 26.1% of group B had low physical activity.

## Conclusions

In the group A (End-point) cardiovascular risk factors are more often observed than in the group B, which indicates that the frequency of them is directly associated with cardiovascular event and mortality risks. Only 13.7% of all patients were included in the group A, but the group B was much larger – 86.3% of all patients, which reveals that majority of the patients had their risk factors managed well enough. It suggests that cardiovascular risk factor management in Latvia is appropriate enough.

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## COMPARISON OF CLINICAL AND HEMODYNAMIC RESULTS BETWEEN TWO MOST FREQUENTLY USED TRANSCATHETER AORTIC VALVES AT PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL

*Janis Lacis, Inga Narbute, Milana Zabunova, Marina Berzina, Irina Cgojeva*

*Supervisor of the abstract: Martins Kalejs, Romans Lacis, Peteris Stradins, Ainars Rudzitis, Andrejs Erglis  
Riga Stradins University, Latvia*

## Introduction

Today at Pauls Stradins Clinical University Hospital more than 90% of cases of transcatheter aortic valve implantation (TAVI) procedures are done using bioprostheses made by two companies, which are Edwards Sapien (EW) and Medtronic Corevalve (MDT). Edwards Sapien valve is with cobalt-chrome stent and is balloon-expandable, Medtronic Corevalve is self-expandable nitinol stent valve.

## Aim

The goal of this study is to compare EW and MDT early clinical and hemodynamic results among all patients who have had undergone TAVI procedure at Pauls Stradins Clinical University Hospital, Centre of Cardiology.

## Objectives

Gather early hemodynamic and clinical data about patients who have had TAVI procedure at Pauls Stradins Clinical University Hospital. Perform data analysis and summarize the results.

## Methods

This is a retrospective study using TAVI patient registry from 2009 to 2015. Between patient groups prime demographic data, EUROScore I, procedures immediate and early results, pre- and postprocedure echocardiographic data were compared. All data were analyzed with the MS Excel 2007.

## Results

Since 2009 at Pauls Stradins Clinical University Hospital, Centre of Cardiology 168 TAVI procedures have been performed from which EW and MDT bioprostheses were used in 166 procedures (98.8%). EW valve was used in 118

patients and MDT valve - in 48 patients. The mean age in MDT group was 83.1 years which was notably higher than in the EW group - 81.4 years ( $p = 0.045$ ). Comparing EUROScore I, there was not a significant difference between the groups: 19.5% EW and 20.3% MDT ( $p = 0.37$ ). The implantation procedure was successful in 97.5% of cases in the EW group and 100% in the MDT group. 30-day mortality rate was 2.5% in the EW group and 4.2% in the MDT group. Between the subgroups performed via the transfemoral approach vascular complications occurred in 16.2% in the EW group and 8.8% in the MDT group. Permanent pacemaker implantation was necessary in 4.1% in the EW group and 16.3% in the MDT group. Maximum postprocedure transvalvular pressure gradient in the MDT group was 13.8 mmHg, which was notably lower than EW group: 21.3 mmHg ( $p = 0.0002$ ). The mean gradient in the MDT group was 7.3 mmHg and in the EW group 11.5 mmHg ( $p = 0.004$ ). Immediate paravalvular regurgitation (grade 2 or more) in the MDT group was in 44.7% and in 33.3% one month after the procedure, in the EW group it was 19.3% and 16.9%, respectively.

### Conclusions

1. The procedure success rates in both groups are decent: 97.5% (EW) and 100% (MDT). 30-day mortality is 2.5% in EW and 4.2% in MDT groups.
2. Permanent pacemaker implantation in the MDT group was needed 4 times more often than in the EW group, however in the EW group vascular complications occurred twice as often as in the MDT group.
3. Comparing hemodynamic results, MDT group had notably lower transvalvular pressure gradients, however paravalvular regurgitation (grade 2 or more) occurred more often than in the EW group.

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## CONGENITAL MEDIAL NECK CYSTS RECURRENCE AFTER SURGICAL TREATMENT

*Elīna Mežzīle*

*Supervisor of the abstract: Jānis Sokolovs*

*Rīga Stradiņš University, Latvia*

### Introduction

Medial neck cyst is one of the most common noninflammatory neck masses in children. Most often these are thyroglossal duct cysts followed by dermoid cysts, vascular malformations and other. This congenital malformations of

the head and neck area in most cases are diagnosed at the age up to 10 years. [1] Recurrence after surgical treatment is the most common complication - an average 7% of patients. [2]

### **Aim**

Analyze the frequency of congenital medial neck cysts of children in Children's Clinical University Hospital (CCUH) of Latvia during the period from 2003 till 2015 and evaluate cysts recurrence and its possible influencing factors such as age, sex, surgical technique, postoperative histological response and inflammatory process in cysts with incision and drainage in anamnesis.

### **Objectives**

Collect data on Children's Clinical University Hospital for patients with congenital neck cysts for twelve years period from 2003 till 2015 and assess patients with surgical treatment. Analyze cyst recurrence and its possible relation to patients age, sex, surgical technique that was made during surgery, postoperative histological response and inflammatory process in cysts with incision and drainage in anamnesis.

### **Methods**

A retrospective study using the CCUH information database and patients medical charts. According to ICD-10 diagnosis code Q.18.8. 325 patients were selected. The study included 135 patients with diagnose – *cysta colli media*. According to study criteria (surgery and postoperative histology response) 99 patients were included for further research. For data collection and statistical calculations *MS Excel 2010* and *SPSS* softwares were used.

### **Results**

Average age of 99 patients was 6.05 years, 43.4% girls (n = 43) and 56.6% boys (n = 56). From all treated patients, cyst extirpation surgery was made for 42.4%, but cyst extirpation and partial resection of the tongue bone was made for 57.6%. In postoperative histological material response, 59.6% patients had no inflammatory infiltrates and 40.4% were inflammatory infiltrates. Inflammatory process in anamnesis (hospitalization with incisions and/or drainage) was for 16.3% patients, while for 83.8% patients it wasn't. Recurrence occurred for 12.1% (n = 12) of all 99 cases. Next various factors that can affect the development recurrence were compared and evaluated. It was concluded that from all patients with recurrent cysts 33.3% was girls and 66.7% - boys (p = 0,451). If the surgery technique was cysts extirpation, then recurrence developed for 91.7% patients, but with extirpation and partial resection of the tongue bone only 8.3% (p = 0,006). Patients who had incision and drainage in history, 50.0% develop recurrent cyst, but patients who have no inflammatory process in anamnesis, 88,5% cases have no recurrence (p = 0,001). After postoperative histology response was showed, for 58.3% patients with histological approved inflammatory infiltrates have further recurrence (p = 0,177). Patients mean age who have recurrent cyst was 5.33 years. Children older than six years developed new cyst after surgery in 25% of cases, but children younger than six years - 75.0% (p = 0,51).

### **Conclusions**

1. Congenital medial neck cysts in CCUH during the period form 2003 till 2015 were diagnosed and treated mostly for children under the age of 10, matching the information available in literature.
2. Recurrence after surgical treatment developed for 12% of patients.
3. After cysts extirpation recurrence developed more often than extirpation with partial resection of the tongue bone (p = 0,006).
4. Inflammation in history such as incision and/or drainage statistically significantly influenced the development of recurrence. (p = 0,001)
5. There is no statistical significance found, that inflammatory infiltrate in postoperative histology response affect recurrence. (p = 0,177)
6. Children under the age of six in surgery time has trend to develop recurrence, but more research is necessary for statistical confidence. (p = 0,509)

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## CRP ACCURACY COMPARED TO THE PCT IDENTIFYING PATIENTS WITH INFECTION

*Karīna Švaičenko*

*Supervisor of the abstract: Ludmila Enģele*

*Riga Stradins University, department of medicine, Latvia*

### Introduction

Procalcitonin (PCT) is highly specific marker for the diagnosis of clinically relevant bacterial infections and sepsis. Procalcitonin supports early diagnosis and clinical decision making which could direct an effective therapy at the right time and avoid unnecessary spending for critically ill patients. Serum concentrations of PCT are normally <0.05 ng/mL but in circumstances of systemic inflammation, particularly bacterial infection, PCT is produced in large quantities by many body tissues. It is detectable within 2-4 hours and peaks within 6-24 hours. But C-reactive protein (CRP) is still an effective and specific indicator of infection. Therefore, in today's socio-economic condition the patient on suspicion of infection laboratory examination may begin with CRP, and only if this indicator will be significantly altered the examination can be continued with PCT. So it can avoid unnecessary and expensive examination.

### Aim

The main aim of study is to analyze the inflammatory parameters of patients from Riga East University Hospital „Gailezers” Laboratory Medical Center database, to prove that patients laboratory examination can start with CRP and only if it is above the upper limit of the reference interval to continue with the PCT. CRP is still very effective marker of infection and can be a safe first step in choice of diagnosis and treatment option. The second step would be PCT, which help to choose future tactics and therapy.

### Objectives

In the study are included 72 patients out of 168, who in the time span from 1 January 2015 to 31 January 2015 were hospitalized or transferred from other departments to toxicology and sepsis clinic. In one of the treatment period, patients were taken white blood cells (WBC), CRP, PCT and microbiological tests (blood plating on flora, urinary plating on microflora, sputum examination of flora lumbar puncture plating on flora, wound separation, cavity puncture, exudative, swab (also nose and throat), rinsing and other material plating on the aerobic and facultative anaerobic microflora, stool plating, plating on methicillin-resistant *S. aureus* (MRSA) wearing). It was viewed first two CRP and PCT scores and WBC on the following dates with an average of 1.3 days apart. It was retrospectively analyzed the data from hospital discharge summaries from the "Doctor's Office" program. It was assumed that the CRP reference range is 0 to 5 mg / L, PCT reference range 0 to 0.05 ng / ml and WBC reference interval 4.00 to 9.00 10<sup>9</sup> / L, from 0 to 3.99 10<sup>9</sup> / L - leucopenia, all measurements over 9.01 10<sup>9</sup> / L - leucocytosis.

### Methods

The study is retrospective, and has analyzed data from from Riga East University Hospital „Gailezers” Laboratory Medical Center database on the complete blood counts, serum clinical chemistry, microbiological tests and data from hospital discharge summaries. Statistically data were obtained with Excel and SPSS programs using descriptive statistics.

## Results

In the study were included 72 patients, 51.4% was female and 48.6% was male. Leucopenia was observed in 5.6%, normal number of WBC count - 20.8%, leucocytosis - 73.6% of cases. In second measurement leucopenia was in 5.6%, normal number of WCB - 22.2%, leucocytosis - 68.1% of cases, in 4.2% cases the analysis didn't take it again. The first PCT (PCT1) was above reference interval in 84.7%, the normal level - 15.3%. The first CRP (CRP1) was above the reference interval in 93.1% of cases, the normal level was in 6.9% of cases. Second PCT (PCT2) was above the reference interval in 83.3%, in 8.3% was normal and 8.3% didn't take it again. The second CRP (CRP2) was above the reference interval in 91.7%, 5.6% was normal and in 2.8% of cases the analysis wasn't repeat. In 34 cases CRP2 decreased compared with the first results and in 37 cases increased. Compared with the first measurement PCT2 increased in 35 cases and in 28 cases decreased. In 3 cases measurement remained unchanged. Looking at PCT1 and CRP1 results using the crosstabs were yielded the following data: in 98.4% (N = 60) of elevated CRP1 PCT1 was also elevated, and only in 1 case (1.6%) of normal CRP1 PCT1 was above the normal level (P < .001). In 69.4% of cases patients had a positive microbiological findings. In 43.1% during treatment was added to the surgical departments, 39.1% at the therapeutic units and 18.1% were treated in toxicology and sepsis clinic. More frequent diagnosis group were respiratory system diseases - 16.7%, digestive system diseases - 25% of the injuries and poisoning - 15.3%, and genitourinary diseases - 12.5%. In 77.8% of cases patients were discharged from the hospital, in 22.2% was Exitus letalis.

## Conclusions

These study showed that both CRP and PCT is quickly reacting to the presence of infection. Already the first CRP in 93.1% of cases were above the reference interval to PCT1, which were above the reference interval in 84.7% of cases. The group with normal CRP and PCT levels got small: 6.9% for CRP1 and 15.3% for PCT1 cases. In 36.4% of cases (N = 4) of normal CRP PCT1 were also in normal levels, and only in one case (1.6%) of normal CRP1, PCT1 was above the reference intrval (P < .001). It can be concluded that the new patients with suspected infection can start laboratory investigation with CRP, and only if this measurement is above the reference range further clarification of tactics would be desirable to find additional PCT levels. In today's socio-economic condition it is not favorable to take both CRP and PCT at the same time for patients with suspected infection.

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## DISTRIBUTION OF CHOLINERGIC AND ADRENERGIC NEURONS IN THE HEART OF A FROG

*Greta Graužinytė, Agnė Andriuškevičiūtė*

*Supervisor of the abstract: Gertrūda Skripkienė*

*Lithuanian University of Health Sciences, Medical Academy, Faculty of Medicine, Institute of Anatomy, Lithuania*

### Introduction

The intrinsic cardiac nervous system plays an important role in the regulation of heart activity (2). A frog is a convenient animal model for anatomical and physiological studies of the intracardiac neurons (1, 4). Compared to a mammalian heart the intracardiac neurons of the frog is more accessible for researchers (1). Although the

architecture of the intracardiac nerve plexus and the morphological characteristics of the cardiac ganglion nerve cells of the frog have been studied (1), little is known about the immunohistochemistry of cardiac neurons. Up to date, the distribution of the cholinergic and adrenergic neurons in the frog intracardiac nerve plexus has not been evaluated. This work was performed in order to assess the distributive features of neurons in the heart of a frog.

### **Aim**

The purpose of this study is to determine the distribution of cholinergic and adrenergic neurons in intact intracardiac nerve plexus of the frog using double immunohistochemical labeling.

### **Objectives**

1. To visualize cholinergic and adrenergic neurons in flattened intact preparation of the heart of the frog using double immunohistochemical labeling.
2. To determine the distribution of cholinergic and adrenergic neurons in the intracardiac nerve plexus of the heart.

### **Methods**

1. The study of nerve cells was performed on 8 adult frogs *Rana temporaria* of both sexes. The experiments were performed in accordance to LSMU guidelines for the use of experimental animals.
2. Examples of flattened hearts were prepared to dissect the atria including interatrial septum, venal sinus, anterior caval veins and atrioventricular region in single piece after the heart was chemically fixed.
3. Cardiac nerve structures were stained immunohistochemically for choline acetyltransferase (ChAT) and tyrosine hydroxylase (TH) in flattened frog heart preparations. ChAT and TH are used as markers of the cholinergic and adrenergic neurons, respectively (3).
4. Distribution of ChAT and TH stained somata of nerve cells was analysed in the following divisions of the heart nerve plexus: 1) anterior caval veins (n = 13); 2) sinuatrial region (n = 7); 3) interatrial septal nerves (n = 15); 4) interatrial septum excluding septal nerves (interatrial septum) (n = 8); 5) atrioventricular ganglia (n = 13); 6) inner surface of the ventricle (ventricle) (n = 7).
5. Flattened frog heart preparations stained immunohistochemically were observed and photographed using fluorescent microscope AxioImager Z1 equipped with Apotome at 100x, 200x and 400x magnifications.
6. The number of neurons was estimated in optical sections by counting exclusively the nerve cells that contained visible nuclei using image analyzing software AxioVision 4.7.2.
7. The results were analysed using MS Excel 2010 programme.

### **Results**

13 anterior caval veins (651 neurons), 7 sinuatrial regions (1733 neurons), 15 interatrial septal nerves (1953 neurons), 8 interatrial septa (1379), 13 atrioventricular ganglia (1459 neurons), 7 ventricles (629 neurons) were studied in 8 dissected frog hearts.

The cholinergic and adrenergic neurons in flattened preparation distributed 93,36% (ranging from 89,02% to 99,23%) and 6,64% (ranging from 0,77% to 10,98%) on average respectively.

96,04pc of adrenergic neurons were found in atrioventricular ganglia and 3,96% of adrenergic neurons were found in other five regions of the preparations.

The average distribution of cholinergic and adrenergic neurons in:

anterior caval veins was 99,23% (ranging from 98,00% to 100%) and 0,77% (ranging from 0,00% to 2,00%) respectively;

sinuatrial region was 99,95% (ranging from 99,64% to 100%) and 0,05% (ranging from 0,00% to 0,36%) respectively;

interatrial septal nerves was 99,78% (ranging from 98,85% to 100%) and 0,22% (ranging from 0,00% to 1,15%) respectively;

interatrial septum was 98,93% (ranging from 92,5% to 100%) and 1,07% (ranging from 0,00% to 7,50%) respectively;

atrioventricular ganglia was 72,96% (ranging from 54,08% to 94,92%) and 27,94% (ranging from 5,08% to 45,92%) respectively;

ventricle was 99,45% (ranging from 97,50% to 100%) and 0,55% (ranging from 0,00% to 2,50%) respectively.

## Conclusions

1. Cholinergic neurons which were positively stained for ChAT marker dominated in all regions of the preparations.
2. The significant majority of TH positively stained neurons clustered in atrioventricular ganglia while the remaining part of TH positively stained neurons were located in other regions of preparation.
3. Even though the highest distributive percentage of TH positively stained neurons was found in atrioventricular ganglia, the domination of ChAT positively stained neurons remained.

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## DO LITHUANIAN FOOD INDUSTRY WORKERS HAVE A HEALTHY SKIN AT WORK?

*Giedrė Tamulytė, Erika Liovaitė*

*Supervisor of the abstract: Matilda Bylaitė – Bučinskienė, Edita Naruševičiūtė – Skripkienė*

*Faculty of Medicine, Vilnius University, Lithuania*

### Introduction

Work-related skin diseases are a relevant concern, since they are the second most common cause of medical illness in the workplace. Food industry has been linked with a high risk for work-related skin problems. There is a lack of data about skin problems in food workers in Lithuania.

### Aim

To discover the incidence of skin problems among food industry workers in Lithuania, also to detect occupational risk factors for them, establish the level of workers knowledge about skin care at work.

### Objectives

To find occupational skin risk factors that food industry specialist confront on daily basis, to reveal whether workers know how to care of their skin at work, to establish which skin problems are dominant and to discover whether workers seek medical care for their dermatitis.

### Methods

A survey with anonymous questionnaire was performed in 12 food industry institutions. The main collected data were respondents' age, gender, education, work position and experience, dermatological problems that arose after start of work in this field, information about received dermatological help, possible skin risk factors related to this occupation and which skin protection measures were used at work. The statistical analysis was performed using SPSS software version 17.0.  $P < .05$  was considered significant.

### Results

The majority of all 353 respondents were women (78,5%), the mean age –  $30 \pm 10,96$  years, average duration of work experience – 6 years, 89,5% of them work in the restaurants. 57,8% had no training about skin care at work, 62,7% of them expressed an urge to acquire such knowledge. 65,7% wash their hands >10 times per day, though 61,2% do not know about negative wet work impact on their skin. Dermatological complaints were expressed by 24,1% individuals.

43 subjects had atopic conditions: 16– allergic rhinitis, 11– atopic dermatitis, 9– bronchial asthma, 7– allergic conjunctivitis. The hands were mostly affected (18,4%) and the most common complaints were skin dryness (19,5%), pruritus (7,9%) and redness (11,89%). Skin complaints usually appeared during the first 6 months after the start of employment (1st month – 21,2%, 2–6 months – 36,5%, 7–12 months – 30,6%, >1 year – 11,8%). The combination of classic symptoms of hand eczema (itching, redness, scaling of the skin) were noted by 5,6% of respondents. 61,2% of all had no training about skin protection at work, 85,8% noted that skin improves during weekends or vacations. Dermatological problems influenced the quality of work for 24,7% of the respondents, although only 43,5% specialists were seeking for dermatovenereologists' help. Skin protection with gloves and moisturizing creams was used by 32% workers.

### Conclusions

One forth of food industry workers had skin problems mainly in the arms and hands. More attention to skin care should be paid during the first year of employment, since it is the time when skin disorders usually start. Training for the food industry workers about risk factors and protection measures for skin is desirable, as they have a lack of this type of knowledge or their information is incorrect.

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## EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF MEASLES OUTBREAK IN LATVIA IN 2014: A RETROSPECTIVE DESCRIPTIVE STUDY OF PATIENTS WITH MEASLES IN RIGA EAST UNIVERSITY HOSPITAL STACIONARY “INFECTOLOGY CENTER OF LATVIA”

*Lauma Dobelniece, Laura Bubko*

*Supervisor of the abstract: Baiba Rozentāle*

*Riga Stradins university, Latvia*

### Introduction

Measles is an acute viral disease characterized by fever, cough, coryza, conjunctivitis, an erythematous maculopapular rash, and a pathognomic enanthema - Koplik spots. In the prevaccine era, measles was common disease all over the world. Nowadays, thanks to widespread use of measles vaccine, it has led to a greater than 99% reduction in measles cases. In the recent five years, many measles outbreaks in different countries have been reported. It is a relevant topic, because adults are more likely to suffer from measles complications, like encephalitis or pneumonia, with possible lethal outcome. During the past 10 years, Latvia reported only 16 cases of measles, but in 2014, an outbreak of measles virus occurred. In total, 35 cases of measles were laboratory confirmed. Fifteen cases were hospitalized in Riga East university hospital Stacionary “Infectology Center of Latvia”.

### Aim

Retrospective analyse all fifteen cases hospitalized in “Infectology Center in Latvia” and find the ratio of average illness duration, hospitalization length, vaccination status, course of the disease, possible epidemiological factors and diagnostic methods based on the information in medical histories.

### Objectives

- 1) Find peak incidence of morbidity with measles among all analysed cases;

- 2) Find the average illness duration and hospitalization length;
- 3) Analyse the course of the disease and find the incidence of complications;
- 4) Analyse the vaccination status among all fifteen cases;
- 5) Identify possible epidemiological factors;
- 6) Analyse diagnostic methods, that were used to identify measles virus.

## Methods

Retrospective analyse information in medical histories of patients with measles, who were hospitalized in Riga East university hospital Stationary "Infectology Center of Latvia" in 2014. The investigation was done during the time period of 26.01.-16.02.2015. Laboratory confirmation of measles infection – anti-Rubeola IgM and IgG confirmation with ELISA and measles RNA confirmation with multiplex PCR-RL. All calculated data in result section was obtained using MS Excel.

## Results

All cases of measles hospitalized in "Infectology Center of Latvia" in 2014 occurred during the time period from March till June. The peak of incidence was in April, when total number of reported cases was 11 (73%), other cases occurred in March – 2 (13%), May – 1 (7%), June – 1 (7%). Among all patients 9 (60%) were female, 6 (40%) - male. The mean age of all patients – 36,6 years (SD ± 13,5), youngest patient was 18, the oldest – 56. The average duration of illness – 9,1 days (SD ± 2,2), mean hospitalization length – 4,7 days (SD ± 2,1). In 2 (13,3%) cases were observed complications – in both cases pneumonia was diagnosed clinically and radiologically. Almost all cases – 13 (86,7%) had a typical course of the disease, respectively 2 (13,3%) cases were atypical. Three different diagnostic methods were used for diagnosis confirmation. Serologic testing for measles was used for all patients. Detection of measles virus RNA in urine and nasopharyngeal smear was done and was positive in all cases – 15 (100%). Isolation and identification of measles virus in cell culture was used and was positive for 6 (40%) patients. Both diagnostic methods were also used for 6 (40%) patients. The problem of lack of information about immunization status against measles occurs, only 3 (20%) patients were certain about their vaccination against measles. Respectively 12 (80%) patients were not aware about their vaccination status. Epidemiological anamnesis was known in 7 (46,7%) cases, from which nosocomial transmission occurred and affected 6 (40%) healthcare workers.

## Conclusions

On the basis of this research, the peak incidence of morbidity with measles was in April. The average duration of illness was 9,1 days, but mean hospitalization length – 4,7 days. Serological testing and measles virus RNA detection in urine and nasopharyngeal smear was done in all cases. Complications occurred in 2 (13,3%) cases and in both cases pneumonia was diagnosed. In 2 (13,3%) cases the course of the disease was atypical and therefore difficult to diagnose. According to data from medical histories, only 20% of all patients were aware of their vaccination status. Epidemiological data shows, that morbidity with measles among health care workers was significant – 40% of all patients. Therefore not only general public is invited to check their immunization status, but also health care workers should not forget that they are exposed at even higher risk of infection. This research helps illustrate how a highly vaccinated population is still susceptible to disease outbreaks, as a result of less-than-ideal vaccination coverage and inadequate immunity levels.

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## EPIDURAL ANAESTHESIA AND MALPOSITIONS OF FETAL HEAD AT DELIVERY IN PRIMIPARAS

*Santa Krievina, Jelena Dunaiceva*

*Supervisor of the abstract: Anna Miskova*

*Riga Stradins University, Faculty of Medicine, Latvia*

### Introduction

Epidural anaesthesia (EA) is widely used as labor analgesia. It has been reported that EA can slow down the course of labor and increase the risk for operative vaginal delivery (1). Some published data have also suggested an association between EA use and malpositions of fetal head (2). Malpositions are abnormal positions of the vertex of fetal head in relation to the pelvis of the mother and might contribute to lower rate of spontaneous vaginal delivery and to an increased risk for fetal distress, especially among primiparous women (3).

### Aim

To determine whether EA increases the rate of malpositions of fetal head at delivery and to assess the impact of malpositions on delivery if EA is used.

### Objectives

To determine rate and types of malpositions. To determine whether timing of EA has an impact on the rate of malpositions. To determine whether parturients with malposition have longer length of the labor if EA is used. To determine rates of acute fetal distress and impact of malpositions on its development. To evaluate stimulation of labor and to determine the rate of the operative vaginal delivery.

### Methods

A total of 477 medical records of primiparous women who had a vaginal delivery at a local maternity hospital in 2013 were retrospectively analyzed. Parturients were divided into two groups: EA group, which included 220 primiparous women and control group, which included 257 primiparous women who did not have EA. SPSS 22.0 was used for the statistical analysis. Shapiro-Wilk test was used to test for normality. T-test, Chi-square test, Mann-Whitney U test were used when appropriate. P value <0.05 was considered statistically significant.

### Results

Only occiput posterior malpositions were encountered, with low, but similar rates in both EA and control groups (2.3% (n = 5) vs. 2.3% (n = 6), p = 0,964). In majority (89.5%) EA was started in the active phase of the first stage of labor ( $\geq 4$ cm cervical dilation). Incidence of occiput posterior did not increase if EA was started in the latent phase of labor, compared to active phase (0.0% vs. 2.5%, p = 0,440). There were no statistically significant differences in length of the first and second stages of labor in EA group if occiput posterior was present or not. Also, the length of stages did not differ if EA was used or not in case of occiput posterior. Acute fetal distress rates were similar in both groups. However, primiparas with EA and occiput posterior were more likely to develop acute fetal distress in comparison to primiparas with EA and without occiput posterior position of fetal head (40% vs. 9.8%, p = 0.029; RR = 4.09, 95% CI 1.3-12.9). There was no statistically significant link between occiput posterior position and acute fetal distress in control group primiparas. Labor stimulation with oxytocin was seen in 87.3% women who received EA, compared to 20.2% in control group (p < 0.001). Operative vaginal delivery rate was low - 1.4% in EA group and 1.2% in control group, with no statistically significant differences (p = 0,848), and only vacuum extraction was used. Moreover, vacuum extraction was used in none of the occiput posterior cases.

## Conclusions

Epidural anaesthesia does not increase the risk for occiput posterior position of the fetal head. Development of occiput posterior at delivery is not influenced by length of labor or timing of epidural anaesthesia in respect to cervical dilation. Epidural anaesthesia does not increase the overall risk for acute fetal distress. However, the risk for acute fetal distress among primiparas who receive EA is increased in case of occiput posterior position of the fetal head.

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## EPIDURAL ANALGESIA AND OPERATIVE DELIVERY

*Marija Kolosova, Maija Koka, Ramona Galsone*

*Supervisor of the abstract: Ināra Miltiņa*

*Riga Stradins University, University of Latvia, Latvia*

### Introduction

Epidural analgesia (EA) is an injection of local anesthetic agent and an opioid analgesic agent into the epidural space, causing segmental sympathetic and sensory nerve block, as well as a decrease in the endogenous catecholamine level (1). Approximately 60% patients in the USA prefer EA during labor (2). In contrast its use is only 9.5-15% in Hong Kong (2). The mean incidence of EA in Riga in 2014 was 17.6% (3). EA reportedly decreases uterine activity, therefore prolonging labor (4, p317). This may result in the higher rates of instrumental vaginal deliveries(4, p317) and increased use of oxytocin for labor stimulation (5). The question whether the incidence of Caesarean section is higher when EA is used at the cervical dilatation of less than 5cm remains under discussion (5, 6). EA is associated with several complications including maternal hypotension (7) and fetal bradycardia (8).

### Aim

Evaluate the possible correlation between epidural analgesia and operative delivery rates. Investigate the impact of epidural analgesia on labor, maternal and fetal condition. Compare EA group with the control group at Riga Maternity Hospital (RMH) and Paul Stradiņš Clinical University Hospital (PSCUH) "Maternity Care Center".

### Objectives

Collect medical records in year 2014 from archives of PSCUH "Maternity Care Center" and RMH. Divide medical records into two groups: deliveries with EA and control group. Compare two groups on the following grounds: need for Caesarean section, vacuum extraction or forceps delivery, duration of first and second stages of labor among primiparous and multiparous women, cervical opening at the beginning of EA, use of oxytocin for labor stimulation, Apgar score and the incidence of maternal hypotension.

### Methods

We conducted a retrospective research of 2596 clinical records in year 2014. All records were collected from archives of PSCUH and RMH. 636 pregnant women were selected to EA group, and 900 to control group. EA and control group were compared. Data collection and statistical analysis were performed using SPSS 22.0 and Excel 2010.

## Results

The incidence of Caesarean section in EA group was higher comparing to the control group: 13.5% (n = 86) vs. 8.7% (n = 78) p = 0.001. The rates of Caesarean section in the group where EA was begun at the cervical dilatation less than 5cm was higher than in the group where EA was begun at the cervical opening of more than 5cm: 18.55% vs.10.28%, p = 0.004. First period of labor was longer in EA group than in control group: mean duration 9h 48min vs. 8h 6min, p < 0.0001 (SD = 4.112 vs. SD = 3.688) for primiparous women and 7h 6min vs. 6h 12min, p < 0.01 (SD = 3.123 vs. SD = 3.538) for multiparous women. Second period of labor was longer in EA group than in control group: mean duration 1h 36min vs. 1h 6min, p < 0.0001(SD = 1.697 vs. SD = 1.735) for primiparous women and 42min vs. 24min, p < 0.01 (SD = 0.760 vs. SD = 0.985) for multiparous women. EA was associated with an increased need for oxytocin stimulation: 58.49% (n = 372) vs. 26.88% (n = 242) p < 0.00001. No statistically significant relation was found between the use of EA and the rates of vacuum extraction: 2.4% vs. 2.6%, p = 0.403. Forceps delivery was practised in neither of the two groups. EA was not associated with maternal hypotension: 3.8% vs. 2.8%, p = 0.139. No difference between EA group and control group occurred in the Apgar score at 1st minute (p = 0.718, SD ± 1.40510 vs. SD ± 1.28151) and at 5th minute (p = 0.875 SD ± 3.48922 vs. SD ± 1.28675) after birth.

## Conclusions

The research proved that the use of EA increases the need for acute Caesarean section. The rates of Caesarean section were higher in the group where EA was begun at the cervical dilatation less than 5cm. The EA prolongs the first and the second stage of labor for both primiparous and multiparous women. EA is associated with an increased need for oxytocin stimulation. These results coincide with the information mentioned in publications and similar studies. Statistically significant correlation between the use of EA and maternal hypotension, as well as with decreased Apgar score was not confirmed. This study should be continued to investigate other possible side effects of EA.

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# HERPES VIRUS CHARACTERISTICS IN FAMILY MEDICINE

*Justīne Brūvere*

*Supervisor of the abstract: Angelika Krūmiņa*

*Rīga Stradiņš University, Latvia*

## Introduction

There are several DNA viruses that belong to herpesviridae family. Most widespread among population are seven types of herpesviridae: Herpes simplex virus (HSV-1), Human herpes virus 2 (HHV-2), Varicella zoster virus (VZV), Epstein-Barr virus (EBV), Cytomegalovirus (CMV), Human herpes virus 6 and 7 (HHV-6 and HHV-7). There is also Human herpes virus 8 (HHV-8). In my research I did not include this type of virus, because it causes Kaposi's sarcoma, commonly occurring in AIDS patients which are not treated in family medicine. More than 90% of adults are infected with one or more types of herpes virus with higher incidence in immunosuppressed people. Virus usually exists in latent form for years. I analyzed incidence of herpes virus infected patients in family medicine.

## Aim

To examine incidence of herpes virus infection types in family doctor's practice and to analyze connection between demographic data, clinical symptoms, diagnosis, treatment options and number of patient's visits due to herpes infection.

## Objectives

1. Analyse one family doctor's practice history cases of patients older than 18 years.
2. Select all the cases where herpes virus infection is mentioned.
3. Detect correlations between different factors connected with herpes virus.
4. Draw conclusions of collected data.

## Methods

In retrospective cross-sectional study 1008 patient cases were analyzed in one family doctor's practice located in Riga, Latvia. Any signs for herpes infection during last 7 years were looked for. 50 patient (18+ years) history cases were selected. Following data were analysed: demographic, clinical findings, laboratory findings, treatment, co-morbidities. Statistical analysis were calculated using MS Excel and SPSS-19.

## Results

1008 patient cases of Riga city family doctor's practice 'X' were analyzed. At least 18 year old patients who have had at least one visit due to herpes infection in last 7 years were included (n = 50; 4.96% of all cases). Females (34; 68%) with mean age 33 ± 14.2 years were more (p < 0.001) than males (16; 32%) with mean age 34 ± 16.4 years. Due to herpes infection 37 (74%) patients had one visit to family doctor, but 13 (26%) patients had two or more visits. Diagnosis set only from clinical symptoms in 23 (46%) cases. In 27 (54%) cases clinical symptoms and serologic studies were used. Most frequently HSV-1/HHV-2 were diagnosed (p = 0.047) in 21 (39.6%) cases; mean age 31; 11 (52%) patients had immunosuppressing disease (hepatitis B, seronegative spondylopathy, bronchial asthma, rheumatic polyneurialgia, atopic dermatitis) or condition (smoking >20 cigarettes a day, increased physical load, missed abortion, pregnancy). VZV in 13 (24.5%) patients; mean age 42. Immunosuppressing disease in 5 (38.5%) cases (bronchial asthma, systemic lupus erythematosus, chronic urticarial, hepatitis B). EBV diagnosed for 11 (20.8%) patients; mean age 27 years. Immunosuppressing disease for 3 (27.3%) patients (autoimmune thyroiditis, rheumatic polyneurialgia). CMV in 6 (11.3%) patients; mean age 41 years. Immunosuppressing disease in 5 (83.3%) cases (psoriasis, seronegative spondylopathy, bronchial asthma, rheumatic polyneurialgia). HHV-6 and HHV-7 only in 2 (3.8%) patients; mean age 49 years. Immunosuppressing disease in 1 case – type 2 diabetes mellitus. Combination of more than one herpes type in 3 (6%) patients; all have immunosuppressing conditions. Specific antiviral treatment (local or systemic) was prescribed to 9 (18%) patients. Only symptomatic relief treatment for 19 (38%) patients. Both specific and symptomatic in 17

(34%) cases. 5 (10%) cases without treatment prescription.

### Conclusions

In family medicine doctors practice from 1008 patient cases during 7 years 50 (4.96%) had one or more episodes of documented herpes infections. Most frequent herpesviridae type is HSV-1/HHV-2 in 39.6%. Females (68%) have more frequent herpes infections than males. 57.1% of all diagnosed cases have immune compromising diseases or conditions. But more information would be needed from patient cases to make more precise conclusions.

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## IMMUNOHISTOCHEMICAL CHARACTERIZATION OF MULTIPLE AND SOLITARY MENINGIOMAS

*Baiba Vikmane, Sintija Pilāne*

*Supervisor of the abstract: Arvīds Jakovļevs*

*Riga Stradins university, Latvia*

### Introduction

Meningiomas are common primary tumours of brain meninges. These neoplasms develop from arachnoidal cap cells. Most meningiomas are benign and correspond to World Health Organization (WHO) grade I (1). Their prognosis is equally good for both solitary and multiple tumours (2). Although it is well known, that meningiomas express sex-hormone receptors (3), only few studies have focused on hormone receptor differences between solitary and multiple meningiomas. CD56 (neural cell adhesion molecule or NCAM) is a cell surface glycoprotein molecule that exists in different isoforms and acts through different pathways, providing multiple functions (4). Some authors have described CD56 impact on tumour progression and dissemination (5-7). NCAM expression has been found in solitary meningiomas (8-10), but expression in multiple meningiomas has not been studied before.

### Aim

To evaluate immunohistochemical differences in solitary and multiple meningiomas.

## Objectives

In order to reach the aim, objectives were 1) to retrieve all consecutive samples of multiple meningioma cases in time period from 2011 to 2013 and 20 consecutive archived samples of solitary meningioma as control group; 2) examine the identified tumours by immunohistochemistry for estrogen (ER), progesterone receptors (PR), Ki-67 and CD56 and 3) compare the two groups to find if there is a significant difference in expression of markers mentioned above.

## Methods

In a retrospective case-control study 11 multiple meningioma and 20 solitary meningioma materials were analysed. Immunohistochemical visualization was performed to detect ER, PR, Ki-67 and CD56. Data were analysed using IBM SPSS Statistics 22.0 software; p values less than 0.05 were regarded as statistically significant.

## Results

PR were expressed in all samples, with statistically significant lower mean expression in multiple meningiomas ( $p = 0.002$ ). The mean expression of PR in multiple meningiomas was 30.1% [95% confidence interval: 10.4-49.8], compared to 70.6% [56.6-84.8] in solitary meningiomas. ER expression was negative in both groups. The mean expression of CD56 was significantly ( $p = 0.049$ ) higher in multiple meningiomas than in control group: 48.3% [25.8-70.8] versus 24.6% [13.2-36.0], respectively. Solitary meningiomas expressed CD56 in 80.0% of cases. There was no significant difference in Ki-67 proliferation antigen expression between both groups. In addition, heterogeneity of PR and CD56 expression as well as diverse histological types was found in multiple meningiomas from the same patient.

## Conclusions

Our study is among the first that has revealed novel biological differences between multiple and solitary meningiomas by the implementation of immunohistochemistry for protein studies. Multiple meningiomas are characterised by significant down-regulation of PR expression— marker that has been previously associated with clinical course. The statistically significant up-regulation of CD56 in multiple meningiomas can indicate neural differentiation and/or peculiarities of cell adhesion and signalling that facilitate proliferation in multiple foci. Diverse histological types as well as PR and CD56 expression in separate meningiomas within same patient indicates multicentric origin.

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# IN COMPUTED TOMOGRAPHY DIAGNOSED COLONIC DIVERTICULOSIS PATTERN AND DISTRIBUTION

*Krista Nitina*

*Supervisor of the abstract: Peteris Prieditis*

*Riga Stradins University, Latvia*

## **Introduction**

Nowadays diverticular disease is the most common morphological abnormality of the colon and the fifth most important gastrointestinal disease in terms of cost in the Western world.[1;2] Diverticulosis can result from biological behavioural: physical inactivity, obesity, lack of intake of dietary fibre or genetic causes.[3] Colonic diverticulosis in the Western world are predominating in the sigmoid colon.[4] In Western countries the prevalence in population under 40 years is 5%-10%. It affects approximately 50% of the population above the age of 70 years and reaches 60%-80% in the population over 80 years.[2;4] Diverticular disease most frequently presents as uncomplicated diverticulitis. Symptoms develop in about one quarter of the affected individuals with complications in one-third of the symptomatic patients.[2] Diagnosis is mostly confirmed by colonoscopy, but abdominopelvic computed tomography (CT) is the most sensitive for the diagnosis of complicated severe diverticulitis.[2;5] In order to avoid complicated cases it is important to predict the possibility of diverticulosis. So that prophylactic measures may get started.

## **Aim**

The aim of this study was to determine the pattern and distribution of colonic diverticulosis diagnosed in abdominopelvic computed tomography and to determine the frequency of symptomatic process occurrence.

## **Objectives**

To estimate the radiological spectacle of abdominopelvic CT in order to assess the pattern and distribution of diverticulosis in different parts of the colon. Identify association between diverticulosis distribution and demographic parameters. Determine frequency of symptomatic process occurrence.

## **Methods**

146 radiological conclusions with the examination diagnosis of diverticulosis were selected from Institute of Diagnostic Radiology of Pauls Stradins Clinical University Hospital in Riga, Latvia from January to December 2014. To analyze age and gender 139 records were valid; excluding criteria: information about patient profile was insufficient. To analyze the pattern and distribution of colonic diverticulosis diagnosed in abdominopelvic CT 115 records were valid; excluding criteria: abdominopelvic CT investigation was insufficient. All 115 abdominopelvic CT investigations were repeatedly analysed by the author to gain data for further analysis. Data were analyzed using MS Excel. Data are presented as numbers of intervention, percentage, or means.

## **Results**

From 139 patients 66,2% were women, 33,8% men. With mean age  $71 \pm 11,48$ . From all diverticulosis cases 2,9% patients were in group under 40 years, 14,4% were in group 41-60 years, 61,2% - in group 61-80 years and 21,6% - in group patients older than 80 years. The apportionment between men and women in group under 40 years was equal, but in age group 41-60 it was 70% women and 30% men, in age group 61-80 it was 67,1% versus 32,9% and in age group over 80 - 63,3% versus 36,7% respectively. The sigmoid colon was affected in 97,4% of 115 diverticulosis patients, descending part of the colon was affected in 65,2%, transverse colon in 14,8% of the cases, ascending colon in 9,6%, but caecum in 2,6%. There were no cases when the right side of the colon including transverse colon was affected alone. Whereas in 2,6% of the cases descending part and in 34,8% of the cases sigmoid colon was affected isolated. From 115 diverticulosis patients 29,6% had diverticulitis. Women and men distribution in diverticulitis group was 73,5% versus 26,5%. From all women with diverticulosis 34,2% had diverticulitis and from all men with diverticulosis 21,4% had diverticulitis. From diverticulosis patients in group under 40 years 50% had diverticulitis, in group 41-60

years diverticulitis were in 47%, in group 61-80 years – 22,9% and in group patients older than 80 years – 33,3%.

### Conclusions

The occurrence of diverticulosis and distribution in the colon of it is higher after 60 years of age. After 40 years of age diverticulosis mostly affects women, before this age frequency is equal in both genders. In CT diagnosed diverticulosis the diverticula mostly appeared in the left side of the colon. Right side of the colon was never affected isolated. Diverticulosis in caecum, ascending part of the colon or in transverse colon appears if there already is diverticulosis in left side of the colon. Diverticulitis develops in one-third of all diverticulosis diagnosed in CT. The possibility of diverticulitis to occur is higher in patients younger than 40 years.

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## LV CHANGES AFTER MODIFICATION OF SYMPATHETIC TONE BY RENAL ARTERY SYMPATHETIC DENERVATION

*Kamilė Čerlinskaitė*

*Supervisor of the abstract: Andrius Berūkštis*

*Vilnius University Faculty of Medicine, Lithuania*

### Introduction

Hypertension is defined as resistant to treatment when arterial blood pressure consistently exceeds target values despite appropriate lifestyle changes and accurate treatment with a diuretic and two other antihypertensive drugs of unique classes at optimal or best tolerated doses [1]. Meta-analysis of large clinical trials suggests that resistant arterial hypertension (RAH) is common, involving about 20% to 30% of treated patients [2]. Multiple trials have revealed that RAH is associated with a significantly higher risk of cardiovascular, cerebral and renal events compared to controlled AH [3-5]. In recent years, there has been a growing interest in renal artery sympathetic denervation (RASD) as an innovative treatment for RAH [6]. Although initial clinical trials revealed encouraging BP lowering effects and led to the procedure being widely acclaimed, Simplicity HTN-3, the only sham-controlled trial, failed to show its superiority over medical therapy [7]. Nonetheless, it has been suggested that RASD could be used in managing other pathologies caused by overactivation of sympathetic nervous system (SNS) [8]. Adrenergic activation is responsible for cardiac remodeling, leading to hypertension-related morbidity and mortality, independent from BP values [9].

### Aim

The aim of our study was to investigate the impact of renal artery sympathetic denervation (RASD) on cardiac morphology parameters in patients with resistant arterial hypertension.

## Objectives

We evaluated RASD effects on cardiac morphology (particularly left ventricle measurements) and compared the results to the changes of hemodynamic parameters in patients with RAH prior and 6 months after the procedure.

## Methods

The prospective, non-randomized, single centre study was executed at Vilnius University Hospital Santariskiu Klinikos, enrolling 38 (age  $56.29 \pm 7.11$ , 18 (47.4%) male, mean office BP  $191/107 \pm 25/12$  mmHg, using  $5.97 \pm 1.3$  antihypertensive drugs) patients with confirmed RAH, who underwent bilateral RASD between March 2012 and September 2014. Procedure was performed using Simplicity (Ardian Inc.) catheter and radiofrequency generator. After gaining femoral access, renal angiograms were acquired to confirm anatomic eligibility. Then through guiding catheter denervation catheter was introduced and 4 to 6 ablations were performed moving spirally from distal end of artery to ostium proximally. In each point, ablation was performed for 2 minutes; radio frequency energy delivery was regulated automatically. In case of dual renal arteries or additional renal arteries, which were 4 mm or greater diameter, standard ablation technique was proceeded. Patients' cardiac morphology was examined using two-dimensional echocardiography. The following LV measurements were obtained: interventricular septal end-diastolic thickness (IVST<sub>d</sub>), left ventricular posterior wall end-diastolic thickness (LVPWT<sub>d</sub>), left ventricular end-diastolic internal diameter (LVID<sub>d</sub>). Left ventricular mass index (LVMI<sub>us</sub>) and relative wall thickness (RWT) were calculated using formulas including previously mentioned parameters. 24-hour ambulatory BP measurements were performed. All the data was collected before and 6 months after the RASD. Statistical analysis was performed using IBM SPSS Statistics 22 software. Data was considered significant if p-value was smaller than the significance level ( $\alpha = 0.05$ ).

## Results

There was a statistically significant reduction in 24-hour ambulatory BP from  $163/97 \pm 19/14$  to  $148.89 \pm 20/10$  mmHg ( $p = 0.002$  for systolic BP;  $p = 0.007$  for diastolic BP). Furthermore, LV hypertrophy measurements - IVST<sub>d</sub> (from  $1.18 \pm 0.27$  cm to  $1.09 \pm 0.19$  cm,  $p = 0.01$ ), LVPWT<sub>d</sub> (from  $1.11 \pm 0.22$  cm to  $1.02 \pm 0.12$  cm,  $p = 0.005$ ), LVMI<sub>us</sub> (from  $119.09 \pm 36.78$  g/m<sup>2</sup> to  $107.78 \pm 24.59$  g/m<sup>2</sup>,  $p = 0.01$ ) and RWT (from  $0.42 \pm 0.09$  to  $0.38 \pm 0.6$ ,  $p = 0.008$ ) all decreased significantly. LVID<sub>d</sub> measurements revealed no important changes (from  $5.37 \pm 0.49$  cm to  $5.45 \pm 0.5$  cm,  $p = 0.174$ ). An important finding was that there were no significant correlations between BP and LVH decrease: RWT and 24-hour SBP reduction Spearman's correlation coefficient  $-0.09$ ,  $p = 0.649$ ; RWT and 24-hour DBP reduction Spearman's correlation coefficient  $-0.187$ ,  $p = 0.341$ .

## Conclusions

RASD significantly lowers both BP and LVH measurements. Moreover, LVH decrease is an independent RASD effectiveness marker (not associated with BP decrease). It is a prominent finding, especially having in mind that RASD fate is still debatable, which should be confirmed in a larger, randomized trial.

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## METABOLIC DISORDERS IN PATIENTS WITH METABOLIC SYNDROME WITH OR WITHOUT STABLE ANGINA PECTORIS

Marcel Abras, Viorica Ochisor, Georgheta Mihalache, Andrei Grib

Supervisor of the abstract: Valeriu Revenco

State University of Medicine and Pharmacy "Nicoale Testemitanu", Republic of Moldova

### Introduction

Cardiovascular disease (CVD) and metabolic syndrome are major public health problems worldwide [1]. Risk factors, such as hypertension, atherogenic dyslipidemia, insulin resistance, glucose intolerance, abdominal obesity – as part of metabolic syndrome – play an important role in initiating and accelerating the complex process of atherosclerosis [2]. Constellation of interrelated risk factors of metabolic origin appear to directly promote the development of atherosclerotic cardiovascular disease [3].

### Aim

Aim of this study was to determine the differences in metabolic disorders in patients with metabolic syndrome (MS) with or without stable angina pectoris (SAP).

### Objectives

Assess serum lipid profiles, glucose metabolism parameters and insulin resistance (IR) in patients with MS and SAP vs. patients with MS without SAP.

### Methods

This study included 122 patients with metabolic syndrome (mean age  $54.06 \pm 0.86$  years). The diagnosis of MS was established according to criteria proposed by IDF and AHA/NHLBT in 2009. All patients with MS and clinical signs of SAP undergo bicycle exercise stress test (EST), unless contraindicated. Depending on EST results, there were selected 66 (54.09%) patients with SAP and positive EST (group I) and 56 (45.9%) patients with negative EST (group II, control). Following evaluation included laboratory investigations: total cholesterol (TC); LDL cholesterol (LDL-C); HDL cholesterol (HDL-C), triglycerides (TG) and TC/HDL-C ratio  $\geq 4,2$ ; fasting plasma glucose (FPG), serum insulin and IR measured by Homeostasis Model Assessment-Insulin Resistance (HOMA-IR), in both groups. IBM SPSS Statistics 20.0 software was used for statistical analysis.

### Results

Lipid profile assessment revealed that the mean value of TC for patients in group I was  $5.63 \pm 0.14$  mmol/l vs  $5.42 \pm 0.15$  mmol/l for patients in group II ( $p > 0.05$ ). The mean LDL-C in group I patients was  $3.46 \pm 0.11$  mmol/l vs  $3.25 \pm 0.13$  mmol/l in group II patients ( $p < 0.05$ ). In group I patients we estimate a mean HDL-C value of  $1.23 \pm 0.04$  mmol/l vs  $1.27 \pm 0.04$  mmol/l in group II patients ( $p > 0.05$ ). As for TG findings, the average value was  $2.22 \pm 0.1$  mmol/l in group I patients vs  $1.95 \pm 0.13$  mmol/l in group II patients ( $p > 0.05$ ).

When considering the frequency of dyslipidemia, we found TC values  $\geq 4.5$  mmol/l in 59 patients (95.16%) from group I vs 46 patients (82.14%) from group II ( $p < 0.05$ ). Values of LDL-C  $\geq 2.5$  mmol/l were found in 48 patients (87.27%) from group I vs 44 patients (78.57%) from group II ( $p > 0.05$ ). Analysis of TG levels  $\geq 1.7$  mmol/l revealed significant higher rates of hypertriglyceridemia in group I patients (82.26%,  $n = 51$ ) vs group II patients (48.21%,  $n = 27$ ) ( $p < 0.001$ ). HDL-

C assessment demonstrated values 0.05). Also an increased atherogenic index, as determined by the ratio of TC / HDL-C, was proven in both groups (group I -  $4.7 \pm 0.17$  vs group II -  $4.3 \pm 0.12$ ,  $p > 0,05$ ). In group I we determined values of TC/HDL-C ratio  $\geq 4.2$  in 36 patients (58.06%) vs 23 patients (41.07%) in group II ( $p > 0.05$ ).

The mean values of FPG in group I patients were  $5.61 \pm 0.10$  mmol/l vs.  $5.51 \pm 0.25$  mmol/l in group II patients ( $p < 0.05$ ). The number of patients who had a FPG  $> 5.6$  mmol/l was 32 (51.61%) in group 1 vs. 19 (33.93%) in group II ( $p > 0.05$ ). Mean fasting serum insulin level in group I patients was  $14.33 \pm 0.91$   $\mu$ U/ml vs.  $9.98 \pm 0.71$   $\mu$ U/ml in group II patients ( $p < 0.001$ ). The number of patients with a serum insulin level over 12.2  $\mu$ U/ml was 28 (53.85%) in group I patients vs. 11 (26.83%) in group II patients ( $p < 0.01$ ). HOMA-IR index had an average value of  $3.53 \pm 0.23$  in group I patients vs.  $2.1 \pm 0.15$  in group II patients, the difference being statistically significant ( $p < 0.001$ ).

### Conclusions

In both groups of patients we determined abnormal lipid profiles. To be also mentioned the presence of a larger number of patients with TC and TG values exceeding the allowable limits in the group with metabolic syndrome and stable angina pectoris.

In patients with metabolic syndrome those with stable angina pectoris had prevalent higher values of fasting plasma glucose, serum insulin and insulin resistance compared with those without stable angina pectoris.

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## MORTALITY AND CAUSES OF DEATH OF PATIENTS ON RENAL REPLACEMENT THERAPY IN LATVIA

*Andra Pekša, Anastasija Tarasova  
Supervisor of the abstract: Harijs Čerņevskis  
Riga Stradins University, Latvia*

### Introduction

Aging of society and increasing prevalence of diabetes and hypertension have resulted in an increased burden of end-stage renal disease (ESRD) that impacts the use of renal replacement therapy (RRT) worldwide [1]. RRT variation between countries has been associated with demographic, economical and organizational differences and a connection has been established between macroeconomic factors and dialysis survival outcomes [2]. Patients receiving RRT have high mortality and this study investigates patient mortality and main causes of death in Latvia within period of one year.

### Aim

Aim of the study is to analyze patient being treated with RRT mortality and causes of death in Latvia and its possible relation to RRT modality, patient age and gender.

### Objectives

Compile the available data on incident and prevalent RRT patients in Latvia in 2013; explore patient mortality one year after the start of RRT and analyze mortality depending on the applied RRT modality, patient age and gender; identify the main RRT patient causes of death.

## Methods

Retrospective study using Latvian Renal patient registry data was conducted. Patients, who received RRT in Latvia in 2013, were included into the study. Data were systemized and analyzed using Microsoft Excel 2007 and IBM SPSS Statistics 20.0 softwares, survival was analyzed using Kaplan-Meier method.

## Results

961 patients received RRT in 2013, from whom 353 (37%) were on hemodialysis (HD), 86 (9%) on peritoneal dialysis (PD) and 520 (54%) patients after kidney transplantation. There were 137 patient deaths – 104 HD, 21 PD patients and 12 transplant recipients died. The main causes of death were cardiovascular and cerebrovascular complications, accounting for 40,2% and 23,9%. For patients on HD more common were cardiovascular complications, on PD – cerebrovascular complications, but for renal transplant recipients – malignancy. Cardiovascular complications more frequently are observed in the age groups 55 – 64 and > 75, while cerebrovascular in younger patients – 20 – 54 years of age.

126 patients started RRT in Latvia in 2013. Mean age was  $60,44 \pm 15,77$  (95% CI: 57,66 – 63,23), 59,5% were men and 90,5% started hemodialysis (HD). Within one year 23 of incident patients died. Patient 30 and 90 day survival on dialysis was 96,8% and 88,8% respectively. Overall 81% of HD and 86% of PD patients survived after one year on dialysis. Early mortality is higher for patients on hemodialysis than on peritoneal dialysis ( $p = 0,042$ ), but no statistical significance is found of age ( $p = 0,4$ ) or gender ( $p = 0,4$ ) influence on early patient mortality. The main causes of death were cardiovascular complications and infection, accounting for 33% and 17%

## Conclusions

1. The highest patient mortality is in the first three months after starting dialysis and it is higher for patients on hemodialysis than on peritoneal dialysis ( $p = 0,042$ ), but no statistical significance is found of age ( $p = 0,4$ ) or gender ( $p = 0,4$ ) influence on early patient mortality
2. Mortality rates gradually decrease over a period of the first year of dialysis - 81% of HD and 86% of PD patients survived after one year on dialysis
3. The main causes of patient death on dialysis are cardiovascular and cerebrovascular complications, but for patients after kidney transplantation – malignancy.
4. Cardiovascular complications more frequently are observed in the age groups of 55 – 64 and > 75 years, while cerebrovascular in younger patients – 20 – 54 years of age.
5. In early mortality the main causes of death are cardiovascular complications and infection.

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## NEWBORN ANTHROPOMETRIC MEASUREMENTS IN SINGLETONS AND TWINS AND INTRAUTERINE TWIN GROWTH DISCORDANCE

*Krista Mize, Ilze Barone*

*Supervisor of the abstract: Inara Miltina*

*Department of Obstetrics and Gynecology, Riga Stradiņš university, Latvia*

### Introduction

The number of multifetal births have increased significantly on the global level during the past 30 years, primarily due to the increased use of assisted reproduction technology, fertility drugs for ovulation induction, but also in part due to older maternal age at childbirth, which is known risk factor for spontaneous dizygotic twinning. In Latvia, between

years 1980 and 2013, the twin rate increased from 0.78% to 1.28% of all deliveries, but in Europe this rate now comprise 1.6%. Multiple gestations are one of the common high-risk conditions encountered by obstetricians. Compared to singletons, twins are more likely to be affected by lower anthropometric parameters which can be associated with higher morbidity and mortality, especially regarding infants with intrauterine fetal growth restriction. Special features of placental blood circulation in monochorionic (MH) twin pregnancy can affect fetal growth more likely than in dichorials (DH).

### **Aim**

The aim of this study is twofold: 1) to determine the differences in anthropometric measurements in singletons and twins, depending on their chorionicity and evaluate the frequency of intrauterine fetal growth restriction; 2) to diagnose intrauterine growth discordance in MH and DH twin pairs.

### **Objectives**

To include patients with monochorionic, dichorionic twin deliveries and deliveries with singletons as a control group in Riga Maternity hospital, use data from medical records which include newborn anthropometric measurements with weight, height and head circumference, and, finally, perform statistical processing.

### **Methods**

This was a retrospective cohort study of deliveries in Riga Maternity hospital, including all deliveries with MH twins (n = 100) from January 2009 to November 2014, all with DH twins (n = 100) from September 2013 to December 2014. Deliveries with singletons (n = 200) were selected as a control group according to the principle that they were chosen as the very next delivery after each twin newborn pair, analyzing data of 600 newborns overall. Gestational age of newborns in this study was 24 – 41 weeks. The percentiles of newborn anthropometric measurements were determined with *Royal College of Paediatrics and Child Health* neonatal growth assessment score. Intrauterine fetal growth restriction is diagnosed if weight of infant was less than the 10th percentile. Differences in discordant growth between MH and DH twin pairs were assessed by difference of weight, height and head circumference percentiles in each twin pair. Frequency of discordant twin pairs was determined if weight difference is 20% and more in each twin pair. Obtained data were statistically processed with *Microsoft Excel* 2010 and *IBM SPSS Statistics* v. 22.

### **Results**

There is statistically significant difference in anthropometric measurements in MH, DH twins and singletons. The difference of mean weight percentiles in MH was  $31.58 \pm 1.88$ , DH -  $45.43 \pm 2.23$  and singletons -  $61.57 \pm 1.94$ ,  $p < 0.001$ ; height percentiles ( $52.6 \pm 2.57$ ;  $63.5 \pm 2.57$  and  $87.16 \pm 1.36$ ,  $p < 0.001$ ) and head circumference ( $50.56 \pm 2.38$ ;  $60.71 \pm 2.40$  and  $66.66 \pm 2.01$ ;  $p < 0.001$ ). 78 of all 600 newborns, analyzed in this study, had intrauterine fetal growth restriction, 49 of them were MH (24.5% (49 of 200) newborns of MH twin deliveries), 19 were DH (9.5% (19 of 200) and 10 in control group with singletons – 5% (10 of 200). The difference of birth weight percentile in each newborn twin pair showed that there is significant difference in MH compared to DH twins ( $21.60 \pm 2.02$  vs.  $20.46 \pm 1.68$ ,  $p = 0.034$ ), but there is no statistically significant difference in length and head circumference percentile ( $p = 0.37$  and  $p = 0.81$ ). Frequency of discordant twin pairs comprise 27% (27 of 100) in MH and 23% (23 of 100) in DH, but average percentage among newborn twin pairs which are classified as discordant – 37% (range 20% to 107%) vs. 27.4% (range 20% to 72%).

### **Conclusions**

- 1) Compared to singletons, twins displayed significantly lower anthropometric measurements and also increased incidence of the fetal intrauterine growth restriction, and it more likely affected monochorials.
- 2) Fetal growth differences by their weight, is more often in MH than DH twin pairs, but there is no difference in length and head circumference. Between twin pairs, diagnosed as discordants, MH pairs showed more severe twin growth discordance than DH, because, discordance at the level 30% and more, is associated with significant fetal mortality.

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## NON-MUSCLE INVASIVE BLADDER CANCER. PERIOPERATIVE ASSESSMENT AND COMPLICATIONS

*Janis Margevicus, Madara Bronica, Liva Jenerte*

*Supervisor of the abstract: Vilnis Lietuvielis*

*Riga Stradins University, Latvia*

### Introduction

European Association of Urology suggests that bladder cancer (BC) is the most common malignancy of the urinary tract. 75% of all bladder cancers are non-muscle invasive – Ta, T1 and Tis stage. The average age of patients with bladder cancer is 67 years. The most important risk factor for bladder cancer is smoking – almost 50% of all patients were smokers. Early diagnosis is important for patients with bladder cancer. Successful treatment requires proper examination that begins with collection of patient's records, physical examination, laboratory and instrumental examinations. Transurethral resection of bladder cancer (TUR-BC) is essential in the diagnosis and determination of further treatment [1; 2; 3].

### Aim

The aim of this study was to make perioperative evaluation of non-muscle invasive bladder cancer and analyse complications after surgery. Data from patients who are suffering from non-muscle-invasive bladder cancer and have undergone transurethral resection of bladder cancer were collected and analysed by age, gender, smoking habits, symptoms, surgery duration, type, stage and grade of cancer and also complications after surgery.

### Objectives

Make perioperative evaluation of non-muscle invasive bladder cancer and analyse complications after surgery. Collect and analyse data by age, gender, smoking habits, symptoms, surgery duration, type, stage and grade of cancer and also complications after surgery. Compare obtained data with other studies. Create recommendations for better diagnosis and further treatment.

### Methods

In order to determine the perioperative assessment and complications of non-muscle-invasive bladder cancer, records of patients treated at the Urology Clinic of the Riga East University Hospital's Latvian Centre of Oncology, as well as Department 11 and day hospital of the hospital Gailezers from 1 January 2014 to 31 December 2014 were analysed in a retrospective study. The study includes 203 patients aged from 25 to 92.

### Results

25.13% (n = 51) of the patients were women and 74.87% (n = 152) of the patients were men. The average age of patients with non-muscle invasive bladder cancer was 68.37 years for women and 67.79 years for men. 64.04% (n = 130) of the patients didn't have any signs or symptoms. 34.48% (n = 70) of the patients complained about macrohematuria, whereas microhematuria was found in 1.48% (n = 3) of the patients. 46.79% (n = 95) of the patients were smokers, out of these 12.63% (n = 12) were women and 87.37% (n = 83) were men. After histopathological assessment all cancer cases were urothelial papillary carcinomas – 55.67% (n = 113) were in T1 stage, 28.57% (n = 58)

were in Ta stage, but carcinoma in situ (Tis) was found in 1,97% (n = 4) patients. T2 stage urothelial papillar carcinoma was diagnosed in 1.97% (n = 4) of the patients. Chronic bladder inflammation was found in 11.82% (n = 24) of all cases. The average duration of surgery was 27.59 minutes. Complications were found in 3.45% (n = 7) of the patients. 42.85% (n = 3) of the patients had injury of urethra, 14.29% (n = 1) had massive hematuria after surgery. One patient had secondary urinary tract infection. 28.57% (n = 2) of the patients had perforation of bladder. There wasn't any significant correlation between gender, age, duration of hospitalization, duration of operation and postoperative complications. In histopathological evaluation, detrusor muscle was found in 76.85% (n = 156) patients. TUR-BC has to be repeated for 23.15% (n = 47) of the patients.

### Conclusions

Discussion. From 203 patients 25,13% were women and 74,87% were men, which corresponds to the literature data from other studies, that men are affected three time more likely. Other studies describes the mean age of patients with non-muscle invasive bladder cancer is 65 years, but in this research it was 67,87 ( ± 11,94). Literature data suggests, that Ta stage NMIBC are diagnosed in 70%, T1 stage – 20% and CA in situ – 10% of all the cases. In this research Ta stage stage NMIBC were found in 28,57%, T1 stage cancer were found in 55,67%, CA in situ were found in 1,97%, same as T2 stage NMIBC. One of the aim of the research was to assess complications after TUR-BC. Literature data suggests, that complications appear in 5-6% of all the cases. In this research complications occurred in 3,45% of patients after TUR-BC. Accurate resection of detrusor muscle during TUR-BC is important for diagnosis un further treatment. In other studies is suggested, that lack of detrusor muscle in operation samples is associated with higher risk for cancer progression and recurrence. In this research detrusor muscle was not found in 23,15% of all cases, which means that those patients have to repeat TUR-BC. Conclusions. Bladder cancer is the most common malignant urinary tract disease. Early diagnosis is one of the most important step in treating non-muscle-invasive bladder cancer. Transurethral resection of bladder cancer is an important diagnostic and therapeutic method that allows to determine the exact diagnosis, as well as subsequent treatment and to predict life expectancy. Smoking is a major risk factor. More than 50% of the diagnosed non-muscle-invasive bladder cancer cases were in T1 stage, which may indicate a delay in early diagnosis. Transurethral bladder cancer resection is low risk operation, which can be done in relatively short time. In order to avoid repetitive operations and inaccurate diagnosis, it is important to make an accurate transurethral resection of bladder cancer.

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## OFF-PUMP TRANSAPICAL IMPLANTATION OF ARTIFICIAL CHORDAE TO CORRECT MITRAL REGURGITATION: THE INFLUENCE OF ROUTINE BASELINE 2D AND 3D ECHOCARDIOGRAPHY MEASURES ON THE SUCCESS OF THE PROCEDURE

*Gabija Janavičiūtė, Vilius Janušauskas*

*Supervisor of the abstract: Vilius Janušauskas, Kęstutis Ručinskas*

*Vilnius University, Faculty of Medicine, Lietuva*

### Introduction

Chordae replacement has been used with high reproducibility and excellent results for repairing leaflet prolapse for a long time (1). Chordae replacement required open-heart surgery with bypass to stop the heart while the repair is performed. The NeoChord DS1000 is a disposable device that is intended to replace damaged chordae by delivering artificial chordae tendinae or "neochords" in a beating heart through anterolateral mini-thoracotomy (2). In contrast

to the open heart surgery, where other repair techniques (such as ring annuloplasty, closure of clefts etc.) could be applied (3), this method is limited only to the implantation of artificial chordae, so preoperative evaluation of MV anatomy using 2D and 3D echocardiography carries extremely high importance in evaluating patient suitability for the procedure. Previous experience has showed that this procedure is effective in some patients, but patient selection is still being discussed.

### **Aim**

The aim of this study was to evaluate routine baseline 2D transthoracic echocardiography (2DTTE) and 3D – transesophageal echocardiography (3DTEE) measures. Identifying differences between patients with good and bad outcomes could help to improve the selection of candidates for NeoChord implantation procedure.

### **Objectives**

Thirty nine patients with severe MR (MR) and isolated or bileaflet MV (MV) prolapse underwent NeoChord implantation procedure with the NeoChord DS1000 system. Patients were divided into Successful procedure group (with 32 patients) and Non-successful procedure group (with 7 patients) 6 month after procedure, defining successful as  $\leq 2$  grade MR achieved (4). This study performed statistical analysis of the differences of the routine baseline 2DTTE and 3DTEE measures between these two groups, using Microsoft Excel 2011 14.4.7 and SPSS 22.0 software.

### **Methods**

This is a retrospective study of 39 patients with severe MR and isolated or bileaflet MV prolapse, who underwent NeoChord implantation procedure with the NeoChord DS1000 system. Data were collected from medical records. The follow up included discharge, 1 month and 6 month echocardiography. All patients completed six months follow up. Main selection criteria for the procedure was: severe MV incompetence (grade  $\geq 3+$ ), left ventricle (LV) ejection fraction  $>25\%$ . Exclusion criteria: functional or ischemic MR, severe LV dysfunction, infective endocarditis, inflammatory valve disease, leaflet perforation. Patients were divided into Successful procedure group (with 32 patients) and Non-successful procedure group (with 7 patients) 6 month after procedure, defining successful as  $\leq 2$  grade MR achieved (4). Preoperative left ventricle measurements (LV end diastolic diameter, LV end systolic diameter, left atrium volume), mitral valve characteristics (MV perimeter, MV area, anteroposterior (AP) diameter, mediolateral (ML) diameter, area and lengths of anterior and posterior MV leaflets, angles between anterior and posterior MV leaflet and MV annulus, tent height, depth of the prolapse) were compared in Successful and Non-successful procedure groups. Statistical analysis of the data was performed using Microsoft® Excel 2011 14.4.7 and IBM® SPSS 22.0 software, T-test and Chi-square test were carried out.

### **Results**

There were 23 male and 17 female patients. All patients had an ejection fraction greater than 55%. 50% of patients were in NYHA III. Median patient age was  $62 \pm 12$  years (33-84 years); median BMI was  $27,7 \pm 4$  kg/m<sup>2</sup> (19,6-38 kg/m<sup>2</sup>), mean GFR  $98 \pm 35$ ml/min (39-177ml/min), median logistic Euroscore II was  $0,88 \pm 0,66\%$  (0,46-3,14%). Preoperative left ventricle measurements: LV end diastolic diameter  $6,1 \pm 1$ cm (4,7-7 cm), LV end systolic diameter  $3,6 \pm 1$  cm (2,2-5cm), left atrium volume indexed  $73 \pm 21$ ml/m<sup>2</sup> (46-154ml/m<sup>2</sup>). MV dimensions: AP diameter  $35,7 \pm 7$ mm (26-57,5mm) and ML  $44 \pm 8$ mm (27,8-62,8mm), length of anterior MV leaflet  $21 \pm 5$ mm (13-36mm), length of posterior MV leaflet  $19 \pm 7$ mm (9-39mm), MV perimeter  $133 \pm 27$ mm (45-187mm), MV area  $1315 \pm 432$ mm<sup>2</sup> (650-2555mm<sup>2</sup>), height of tent  $3,4 \pm 2$ mm (0,5-10mm), area of anterior MV leaflet  $779 \pm 272$  mm<sup>2</sup> (375-1862mm<sup>2</sup>), area of posterior MV leaflet  $795 \pm 399$ mm<sup>2</sup> (261-1879mm<sup>2</sup>), angle between MV annulus and aortic valve  $147 \pm 13$  mm (119-186 mm). There were no significant differences in data mentioned above in both patient groups. Significant differences between Successful and Non-Successful procedure group were found in angle between MV annulus and posterior MV leaflet ( $11 \pm 9$  degrees vs  $21 \pm 8$ degrees,  $p = 0,016$ ); in angle between MV annulus and anterior MV leaflet ( $8 \pm 7,6$ degrees vs  $18 \pm 5,5$ degrees,  $p = 0,006$ ) and angle between anterior and posterior leaflets ( $169 \pm 21$ degrees vs  $139 \pm 12$ degrees,  $p = 0,006$ ), depth of the prolapse ( $9 \pm 4$ degrees vs  $5 \pm 3$ degrees,  $p = 0,038$ ).

## Conclusions

The study has showed that in successful patient group mitral valve leaflets were "shallower" comparing to MV annulus. Patients with leaflets tethered towards LV should be referred to conventional mitral valve repair, as ring annuloplasty is necessary for those patients to correct mitral valve incompetence effectively.

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## PATIENTS' PSYCHO-EMOTIONAL CHANGES DURING MAGNETIC RESONANCE IMAGING

*Anastasija Tarasova, Andra Pekša*

*Supervisor of the abstract: Jānis Dundurs*

*Riga Stradins University, Latvia*

### Introduction

Modern medicine is taking a huge step up. All countries are expending treatment and diagnostic facilities. One of diagnostic direction is radiology diagnostic that nowadays is able to detect in the early stages of serious illness and rescue a large part of patient. Unfortunately increasing not only number of organic etiology diseases, but also psycho-emotional nature of disease that influence on a human general state. The daily tension strongly influences human subconscious and develop psycho-emotional disturbances such as generalized anxiety disorder, insomnia, panic attacks, as well as a variety of specific phobias: claustrophobia, social phobia, etc. [1;2] Person, who have a high basal level of stress, and when happens most stressful situation such as magnetic resonance imaging (MRI), which he is unable to adequately withstand in this diagnostic test so this has negative effects on diagnostic capabilities.[3;4]

### Aim

To analyze noise effects on patients during MRI, using questionnaire and evaluate patients' discomfort associated with machine noise and other influencing factors, its possible relation to age or gender.

### Objectives

To analyze dicomfort's reasons, find out its expressions and possible relation to gender.

### Methods

A cross-sectional survey using questionnaires containing measures of subjective discomfort using Likert scale (general discomfort, dizziness, noisiness, feeling of cold or warm etc). Data were systemized and analyzed using IBM SPSS Statistics 20.0 software and survival was analyzed using Kaplan-Meier method.

### Results

In the study attend 150 patients. Patient age was from 19 to 83 years, mean age 44,04 (Std. Deviation 17,215). After the patient gender division: 106 women (70,7%, mean age 42 years) and 44 men (29,3%, mean age 48 years). Women investigated more often compared to men because men turn to doctors for help rarely than women. The reasons why so often both genders are attending MRI associated by CNS disease (32,7%), spinal disease (32%) and bone-joint system diseases (16,7%). 46% of patients didn't feel any discomfort during MRI procedure, but 54% of patients felt

some discomfort using MRI, while women associate the discomfort with noise more often (52% , men 32%,  $p = 0,036$ ). 38% of women are afraid of MRI more often than men ( $p = 0,009$ ) but men are sedated before MRI more frequent: men 23% but women 7% ( $p = 0,05$ ). Also men tend to sleep during MRI (45%, women 30%,  $p = 0,062$ ). There is statistically significant correlation by age groups (Spearman's rho) between the expressions of discomfort and age: the older women mentioned the general discomfort ( $p = 0,01$ ), headaches / dizziness ( $p = 0,013$ ) and unpleasant vibration feeling ( $p = 0,023$ ).

### Conclusions

1. A half of the MRI patients have problems during examination because of many reasons.
2. The active way of noise reduction requires huge investments, that is why in Latvia it is done in so called passive way where the most important is patient information and support. The cooperation of doctor and patients is proven to be one of the most effective methods, that's why it is necessary to improve it.

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## SYNTHESIS OF NEW 4-IMIDAZOLIDINONE DERIVATIVES TARGETING BCL-2

*Gytis Katkauskas*

*Supervisor of the abstract: Hiliaras Rodovičius*

*Department of Drug chemistry, Lithuanian University of Health Sciences, Lithuania*

### Introduction

World Health Organization (WHO) published data of GLOBOCAN:2012 project conducted by International Agency for Research on Cancer (IARC) that shows cancer as one of the leading causes of death in 2012 with estimated 8.2 million deaths worldwide [1]. Damage to the Bcl-2 gene has been identified as a cause of a number of cancers and resistance to cancer treatments [2]. Studies show that hydantoin derivatives induces DNA damage causing downregulation in the expression of antiapoptotic proteins like Bcl-2 [3]. Therefore 4-Imidazolidinone scaffold was selected for potentially active anti-cancer compound synthesis.

### Aim

To synthesize new 4-Imidazolidinone compounds targeting Bcl-2 protein based on *in silico* results.

### Objectives

1. To perform *in silico* evaluation of new 4-Imidazolidinone derivatives and determine the most potential ligands for Bcl-2 inhibition.
2. To synthesize new 4-Imidazolidinone derivatives.

3. To determine physico-chemical properties of synthesized compounds.

## Methods

In silico evaluation was performed with "Schrödinger 2014-2: small molecule drug discovery suite" [4]. First ligands were prepared by using "LigPrep 3.0" and "Qikprop 4.0" [4]. Then the most potential ligands for synthesis were determined by using "Glide 6.3" [4] based on their predicted interaction energy ( $\Delta E$ , kcal/mol) and predicted protein-ligand interactions. Synthesis of 4-Imidazolidinone derivatives were performed in 4 stages. First thiohydantoin scaffold was synthesized from glycine and ammonium thiocyanate. Then Knoevenagel condensation was performed with 2-Thiohydantoin and various aldehydes (e.g. benzaldehyde, 4-Bromobenzaldehyde) to get substitutes in 5th position. More complex 5-(substituted aryl)-2-furfuraldehydes used in this stage were produced by furfural arylation [5]. In the next stage intermediates were methylated with methyl iodide. Last stage were nucleophilic substitution in 2nd position with various amines (e.g. 4-Bromoaniline, 1-Aminonaphthalene). Compounds purified with active charcoal and recrystallization. The identity of compounds was confirmed by UV and IR spectroscopy. Purity was determined by various TLC solvent systems (e.g. ethyl acetate:hexane 1:1) and HPLC using gradient flow of 0.1% Trifluoroacetic acid (TFA):Acetonitrile on Waters 2695 with diode matrix detector Waters 996 PDA (Waters corp., Milford, USA). Melting points were determined with Kofler bench.

## Results

Virtual library of 5097 ligands was created for screening of potentially active compounds. Initially 808 ligands showed moderate or high predicted activity targeting Bcl-2. Screening with certain restrictions (e.g. logP between -0.4 and +5.6, molecular weight <500, predicted oral absorption >60%) lead to identify 45 ligands with favorable pharmacokinetic and molecular properties. Docking results analysis showed that predicted activity increases when ligand contains 4-fluorobenzaldehyde, 5-(substituted aryl)-2-furfuraldehydes in 5th position and 4-phenoxyaniline, 4-aminosalicylic acid, 4-aminobenzoic acid in 2nd position. According to the pose viewer results aromatic ring in 5th position occupied the same binding site as 4-Cl-Ph group of inhibitor 1E9 in the X-Ray crystallography structure (PDB ID: 4IEH) and interacts by  $\pi$ - $\pi$  stacking with Phe63. In some cases 4-phenoxyaniline in 2nd position exchange places and aromatic ring in 5th position interacts with Tyr161 instead. In addition to that ligand having 4-phenoxyaniline positions molecule closer to binding pocket allowing scaffold NH group interaction with Gly104 backbone by H-bond. One or both 4-phenoxyaniline phenyl rings interact with Phe63 and/or Tyr67 by  $\pi$ - $\pi$  stacking. 30 new compounds were successfully synthesized, their structure and purity were determined. 13 of them had high predicted activity ( $\Delta E \geq 6$  kcal/mol). HPLC analysis lead to identify 18 compounds with high purity level (80 – 99%).

## Conclusions

1. In silico screening lead to identify 45 ligands with high predicted activity ( $\Delta E \geq 6$  kcal/mol) while also having favorable pharmacokinetic and molecular properties.
2. 30 new 4-imidazolidinone compounds targeting Bcl-2 were successfully synthesized.
3. 18 of compounds had purity level between 80% and 98.97% and are suitable for future research. Synthesized compound interaction energy  $\Delta E$  varies between -4.274 and -7.629 kcal/mol towards Bcl-2.

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# SYNTHESIS OF NEW 4-THIAZOLIDINONES TARGETING BCL-2

Karolis Bernotavičius

Supervisor of the abstract: Hiliaras Rodovičius

Department of drug chemistry, Lithuanian University of Health Sciences, Lithuania

## Introduction

According to World Health Organization (WHO) data cancers figure among the leading causes of death worldwide, with approximately 8,2 million cancer related deaths every year. It is expected that annual cancer cases will rise by about 70% over the next 2 decades. [1]. Increased expression of the anti-apoptotic proteins is commonly associated with cancer cell survival and resistance to chemotherapeutics [2]. Treating them with new biologically active compounds possessing pro-apoptotic activity could cause death of cancer cells without harming regular ones [2] [3]. In this study, anti-apoptotic protein Bcl-2 was selected as a key target whereas 4-thiazolidinone was chosen as a scaffold for novel compounds based on its broad biological activity [3].

## Aim

To synthesize new 4-thiazolidinone derivatives targeting Bcl-2 based on *in silico* screening results.

## Objectives

1) To determine the most potential 4-thiazolidinones from created virtual library by performing *in silico* screening. 2) To synthesize selected new 4-thiazolidinone derivatives. 3) To determine physico-chemical properties of synthesized compounds.

## Methods

*In silico* screening was performed by using "Schrödinger 2014-2: small molecule drug discovery suite" [4] and 3D model of human Bcl-2 protein (PDB code: 4IEH) [2]. First, ligands were created and prepared for work by using "LigPrep 3.0" and "Qikprop 4.0" modules [4]. Then, the most potential ligands for synthesis were determined by using "Glide 6.3" module [4], based on predicted interaction energy ( $\Delta E$ , kcal/mol) and protein-ligand interactions. Synthesis of 4-thiazolidinone derivatives was done in 3 steps. First, 5-substituted compounds were prepared from rhodanine by performing Knoevenagel condensation. Next, intermediates were methylated in the position 2. Finally, 2,5-substituted-4-thiazolidinones were synthesized from various amines (e.g. D-(+)-Glucosamine) and amino acids (e.g. p-amino salicylic acid, 5-amino salicylic acid, p-amino benzoic acid) [5]. Synthesis of position 5 substituents 5-(4-substituted aryl)-2-furfuraldehydes was done in 2 steps. First, aromatic amines were converted into diazonium salts. Then, 4-substituted aryl fragments were introduced in the position 5 of furan ring by performing furfural arylation [6]. The identity of compounds was confirmed by means of UV and IR spectra. Purity analysis was done by TLC (ethyl acetate/hexane 1:1) and by HPLC (using gradient flow of 0,1% trifluoroacetic acid/acetonitrile, Waters 2695 with diode matrix detector Waters 996 PDA (Waters corp., Milford, USA)) methods. Melting points were determined by using Kofler bench.

## Results

Virtual library containing 13593 ligands was created [7]. Initially 2967 of them showed high predicted activity towards Bcl-2 ( $\Delta E$  up to -10,722 kcal/mol). Further screening with certain restrictions (e.g. predicted human oral absorption > 50%, Rule of Five violations  $\leq 1$ ) lead to identify 96 ligands with high binding affinity ( $\Delta E \leq -6$  kcal/mol) and optimal pharmacokinetic/molecular properties [7]. Docking results showed that predicted activity increases when ligand contains N-(1-naftil)-ethylenediamine, D-(+)-glucosamine or p-amino salicylic acid amides in the position 2 and aromatic substituents in the position 5. Aliphatic substituents in the position 5 significantly reduces predicted activity. According to the pose viewer results aromatic ring in position 5 occupied the same binding site as 4-Cl-Ph group of inhibitor 1E9 in the X-Ray crystallography structure (PDB code: 4IEH) and interacts by  $\pi$ - $\pi$  stacking with Phe63. Additional interactions were predicted depending on chosen substituents in the position 2 (e.g. p-amino salicylic acid

moiety interacts with Asn102 by H-bond, 5-amino salicylic acid moiety interacts with Gly104 by H-bond, 4-phenoxy aniline moiety interacts with Tyr161 by  $\pi$ - $\pi$  stacking). 21 new compounds were successfully synthesized with 80 – 97% yield in first step, 81 – 97% in second step and 28 – 98% in third step. The identity and structure of compounds was confirmed by means of UV and IR spectra. HPLC analysis lead to identify 10 high purity (85 – 99%) compounds.

### Conclusions

*In silico* screening lead to identify 96 ligands as potential Bcl-2 inhibitors. 21 new compounds were successfully synthesized with predicted interaction energy between -5,02 and -8,20 kcal/mol showing moderate to high predicted activity towards Bcl-2. Physico-chemical analysis showed 10 compounds that are suitable for future research because of high purity (85 – 99%).

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## THE ANALYSIS OF THE MOST COMMON INDICATIONS AND COMPLICATIONS OF TONSILLECTOMIES IN PAULS STRADINS CLINICAL UNIVERSITY HOSPITAL

*Sintija Pilane, Baiba Vikmane*

*Supervisor of the abstract: Gunta Sumeraga*

*Riga Stradins University, Latvia*

### Introduction

Tonsillectomy is a surgical procedure when the extirpation and resection of one or both tonsils are performed [1]. The most common indication for a tonsillectomy is the necessity to avoid chronic infection, which focus is situated in the tonsils (the treatment of chronic tonsillitis) [2]. In the first stages, chronic tonsillitis could be successfully treated pharmacologically. However, the positive results cannot always be achieved, and the surgical treatment may be necessary [3].

### Aim

The aim of the study was to summarize the most frequent indications for tonsillectomy, complications of tonsillectomy and patient profile by analysis of patient medical histories in Pauls Stradins Clinical University Hospital, Otorhinolaryngology clinic in year 2014.

### Objectives

In order to reach the aim, objectives were 1) to determine patient gender, median age, number of co-morbidity, average time in hospital, 2) to explore the most common indications for tonsillectomy, 3) to analyse the most common complications of tonsillectomy.

## Methods

Medical records of 208 patients in Pauls Stradins Clinical University Hospital, Otorhinolaryngology clinic who underwent tonsillectomy from 01.01.2014 to 31.12.2014 were retrospectively reviewed. We analyzed the most frequent indications for tonsillectomy and complications of tonsillectomy and patient profile of patient medical histories. Data was statistically created in Microsoft Excel 2007 software.

## Results

From 208 patients, 110 were men (53%) and 98 women (47%). Median age for woman was 35,99 years, for men- 30,72 years. Median patient age was 33,19 years. The number of co-morbidity was selected in 46 patients (22%). Median time in the hospital- 3,13 days. The main diagnosis was chronic decompensated tonsillitis- 170 patients, chronic subcompensated tonsillitis- 17 patients, chronic tonsillitis without a specification- 9 patients, acute tonsillitis- 8 patients, chronic tonsillopharyngitis- 3 patients and chronic compensated tonsillitis- 1 patient. **Hoddeson et al;** 2009 claim that the most common indication of 361 adult patients is chronic infection. 207 patients (57%) had chronic tonsillitis [4]. Bilateral tonsillectomy was performed in 166 cases (79,8%), in one case there was only left side tonsillectomy done (0,48%). For 40 patients (40%) bilateral tonsillectomy was a planned procedure as well as the only one unilateral tonsillectomy (0,48%). As an acute procedure, the tonsillectomy was performed for 60 patients because of the unilateral peritonsillar abscess, but six patients had bilateral peritonsillar abscesses (2,9%). **Page et al;** 2010 assure that peritonsillar abscess is the main indication for an acute procedure [5]. Postoperative complications had 2 patients (0,96%) . The most common complaints were following: 1 patient (0,48%) had bleeding from the operation site in the first 24 hours, 1 patient (0,48%) had temperature 38,1 degree Celsius as allergic reaction to anesthetic in the first 24 hours. **Windfur et al;** 2006 by collecting 15218 patients medical records observed that 0,2% to 2,2% of patients had postoperative bleeding in the first 24 hours but 0,1% to 3,7% of patients had postoperative bleeding from sixth to tenth day [6]. **Berry et al;** 2008 affirm that postoperative bleeding rates do not vary of acute and planned procedures [7]. The most common patients sensations were following: 70 patients (34%) had dry throat, discomfort in the throat, 47 patients (23%) had pain in the throat, 51 patients (24%) had swallowing difficulties.

## Conclusions

Most of cases tonsillectomy were done as an acute surgery because of the complications of chronic tonsillitis. There were no significant complications after both- planned and acute surgeries. By increasing tonsillectomy rate as a planned procedure, it would be possible to avoid complications of chronic tonsillitis.

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# THE EVALUATION OF COGNITIVE FUNCTIONS, PSYCHOLOGICAL DISTRESS, QUALITY OF LIFE AND IMPULSIVENESS IN PATIENTS WITH ATRIAL FIBRILLATION

Aurelija Navickaitė

Supervisor of the abstract: Rokas Šerpytis

Department of Cardiology, Vilnius University, Lithuania

## Introduction

Atrial fibrillation (AF) is the most common cardiac arrhythmia and a known risk factor for cerebrovascular stroke. AF and long standing hypertension may produce ischemic lesions leading to a progressive cognitive impairment. The impact of sole AF on cognitive impairment has not been properly evaluated. Patients with AF are more likely to suffer from increased prevalence of psychological distress and have significantly poorer quality of life.

## Aim

Our aim was to compare cognitive functions, quality of life, the prevalence of psychological distress and impulsiveness in elderly patients with AF without concomitant hypertension or with well – controlled hypertension and matched control group.

## Objectives

- To assess cognitive status using Mini Mental State Examination (MMSE);
- To determine psychological distress in forms of anxiety and depression using Hospital Anxiety and Depression Scale (HAD);
- To evaluate the quality of life using Heart related quality of life questionnaire (HeartQoL);
- To evaluate impulsiveness using Barratt Impulsiveness Scale (BIS-11);
- To compare MMSE, HAD, HeartQoL and BIS-11 scales' scores between AF and control groups.

## Methods

It is a prospective study performed in the Department of Cardiology at Vilnius University Hospital, Santariškių Klinikos from November 2014 to March 2015. The study included 60 patients aged  $\geq 55$  years, without hypertension (or with well - controlled hypertension) and without previous dementia. The participants were divided into two groups. 1. group: patients with  $\geq 5$  years history of AF (paroxysmal, persistent or permanent) and 2. group: a matched cohort of healthy control participants. Demographic and clinical characteristics were recorded such as gender, age, education in the both groups and additionally AF duration, anticoagulant therapy, blood INR levels and CHA2DS2-VASc score in AF group. Subjects underwent the following rating scales: Mini Mental State Examination (MMSE), Hospital Anxiety and Depression Scale (HAD), HeartQoL, Barratt Impulsiveness Scale (BIS-11). A score of 8 and above in HAD anxiety and/or depression subscales indicated anxiety and/or depression disorders. Statistical analysis of the data was performed using Microsoft Excel and Graph Prism 6 applications. The data was analyzed using an independent t-test. Whereas p value was less than 0.05, the data were considered as statistically significant.

## Results

In AF group there were 63.4% male (n = 19) and 36.6% female (n = 11) patients, control – 33.3% male (n = 10) and 66.7% female (n = 20) respectively. Age range was from 55 to 81 years in both groups, mean - 63.87 years ( $\pm 6.43$ ) in the AF group and 66.13 years ( $\pm 8.00$ ) in control. In AF group 23.33% had primary and general education, college – 23.33% and university – 53.33%; in control – 20%, 23.33% and 56.67% respectively.

In AF group median AF duration was 8.7 years ( $\pm 4.72$ ) (range 5-27 years). All patients were on anticoagulant therapy - mean CHA2DS2-VASc score was 2.53 ( $\pm 1.43$ ) (range 0-5). 76.67% (n = 23) had  $\geq 2$  score. 40% of patients INR level in therapeutic range, 36.67% lower and 3.33% higher than normal.

Mean score of MMSE was 27.57 ( $\pm 1.59$ ) in AF group and 29.5 ( $\pm 0.73$ ) in control group (p < 0.0001).

The average anxiety score was 8.93 ( $\pm 4.14$ ) in AF group and 6.13 ( $\pm 3.97$ ) in control group ( $p = 0.0097$ ). Anxiety disorders were observed in 20 (66.67%) patients in AF group and 8 (26.67%) in control ( $p = 0.0097$ ). Mean depression score was 5.83 ( $\pm 3.03$ ) in AF group and 5.23 ( $\pm 3.37$ ) in control group ( $p = 0.4712$ ).

HeartQoL mean score was 1.44 ( $\pm 0.65$ ) in AF group and 2.64 ( $\pm 0.35$ ) in control group ( $p < 0.0001$ ). Physical subscale mean scores were 1.42 ( $\pm 0.74$ ) vs 2.83 ( $\pm 0.18$ ) compared in groups ( $p < 0.0001$ ), emotional - 1.39 ( $\pm 0.67$ ) vs. 2.18 ( $\pm 1.02$ ),  $p < 0.0008$ .

Mean impulsiveness scores in AF and control groups were  $1.91 \pm 0.06$  vs.  $2.01 \pm 0.07$ ,  $p = 0.2896$ .

### Conclusions

Cognitive status is significantly lower in AF group. People with AF are more likely to develop anxiety disorder. In comparison to healthy subjects people with AF have worse quality of life. Regarding impulsiveness we found no significant difference between AF and healthy people.

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## TRANSCATHETER AORTIC VALVE IMPLANTATION IN PATIENTS WITH SEVERE AORTIC STENOSIS: INITIAL SINGLE CENTER EXPERIENCE WITH ONE YEAR CLINICAL OUTCOME

*Vilhelmas Bajoras*

*Supervisor of the abstract: Giedrius Davidavičius*

*Department of Cardiology, Vilnius University, Lithuania*

### Introduction

During the past several years Transcatheter aortic valve implantation (TAVI) has become a routine, guide recommended procedure for high surgical risk patients with severe aortic stenosis (1, 2). Furthermore the rising amount of articles about TAVI studies published every year proves a relevance of this medical issue (3, 4). However, the results of TAVI of Lithuania have not been reported yet.

## Aim

The aim of our study was to evaluate results of TAVI and compare it in balloon-expandable and self-expandable valves groups.

## Objectives

The primary endpoint of the study was death from any cause in hospital and at 12 months follow-up. The secondary endpoints were myocardial infarction, stroke, major bleeding, post procedural pacemaker placement, acute kidney injury in hospital and at 12 months follow-up.

## Methods

Between January 2009 and March 2014, a total of 71 consecutive high risk surgical patients with severe aortic stenosis were enrolled in this retrospective, single center, non-randomized study performed in Vilnius University Hospital Santariskiu Klinikos. Each patient was deliberated and evaluated by multi-specialist "Heart team". Depending on imaging tests results, every patient received a balloon-expandable (BE) (Edwards SAPIEN (Edwards Lifesciences, Irvine, California) or a self-expandable (SE) (Medtronic Corevalve or Medtronic Engager (Medtronic, Inc., Minneapolis, Minnesota) valve. A standard clinical and imaging examination of patients was performed before TAVI and post TAVI in hospital and at 12 months follow-up. Definitions of the endpoints were based on the Valve Academic Research Consortium-2 (2). Normal distribution was tested using the Kolmogorov-Smirnov test. Continuous variables with a normal distribution were compared using Student's t test and presented as mean  $\pm$  standard deviation (SD), otherwise, nonparametric Wilcoxon's signed-rank tests were used. Categorical variables were compared by using  $\chi^2$  or Fisher exact test and are presented as numbers or percentages. P value < 0.05 was considered significant. Statistical analysis was performed with SPSS version 20.0 (SPSS, Inc., Chicago, IL, USA).

## Results

Baseline clinical and procedural characteristics were similar between the BE and SE groups, except there were more males in SE group (17.1% vs. 43.3%;  $p = 0.015$ ). STS score was higher in the BE group ( $4.81 \pm 2.17$  vs.  $3.79 \pm 1.83$ ; 95% CI, 0.041-1.990;  $p = 0.027$ ). Hypertension (68.3% vs. 90%,  $p = 0.031$ ) and previous coronary artery bypass grafting (CABG) surgery (2.4% vs. 23.3%;  $p = 0.006$ ) more often occurred in the SE group. In-hospital mortality rate was 5.6%; 8.5% at follow up – and no significant difference between both groups was noticed (in-hospital: 7.3% vs. 3.3%;  $p = 0.472$ ; follow-up: 9.8% vs. 6.7%;  $p = 0.865$ ). Myocardial infarction (2.4% vs. 0.0%;  $p = 0.389$ ), stroke (0.0% vs. 3.3%;  $p = 0.239$ ), major bleeding (39.0% vs. 23.3%,  $p = 0.191$ ) and acute kidney injury (17.1% vs. 6.7%;  $p = 0.193$ ) rates were not statistically different in both groups. Nevertheless there were considerably more pacemaker implantations due to new atrioventricular block in SE group (7.3% vs. 40%;  $p = 0.001$ ). All events of secondary endpoints occurred during the period of hospitalization and none of them was recorded at follow-up.

## Conclusions

Our study demonstrates that there is no significant difference in mortality rate, myocardial infarction, stroke, major bleeding and acute kidney injury frequency between balloon-expandable and self-expandable valves groups in hospital and at 12 months follow-up. However, a pacemaker implantation because of new atrioventricular block is more frequent in self-expandable valves group. Recently published results of The CHOICE randomized clinical trial showed that the use of a balloon-expandable valve resulted in a greater rate of device success, although clinical results were similar in both groups (4).

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## **PUBLIC HEALTH SESSION**

# ASSESSMENT OF REHABILITATION TEAM WORKING CONDITIONS

*Karolis Kulakauskas, Erika Lingytė*

*Supervisor of the abstract: Raimondas Savickas, Joana Kriščiokaitytė*

*Department of Rehabilitation, LSMU, Lithuania*

## **Introduction**

The significance of the sphere of medical personnel working conditions becomes even more obvious. Despite that, in Lithuania there is too little attention is paid to it [1]. Consequently, nowadays a few of the important goals of the managers of medical care institutions are to encourage and motivate the personnel to retain their position, as emigration to foreign countries increases [2]. By cooperating with each other rehabilitation specialists form the group of people that carry out rehabilitation programme with an attempt to orient and enable the ill or disabled patients to seek the standard of their optimal physical, mental, emotional and social functioning [3]. The key objective of the rehabilitation group is patient's well-being. It is considered to be the objective of the whole group and each member separately [4,5]. This research aims to evaluate the working conditions of rehabilitation group members and determine how they correlate with ethical climate of the institution. The results will provide the data to determine and evaluate how working conditions influence satisfaction of the specialists with the job; also, after analyzing the results it is possible to compare the influence of motivation towards work among rehabilitation group members of public and proprietary divisions.

## **Aim**

This research aims to evaluate the working conditions of rehabilitation group members and determine how they correlate with ethical climate of the institution. The results will provide the data to determine and evaluate how working conditions influence satisfaction of the specialists with the job; also, after analyzing the results it is possible to compare the influence of motivation towards work among rehabilitation group members of public and proprietary divisions.

## **Objectives**

1. to determine whether the rehabilitation group members are satisfied with their working conditions.
  2. to assess how the socioeconomic factors influence the job.
  3. to assess the influence of ethical climate towards rehabilitation group members.
  4. to compare how motivation influences the rehabilitation group members in proprietary and public divisions.
- Subject: rehabilitation group members. Object: working conditions. The first hypothesis is that the motivation of rehabilitation group members is believed to have a positive effect on work. The second hypothesis is that the working conditions of rehabilitation group members at proprietary division are better rather than public division.

## **Methods**

The research is there are 408 respondents, 141 of them work at proprietary division, and the rest 267 respondents, that are the specialists in rehabilitation, work at public division. Methods. The questionnaire consisted of 45 questions. The first part was based on The Questionnaire of Medical Personnel's Working Conditions and Job Satisfaction, and the second formed according to Victor and Cullen's organizational ethical climate research instrument assessed by Liker's scale. Statistical analysis. SPSS 19 for Windows programme was used to carry out the statistical analysis. Data propriety of the factor analysis was evaluated based on Kaiser-Meyer-Olkin (KMO) adequacy rate. The characteristics of the research conditions are factorised applying the method of principal factors selection using Varimax turn and Kaiser's normalisation. Correlations under 0.45 were not estimated. The results were rearranged into quartiles. Chi-square test method was applied in order to carry out the analysis of connection among the variables. Statistical differences were considered to be reliable if the bias is up to 5 per cent ( $p < 0.05$ ).

## Results

The evaluation of working conditions of the rehabilitation team members in both private and public sectors appeared to be moderately good ( $p < 0,05$ ).

## Conclusions

1. Job satisfaction of the rehabilitation team members is moderately good ( $p < 0,05$ ). It was determined that there are several most significant factors of the job satisfaction: good working conditions, relationships with colleagues, possibility to improve and multiple knowledge appliances at work. Strong correlation between evaluation of the working conditions and job satisfaction was identified ( $p < 0,01$ ); statistically LSMUL KK respondents consider job satisfaction being more significant than other medical institutions. 2. Rehabilitation team members consider that the greatest influence of socioeconomic factors towards working productivity is gained from bonus incentives, possibilities to have qualification courses, and tolerant relationships with the manager ( $p < 0,05$ ). The majority of the respondents evaluated the economic factors being moderately significant. 3. Statistically, it was estimated that ethical climate had the most significant influence on the respondents working in the 3rd level hospitals ( $p < 0,01$ ). The main aspects that influenced ethical climate were determined: inner competition, different salary, and different working conditions. 4. The influence of motivation towards work was statistically significantly greater ( $p < 0,01$ ) for the respondents in the private than public sector. Statistically there are several most significant factors that influence rehabilitation team member motivation: higher salary and evaluation of working conditions. It was determined that the motivation of Kaunas rehabilitation team members is statistically stronger in comparison to rehabilitation team members in Vilnius. The first hypothesis is supported completely, and the second hypothesis is partially supported.

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## COUNSELLING PATIENTS ON THEIR SEXUALITY: COMPETENCY BARRIERS OF HEALTH CARE PROFESSIONALS

*Rūta Paškevičiūtė, Paulius Kondrotas*

*Supervisor of the abstract: Aurelija Blaževičienė*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Sexuality is declared as dynamic and integrated as well as indispensable element of human life by World Health Organization (WHO) in 2002. Chronic medical conditions such as angina pectoris (AP), heart failure (HF), diabetes, chronic obstructive pulmonary disease (COPD), myocardial infarction (MI) or multiple sclerosis (MS), as well as severe gynaecological, gastroenterological, urologic surgeries, organ transplantation or spinal cord injuries (SCI) lead to

different levels of impairment in sexual functioning both physically and psychologically. Thereby, patients need sexual counseling in order to maintain sexual function. Sexual counselling is therefore indispensable. Lack of education, knowledge, skills and awareness as well as barriers both from health care professionals and patients hinder discussing sexuality. Literature describes that doctors and nurses rarely address sexual issues while speaking with patient. Possible reasons for insufficient sexual counselling are personal, institutional and patient-related barriers.

### **Aim**

To evaluate the opinion of health care professionals about their confidence in consulting patients who have chronic medical conditions about their sexuality and to analyze factors related to the quality of counselling.

### **Objectives**

1. To investigate the comfort level among health care professionals in counseling patients about sexuality.
2. To determine when (with which chronic conditions) sexual counseling is the most important (in health care professionals' opinion).
3. To identify the main barriers that prevent health care professionals to address sexuality with patients.

### **Methods**

Quantitative research using anonymous survey with specifically adapted questionnaire was performed. 131 participants formed the sample of the study: 72 students of nursing and 59 doctors and resident doctors. Respondents were asked to answer 14 anonymous questions that were divided into sections: the importance of addressing sexual problems with chronic patients; factors limiting medical personnel to discuss questions about sexuality with chronic patients; sociodemographic data. The attitude of respondents was evaluated by analyzing their answers and ranking their choices by importance. In order to find out whether particular factors have an influence on respondents' opinion about necessity of consultations about sexuality, respondents were divided into groups according to their age, profession and work experience. Results of the survey were analyzed using Chi ( $\chi^2$ ) criterion,  $p < 0,05$  was selected as level of statistical significance. Results are submitted in averages, standard deviations or percentages.

### **Results**

131 respondents participated in the survey: 45,04% (59) doctors and resident doctors and 54,96% (72) nurses. The mean age was  $35,30 \pm 8,632$  years. The mean work experience  $12,61 \pm 9,869$  years. Results of survey revealed that health care professionals do not feel ready to consult patients about sexuality after breast or uterus removal (71,1%), hypertension (68,4%), diabetes (67,2%), HF (64,7%). Three thirds of the respondents find themselves ready or completely ready to consult patients with SCI (47,1%), MS (45,3%), after urologic surgeries (45,4%). Survey disclosed that respondents do not consider sexual counselling as a priority. Somatic conditions that always require sexual counseling: hypertension (indicated by 19,2% doctors, 16,9% nurses), COPD (18,8% nurses, 21,6% doctors), MI (12,1% nurses, 13,2% doctors), MI (10,8% nurses, 11,5% of doctors), HF (10,8% nurses, 11,5% doctors). All respondents noted that sexual counseling is irrelevant after removal of uterus and urologic surgeries. Factors preventing from sexual counseling: patients being embarrassed to talk about sexual issues (64,4%), patients not reporting sexual problems (42,0%), patients not demanding information on sexual issues (26,7%), health care specialists never address sexuality while talking to patients (29,8%). The least significant factor was the embarrassment of health care professionals (7,63%).

### **Conclusions**

1. Health care professionals confirm the importance of patients' sexual health but often do not feel ready to address sexuality with patients after breast or uterus removal, with hypertension, diabetes, heart failure.
2. Chronic conditions that requires counseling about sexuality the most are hypertension, myocardial infarction, chronic obstructive pulmonary disease, heart failure and multiple sclerosis. Health care professionals claim sexual counseling to be not necessary after the removal of uterus or urologic surgeries.

3. The most restrictive factors about consultations on sexuality are related to patients: embarrassment to discuss this topic and failure to reveal sexuality problems to health care specialists.

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## ELECTRONIC CIGARETTES HELP PEOPLE QUIT TRADITIONAL SMOKING?

*Daniel Piątek, Kamila Bąk, Emilia Migryt, Krzysztof Jankowski, Joanna Szydełko*

*Supervisor of the abstract: Anna Boguszewska-Czubarra*

*Medical University of Lublin, Poland*

#### Introduction

In the current time young people find e-cigarettes as an alternative for traditional cigarettes. In general new invention do not contain tobacco, although it do use nicotine from tobacco plants. Definite advantage of e-cigarette is lack of smoke, but it produces some kind of aerosol. The health benefits and risks of e-smoking are still unfortunately unclear. E-cigs users claim that electronic device is completely harmless, but scientists stay restraint. Nonetheless, there are experiments revealing that aerosols and flavorings can damage lung cells by creating harmful free radicals and inflammation in lung tissue. Furthermore, the inhaled vapors contain heavy metals and other possible nanoparticles of carcinogens, which can reach into lung tissue, cell systems, and blood stream. It causes locally oxidative stress and contributes to cell damage.

#### Aim

The purpose of this research was to assess if e-cigarettes users can find them way to give up traditional smoking and to estimate if these devices could be consider as element of therapy against nicotine addiction.

#### Objectives

1. Known affection of e-cigarettes on human organism.
2. Do e-cigarettes have role in smoking cessation?
3. How many people find e-cigs way to start or give up traditional smoking?
4. Do e-cigarettes have chance to stay part of medical treatment therapy against nicotine addiction?

#### Methods

Research included 204 e-smokers (198 present smokers and 6-ex smokers) at the age of 18-60 years. The research tool was questionnaire, which was constructed and used in order to collect research data. We got such number of forms fulfilled by interviewees thanks to publishing them on popular facebook fanpages corresponding with e-cigarettes subject. Gathering surveys period lasted one month from 1st to 31th of July 2014 more specifically. Questionnaire included questions among others about giving up smoking attempts, main incentive to choose e-cigarettes and onset of addiction to nicotine. To contemplate potential nicotine-addiction-therapy with e-cigs we had taken into consideration latest literature and articles going back to 2009.

## Results

Among respondents there were 190 people at the age of 18-26 years, three at 26-40 years and five between 40 and 60 years. The number of people with secondary education reached 150, with basic education 24 and with high education 30. The largest part of interviewees lived in the city (152) and only 52 came from different villages. As we observed a lot of questionnaires tried to quit traditional smoking at least once in their lives, but only 6 stopped their nicotine addiction definitely. Only 9% interviewees found e-cigarettes as their onset of addiction to nicotine. 91% changed their traditional cigarettes on e-cigs. Furthermore especially those people, who on average smoked 5-10 cigarettes a day were more likely to choose e-cigarettes with high content of nicotine. Choosing higher contents of nicotine in liquid by traditional smokers was evident trend.

## Conclusions

E-cigarettes are perceived as risk factor and predispose to nicotine addiction, but such option is less often observed. Conversely scientists find e-cigs way to give up smoking traditional and more harmful cigarettes. However, if the patient perceives that the e-cig is helping them to stay off cigarettes and is not reporting any health problems likely attributable to the e-cig, then the focus should be on staying smoke-free rather than e-cig free. Therefore it is very important to give more attention and to know accurate influence of e-cigs on our organism before we could take into consideration applying it in nicotine addiction treatment.

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# EVALUATION OF HAND HYGIENE PREPARATION IN PEDIATRIC ONCOLOGY AND HEMATOLOGY DEPARTMENT IN YEAR 2014 - 2015

*Arnas Urbonavičius, Rūta Ratytė, Rūta Miškinytė*  
*Supervisor of the abstract: Dovilė Grinkevičiūtė*  
*Lithuanian University of Health Sciences, Lithuania*

## **Introduction**

Thousands of people die every day around the world from infections acquired while receiving health care. Hands are the main pathways of germ transmission during health care. Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and to prevent health care - associated infections. [1] Although promotion of safe hand hygiene is one of the most cost-effective means of preventing infectious diseases, investment in hand hygiene is still low in the health sector. [2] Improved hand hygiene can result in reduction of infectious diseases, gastrointestinal illnesses and reduction in respiratory illnesses. [3]

## **Aim**

To evaluate the compliance of hand hygiene preparation in Lithuanian University of Health Sciences hospital Kaunas clinic of Pediatric Oncology and Hematology department in year 2014 – 2015.

## **Objectives**

1. Evaluate how personnel follow hand hygiene preparation requirements.
2. Evaluate the preference for the different hand hygiene preparation means.
3. Evaluate correlation between hand hygiene preparation and varying shifts during the day.

## **Methods**

Using a form created by the International Nosocomial Infection Control Consortium (INICC), observations were conducted during the morning (8:00 to 12:00 am), afternoon (12:00 to 16:00 pm) and evening shifts (18:00 to 21:00 pm). The “shadow study” type was performed, meaning that personnel were observed being unaware of the performed task. Observations lasted 60 minutes once a week per each shift. Each time the form was filled with the following data: date – date when the observation was made; time - hour when the observation was made; health care professional - physician (P), nurse (N), ancillary staff (AS); sex - male (M) or female (F); type of contact – non invasive (any contact that does not violate natural defense barriers, such as skin and mucosa), invasive (any contact that violates natural defense barriers, such as skin and mucosa); previous hand hygiene (HH) - if the observed personnel washed their hands immediately before procedure or if they did not; used soap or hand-rub - if so, specify which (common, Alcohol); used towel - if so, specify which (Cloth, Paper). The results were analyzed using Microsoft Office Excel 2010. The descriptive statistics were applied. Data is presented in percentages.

## **Results**

Data analysis was completed with the goal to provide a detailed evaluation of personnel with relation to their hand hygiene preparation. Different situations were included in the analysis where hand hygiene was appropriate and was not, and how it was affected depending on the time of day. The data showed that only 38.64% of personnel exhibited proper hand hygiene. Of those personnel, the majority (66.9%) chose to use only alcohol for hand hygiene, versus 24.7% for both non-medicated soap and alcohol, and 8.4% choosing only non-medicated soap. There was little variation in the percentage of personnel that followed proper hand hygiene during the afternoon and evening shifts, with 43.45% for the afternoon, and 40.07% for the evening. However, the personnel during the morning shifts were observed to be following hand hygiene preparations only 16.48% of the time.

## Conclusions

According to the data, less than half of all personnel properly follow hand hygiene requirements. After evaluation of the data, it was clear that most personnel prefer to use only alcohol as a preferred mean for hand hygiene preparation. Upon analysis of the collected data, it was determined that the highest percentage of personnel correctly followed hand hygiene preparation during the afternoon shift.

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## HIV PREVALENCE AMONG KAUNAS CLINICAL HOSPITAL'S PATIENTS' AND THEIR KNOWLEDGE ON HIV INFECTION

*Justas Grušauskas, Jandra Galkauskaitė, Gailė Damulevičiūtė, Vytautas Griška*  
*Supervisor of the abstract: Daiva Vėlyvytė, Monika Kuliešė*  
*Department of Infectious Diseases, LSMU, Lithuania*

### Introduction

Measures of HIV/AIDS knowledge and risk perception are important because they are often linked to behavioral change both in theory and in practice. Previous research by other authors shows that respondents were very knowledgeable about the major modes of transmission, but they still had misconceptions about the likelihood of transmission through casual contact. Additionally, studies were conducted on physicians' and nurses' knowledge about HIV/AIDS. Our study concentrates specifically on a population of patients treated in Kaunas Clinical hospital.

### Aim

To evaluate Kaunas Clinical Hospital's patients' knowledge on HIV infection and to measure the prevalence of HIV infection amongst them.

### Objectives

1. To perform rapid HIV antibodies detection blood tests on patients in Kaunas Clinical Hospital's therapeutic and surgical wards and to evaluate the prevalence of the infection.
2. To determine the patients' knowledge on the routes of infection and the presentation of the disease.
3. To evaluate the patient's knowledge on the risk factors and prevention methods of the disease.
4. To assess the availability of the information on HIV infection to the patients.

### Methods

A cross-sectional study was performed between 2014-12-01 and 2015-02-20. 470 questionnaires were distributed in therapeutic and surgical wards of Kaunas Clinical Hospital, 360 of those were filled out (response rate = 76.6%). 210 women and 150 men between 18 and 89 years were surveyed (average - 58 years). The questionnaire consisted of 11 questions (mostly closed-type) on HIV infection, the routes of infection, prevention methods and risk factors. Afterwards, blood samples were taken and rapid HIV antibodies detection tests were performed. Data analysis was performed using SPSS.

## Results

38.1% claimed they don't need additional information on HIV, due to sufficient knowledge, 13.6% think that it's irrelevant because they won't get infected. Only 21.9% knew the period of time between getting infected and developing AIDS symptoms. 80.2% knew that a person becomes infectious during the first weeks-months after getting infected and 65.0% were correct that AIDS treatment can prolong life and reduce symptoms. Only 4.4% see themselves at high risk for HIV infection. The majority of information on HIV is obtained through media, internet (87.1%), only 20.8% of the respondents received information from doctors and 19.1% - from scientific literature. 98.9% correctly indicated sex as an HIV transmission route, 92.8% - i/v drug injections, 81.9% - vertical transmission during pregnancy and 81.3% - kissing when mouth sores are present. 81.3% also chose tattooing, piercing. 46.7% incorrectly believe that sharing household objects (toilet, dishes) with an infected person can get them infected, 1 in 4 think that even being in the same room (26.5%) or shaking a hand (24.5%) can do that. 32.6% falsely believe that insects can transmit HIV. 96.9% correctly selected drug users as an HIV risk group, 95.8% - people with multiple sex partners, 82.5% - MSM and 63.8% - WSW. 56.0% incorrectly indicated blood donors, 46.2% - alcoholics, 40.9% - sailors, 21.4% - smokers, 20.9% - soldiers. Most people indicated condoms as a prevention method. Only 1 person (0.3%) was HIV-positive.

## Conclusions

1. The prevalence of HIV infection in Kaunas Clinical hospital among 360 tested patients was 0.3%.
2. Patients tend to believe that HIV spreads through more routes and causes symptoms sooner than it actually does.
3. The respondents indicate more risk groups than are at actual risk and only few know prevention methods other than condoms.
4. The largest part of information is provided by media and internet and an insufficient amount by the doctors.

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## IT'S EASIER TO GET RID OF OLD REFRIGERATOR THAN DRUGS, THAT IS – THE WAY OF UTILIZATION OF SELL-BY DATE MEDICINES

*Kamila Bąk, Daniel Piątek, Diana Bajerczak, Joanna Szydełko, Magdalena Amarowicz*

*Supervisor of the abstract: Anna Boguszewska-Czubarą*

*Medical Student's Association, Department of Clinical Chemistry, Medical University of Lublin, Polska*

## Introduction

Drugs which are past their sell-by date or worn out threaten not only environment, but also our health and life, and problem with their utilization is still relevant.

### **Aim**

The survey was performed in order to check the awareness of people living in Lublin (Poland) of appropriate methods of worn drug utilization, as well as their proper storage. Moreover, the aim of this paper was to assess the state of participants' stage of knowledge on influence of drugs utilized in inappropriate way on the environment.

### **Objectives**

1. What is the awareness of people of drug utilization.
2. What is the knowledge of people about the influence of drugs on human health and environment.

### **Methods**

The study was conducted among group of 50 inhabitants of Lublin who, do not represent medical education. They were chosen randomly and they were asked to fill out the author's questionnaire.

### **Results**

Group of research included 32 (64%) women and 18 (36%) men. The biggest group of the responders was from 20 to 30 years old (40, 80%) with higher education – but not medical one (25,50%). Most responders admitted that they throw out drugs with the rubbish (24,49%) or to the sink/toilet (7,14%). The analysis also revealed that in many pharmacies there is no special container for drugs (11,22%). Moreover, responders noticed that the main reason of their awareness was lack of information about drugs' utilization (34,69%). According to 28 (57%) responders drugs which are led into the environment threat not only human, but also animals. 25% (12) participants do not check the expiration date and 18% (9) do not pay attention on consistency before taking the medicine.

### **Conclusions**

Not only worn or past their sell-by date drugs, but also those which recycled incorrectly (by penetration into environment) pose a threat to human. The awareness of this fact is still unsatisfying, so it's crucial to improve it by for example educational actions.

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## **THE ASSESSMENT OF DOCTORS' JOB SATISFACTION RATE AT KAUNAS CLINICAL HOSPITAL**

*Sandra Čaraitė, Karolis Kulakauskas, Gabrielė Šeputytė*

*Supervisor of the abstract: Renata Alenskaitė – Petraškienė, Joana Kriščiokaitytė*

*Lithuanian University of Health Sciences, Lithuania*

### **Introduction**

Job satisfaction of a doctor is one of the main conditions needed in order to apply changes and improve the quality of healthcare in healthcare system organisations [1,2]. The attitude towards work, responsibility, initiative, personal values and feelings of the doctor has an influence on the quality of service and patient satisfaction [3,4,5]. Good emotional state of the personnel may ensure excellent work quality [6,7,8]. The research on job satisfaction is very important in order to make a successful working plan, find out the attitude of employees towards work, assess their needs and determine present failures. The main attempt during this research is to reveal the most relevant problems of the personnel which lead to the improvement of job satisfaction [9].

## **Aim**

The objective is to assess doctors that work in Kaunas Clinical Hospital job satisfaction rate and determine the factors having influence on it.

## **Objectives**

1. To determine the level of doctors job satisfaction at Kaunas Clinical Hospital. 2. To reveal the factors that influence doctors' job satisfaction level. 3. To assess how working conditions affect job satisfaction of the doctors. 4. To determine the possibilities of qualification improvement and how it is related with the job satisfaction rate.

## **Methods**

Doctors and senior residents working in Kaunas Clinical Hospital were interviewed during the research (11.10.2012 – 01.03.2013). 150 questionnaires were given to them and 144 questionnaires were brought back (reply rate is 96 per cent). Respondents were given anonymous 42-question questionnaire based on the job satisfaction questionnaire of Minnesota and the assessment tool of medical personnel's working conditions. Likert's scale has been used for the assessment of the answers. Double assessment was made for both research tools. Statistical analyzes was performed using SPSS ver.19 software. For qualitative data analysis we used Chi-square parameter and for quantitative - Student parameter. Non parametric Mann-Whitney parameter was used for data comparisons. Along with that we performed logistic regression analysis to identify independent factors leading to a different outcome. For verification of statistical hypotheses, the significance level of ( $p < 0.05$ ) was chosen.

## **Results**

The analysis of doctors who work in Kaunas Clinical Hospital job satisfaction was made. The job satisfaction level of both physicians and residents was determined. Residents had higher job satisfaction level (4.5 points) than physicians who were working for more than ten years (3.9 points). The overall satisfaction level of the respondents was rated very high (4.55 points). A strong statistically significant correlation was determined between the job satisfaction of physicians and residents and their direct relationship with their employer ( $r = 0.78$ ,  $p < 0.001$ ). The analysis of doctors who work in Kaunas Clinical Hospital job satisfaction level showed that respondents' results split into two groups according to the gender. Men (4,9 points) showed greater job satisfaction than women (4,2 points). The analysis of doctors job satisfaction factors showed a medium and a strong statistically significant correlation between job satisfaction of physicians and independence level ( $r = 0.81$ ), opportunities to achieve higher qualification ( $r = 0.69$ ), and relationship with their employer ( $r = 0.67$ ). It was concluded that doctors' most significant factor for job satisfaction was using their diverse knowledge at work (98.7 percent). The residents concluded that the most significant factor for their job satisfaction was independence (97.3 percent). The analysis showed that working conditions had direct influence on the job satisfaction level. It was determined a medium statistically significant correlation between different salary ( $r = 0,55$ ), different working conditions ( $r = 0.71$ ), and heavy workload ( $r = 0,64$ ). The residents concluded that the most significant factor for them was the competition among them ( $r = 0,63$ ) and the heavy workload ( $r = 0,57$ ). The analysis of the doctors job satisfaction in relation with the opportunities to achieve higher qualification showed that the most influence on residents were opportunities to achieve higher qualification ( $r = 0,49$ ,  $p < 0,001$ ) and opportunities to create a career ( $r = 0,71$ ,  $p < 0,001$ ). The most important aspect for doctors who are working more than ten years are higher qualifications ( $r = 0,42$ ,  $p < 0,001$ ), and self- development ( $r = 0,83$ ,  $p < 0,001$ ). It was determined a strong statistically significant correlation between opportunities to achieve higher qualifications ( $r = 0,76$ ,  $p < 0,001$ ) and the job satisfaction assessment rate( $r = 0,59$ ,  $p < 0,001$ ). It was also determined that motivation of doctor who are working more ten years is higher (91,2 per cent), than the one of residents (64,7 per cent).

## **Conclusions**

1. The job satisfaction level of doctors and residents working in Kaunas Clinical Hospital is high. It was determined that men show greater job satisfaction than women among doctors. Doctors – residents indicated higher job satisfaction level than the ones who work in the Clinical Hospital over ten years. 2. The most significant factors that influence residents' job satisfaction are the possibility for self-expression at work and opportunities to achieve higher

qualification. 3. The assessment of doctors' and residents' working conditions had direct influence to the job satisfaction level. 4. There is a strong relation between the possibilities to achieve higher qualifications and the job satisfaction assessment rate of the doctors.

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## **SURGERY I SESSION**

# EVALUATION OF INTRA-ABDOMINAL FREE GAS AND C-REACTIVE PROTEIN CHANGES AFTER OPEN COLORECTAL SURGERY

Rokas Linkevičius, Karolis Černauskis

Supervisor of the abstract: Tadas Latkauskas

Lithuanian University of Health Sciences, Department of Surgery, Lithuania

## Introduction

An erect chest radiograph for sub-diafragmic free gas and routine blood samples are used in the clinical practice to track the patient's status after colorectal surgery. With this prospective study we set out to evaluate the IAFG (sub-diafragmic region in millimetres) and CRP (in grams per litre) values and to make some preliminary conclusions about the usefulness of these methods in postoperative period after open colorectal surgery.

## Aim

Evaluate the intra-abdominal free gas and C-reactive protein changes after open colorectal surgery.

## Objectives

1. Evaluate the intra-abdominal free gas changes in the sub-diafragmic region (in millimetres) during 3rd and 6th day after open colorectal surgery (via laparotomy).
2. Evaluate the changes of C-reactive protein (in grams per litre) during the 1st, 3rd and 6th day after open colorectal surgery.

## Methods

Data of 30 patients, who had elective surgery were analyzed. Open colorectal surgery (via laparotomy) was performed to each of them with anastomosis after colectomy. Biochemical blood sample was taken for every patient on the 1st day after surgery. During the 3rd and 6th days after surgery, erect chest radiograph and biochemical blood samples were made also. Post-operative period with no complications and with complications was evaluated. The data analysis was processed by SPSS 22.0 statistical analyze packet using T-test and X2 test. The differences were evaluated as statistically significant when  $p < 0.05$ .

## Results

1. 30 patients participated in the study. 14 men (46.7%), 16 women (53.3%), age average  $69.2 \pm 9.52$  years, 25 had successful post-operative period with no complications ( $p = 0.001$ ), 3 had pneumonia, 2 had anastomotic leakage. IAFG were suspected for 7 patients without postoperative complications during 3rd and 6th postoperative day, gas average values were  $7 \pm 4.14$  mm. For 2 patients with anastomotic leakage, IAFG average value was  $15 \pm 1.42$  mm during 3rd day after surgery ( $p > 0.05$ ).
2. The changes of CRP for patients without postoperative complications after surgery were  $102.43 \pm 10.39$  g/l,  $97.99 \pm 21.82$  g/l and  $51.33 \pm 27.92$  g/l on the 1st, 3rd and 6th day respectively. When pneumonia was diagnosed CRP value on the 1st day after surgery was  $105.13 \pm 66.73$  g/l, 3rd -  $147.38 \pm 45.6$  g/l, 6th -  $163.56 \pm 61.21$  g/l. After diagnosis of anastomotic leakage, CRP values on the 1st day after surgery were  $98.34$  g/l, 3rd -  $157.50$  g/l, 6th -  $267.25$  g/l. There are no statistically significant difference on CRP values between complications and no complications group during post-operative period on the 1st day after surgery ( $p > 0.05$ ). On 3rd and 6th day after surgery CRP values are statistically significantly different between complications and no complications groups ( $p = 0.041$ ).

## Conclusions

1. IAFG can be suspected on 3rd and 6th day after surgery either there was anastomotic leakage or was not. Higher IAFG values were found in anastomotic leakage group, but statistical significance could't be revealed cause of short sample size ( $p > 0.05$ ).
2. There are no statistically significant difference on CRP values between complications and no complications group

during post-operative period on the 1st day after surgery ( $p > 0.05$ ). On 3rd and 6th day after surgery CRP values are statistically significantly different between complications and no complications groups ( $p = 0.041$ ).

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## LIVER RESECTION FOR THE TREATMENT OF HEPATOCELLULAR CARCINOMA: COMPARISON OF OUTCOMES IN PATIENTS WITHIN AND BEYOND BCLC ALGORITHM CRITERIA

*Mantas Kievišas, Lina Kievišienė, Ingrida Leonavičiūtė*

*Supervisor of the abstract: Dr. Tomas Vanagas*

*Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Department of Surgery, Lithuania*

### Introduction

Hepatocellular carcinoma (HCC) is one of the leading causes of cancer-related deaths worldwide, being the fifth most common cancer and the third most important cause of cancer-related mortality in men[3]. Hepatic resection is widely accepted as the choice of treatment for HCC. However, if the patient is not carefully selected for liver resection, high rates of in-hospital mortality, surgery-associated complications and low survival rates are common. Over the past decade, strict clinical practice guidelines for staging and treatment of HCC were settled. Clinical guidelines for treatment of HCC are mainly based on the Barcelona Clinic Liver Cancer (BCLC) algorithm.

### Aim

To analyze the outcomes in HCC patients treated by liver resection within and beyond BCLC algorithm criteria in the hospital of Lithuanian University of Health Sciences (LSMU).

## Objectives

1. To analyze overall outcomes of the HCC patients after liver resection.
2. To compare outcome data in HCC patients within and beyond BCLC algorithm criteria.

## Methods

This was a retrospective, cross-sectional study. Forty patients who received liver resection for HCC in the Hospital of LSMU from November 2000 till March 2015 were included into the study. Patients were divided into two groups: within BCLC algorithm criteria (group A) and beyond BCLC algorithm criteria (group B). BCLC algorithm criteria were defined as solitary tumor 5 cm or less, normal bilirubin, no evidence of portal hypertension and the absence of macroscopic vascular invasion or extrahepatic metastasis. We analyzed and compared the baseline characteristics (age, mean size of the largest tumor), length of postoperative hospital stay (LoS), in-hospital mortality, postoperative morbidity, median survival (MS), overall survival (OS) and disease free survival (DFS). OS and DFS were assessed 6 months, 1, 2 and 3 years after surgery. Patients who died in early postoperative period were included in the survival analysis. Statistical analysis was performed using SPSS 22.0 software package. Normality of data was checked by the Shapiro-Wilk test. Categorical variables were compared using chi-square ( $\chi^2$ ) and continuous variables using the Student's t-test. Quantitative data were expressed as mean and standard deviation. Survival analysis was performed by the Kaplan-Meier survival method and compared using the log-rank test. P values of less than 0.05 were considered significant. The study was approved by Ethics committee of LSMU (approval No. BEC-MF-434).

## Results

There were 29 (72.5%) male and 11 (27.5%) female patients. Mean age was 66.2 (9.3) years. Mean size of the largest tumor was 7.1 (4.8) cm. LoS after surgery was 12.9 (10.5) days. In-hospital mortality rate was 27.5% (N = 11) and the most common cause of death was hepatorenal syndrome (N = 8). Postoperative morbidity rate was 47.5% (N = 19). MS time was 32.9 months. OS rates after 6 months, 1-, 2-, and 3-year were 64.9%, 61.1%, 55.9% and 33.3%, respectively. DFS rates after 6 months, 1-, 2-, and 3-year were 59.5%, 50%, 44.1% and 26.7%, respectively. There were 14 patients in group A and 26 in group B. Mean age of patients in group A was 67.3 (8.2) years, in group B – 65.5 (9.9) years (P = 0.577). The mean size of the largest tumor was significantly bigger in group B (9.2 (4.7) vs 3.2 (1.3) cm, P0.05). The DFS after 6 months, 1-, 2-, and 3-year in A and B groups were 72.7% vs 53.8%, 70% vs 42.3%, 60% vs 37.5% and 37.5% vs 22.7%, respectively (P > 0.05).

## Conclusions

1. Almost one third of the HCC patients treated by liver resection died in hospital at postoperative period and the main cause of in-hospital mortality was hepatorenal syndrome. Nearly half of the patients suffered from surgery-associated complications. Median survival time after surgery was approximately 3 years.
2. Patients within BCLC algorithm criteria had significantly lower rate of in-hospital mortality, fewer number of surgery-associated complications and better median survival time, compared with those beyond BCLC algorithm criteria.

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## **NEGATIVE PRESSURE THERAPY IN THE MANAGEMENT OF COMPLICATED INTRA-ABDOMINAL INFECTION**

*Ilze Barone, Krista Mize*

*Supervisor of the abstract: Haralds Plaudis*

*Department of Surgery, Riga Stradins University, Latvia*

### **Introduction**

Despite advances in diagnostics, surgery and antibacterial therapy, mortality associated with complicated intra-abdominal infection remains high. Negative pressure therapy (NPT) has proved to be lifesaving in the management of critically ill patients requiring repeated operations to achieve source control.

### **Aim**

To assess the effectivity of negative pressure therapy in patients with complicated intra-abdominal infection (CIAI).

### **Objectives**

- 1) To include patients with CIAI requiring NPT to achieve source control.
- 2) To assess severity of the disease and evaluate the effect of NPT.
- 3) To perform statistical processing of the data using statistical programs **SPSS 21.0, Microsoft Excel 2010**.

### **Methods**

Patients hospitalized in Riga East Clinical University Hospital due to CIAI treated with open abdomen using abdominal NPT were retrospectively included from December 2010 till December 2014. Only KCI® ABThera™ NPT systems were used. Acute Physiology and Chronic Health Evaluation II (APACHE II) score on admission, daily sequential organ failure assessment (SOFA) score and Mannheim peritonitis index (MPI) were calculated for severity definition. The frequency of the NPT system changes, daily amount of aspirated fluid effluent and the time of abdominal closure were assessed. The overall hospital and ICU stay, complication rate and outcomes were analysed.

### **Results**

In total 44 patients were included. In 7 patients CIAI was caused by perforation in upper gastrointestinal tract. In 22 patients it was caused by perforation in lower gastrointestinal tract (in 8 patients due to appendicitis, in 8 patients due to diverticulitis, in 6 patients due to intestinal tumor). In 9 patients CIAI developed due to intestinal obstruction. In 2 patients it was caused by penetrating stabbing wound. In 4 patients CIAI was caused by other factors. The median age of the patients was 59.6 years (range, 21 to 89), median APACHE II score was 16.6 points (range, 6 to 32) and median MPI was 26.7 points (range, 5 to 40) indicating a prognostic mortality risk of 60%. Sepsis developed in all patients, in 33 it was severe and 25 suffered septic shock. Median of 2 NPT system changes were needed and abdominal closure was feasible median on eight postoperative day without necessity for repeated laparotomy. Median daily aspirated fluid effluent was 614 ml (range, 183 to 1820). Median plasma C-reactive protein levels and SOFA points before application of NPT were 251mg/L and 6.7 points, dropped to 93 mg/L and 3 points after abdominal closure, respectively. Bleeding from the retroperitoneal space during the NPT was observed in 2 patients, intestinal fistulas developed in 2, which were successfully managed conservatively with NPT. Wound infection after abdominal closure complicated clinical course in 5 patients.

The overall ICU and hospital stay were 14.9 (range, 5 to 35) days and 26.6 (range, 9 to 87) days, respectively. 9 patients died, contributing to the overall mortality of 20.4%. In 8 (88.8%) patients death was associated with the development of septic shock.

## Conclusions

Abdominal NPT could be a highly promising method in the management of patients with CIAI that is associated with severe sepsis and septic shock.

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## RADIOFREQUENCY ABLATION COMPARED TO LIVER RESECTION IN HEPATOCELLULAR CARCINOMA BEYOND RESECTION CRITERIA

*Mantas Kievišas, Lina Kievišienė, Ingrida Leonavičiūtė*

*Supervisor of the abstract: Dr. Tomas Vanagas*

*Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Department of Surgery, Lithuania*

### Introduction

Hepatocellular carcinoma (HCC) is one of the most common malignancies worldwide. For candidate patients liver transplantation is the best treatment for HCC as it removes both the tumor and the cirrhotic background liver. However, its use is limited by lack of donor organ supply. For this reason, liver resection (LR) is traditionally seen as the next best treatment option for patients with HCC. Unfortunately, the majority of patients with HCC are not eligible for liver resection because of tumor extent or underlying liver dysfunction. As a result multiple local treatments such as radiofrequency ablation (RFA) have been developed to treat HCC. RFA has been increasingly used as a second-line alternative to surgery. However, the optimal treatment for HCC beyond resection criteria remains insufficiently established.

### Aim

To compare the outcomes in patients with HCC beyond Barcelona Clinic Liver Cancer (BCLC) staging and liver resection criteria treated with either RFA or LR in the hospital of Lithuanian University of Health Sciences (LSMU).

### Objectives

1. To analyze baseline characteristics of the patients with HCC beyond BCLC liver resection criteria treated with RFA or LR.
2. To compare postoperative morbidity, mortality, recurrence rates and length of hospital stay of the patients with HCC beyond BCLC liver resection criteria after treatment with RFA or LR.
3. To compare survival rates of the patients with HCC beyond BCLC liver resection criteria after treatment with RFA or LR.

## Methods

This was a retrospective, cross-sectional study. Forty eight patients with HCC beyond BCLC liver resection criteria received either LR (N = 26) or RFA (N = 22) as a treatment from November 2000 till March 2015 in the Hospital of LSMU were included in this study. BCLC liver resection criteria were defined as solitary tumor  $\leq 5$  cm, normal bilirubin, no evidence of portal hypertension and the absence of macroscopic vascular invasion or extrahepatic metastasis. We analyzed the baseline characteristics (age, gender, mean size of the largest tumor, Child-Turcotte-Pugh (CTP) class, Model for End-stage Liver Disease (MELD) score), length of postoperative hospital stay (LoS), in-hospital mortality, postoperative morbidity, tumor recurrence rate, median survival time (MS), overall survival (OS) and disease free survival (DFS). OS and DFS were assessed 6 months, 1, and 2 years after surgery. Patients who died in early postoperative period were included in the survival analysis. Statistical analysis was performed using SPSS 22.0 software package. Normality of data was checked by the Shapiro-Wilk test. Categorical variables were compared using chi-square and continuous variables using the Student's t-test. Quantitative data were expressed as mean and standard deviation. Survival analysis was performed by the Kaplan-Meier survival method and compared using the log-rank test. P values  $<0.05$  were considered significant.

The study was approved by Ethics committee of LSMU (approval No. BEC-MF-434).

## Results

Mean age of patients in LR group was 65.5 (9.9) years, as in RFA group – 60.8 (11.2) years ( $P = 0.124$ ). In LR group were 19 (73.1%) male and 7 (26.9%) female patients, whereas in RFA group were 16 (72.7%) males and 6 (27.3%) females ( $P = 0.978$ ). The mean size of the largest tumor was significantly bigger in LR group (9.2 (4.7) vs 3.2 (1.3) cm,  $P < 0.05$ ).

## Conclusions

1. Patients treated with RFA had significantly smaller tumors and worse underlying liver function. 2. Patients after RFA treatment had significantly shorter hospital stay, lower rate of in-hospital mortality and postoperative morbidity. 3. There were no significant difference between median survival time and median disease-free survival time between patients who had LR or RFA. Overall survival after 6 months and 1 year was superior in RFA group.

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## SEROLOGICAL MARKERS FOR THE DIAGNOSIS OF ACUTE MESENTERIC ARTERYS ISCHAEMIA. A REVIEW OF LITERATURE.

*Rokas Linkevičius, Karolis Černauskis*

*Supervisor of the abstract: Evaldas Torrau*

*Lithuanian University of Health Sciences, Department of surgery, Lithuania*

## Introduction

Intestinal ischaemia, in particular due to acute thrombo-embolic occlusion of the mesenteric arteries, is associated with high total mortality. Although, even experienced clinicians find it difficult to diagnose the patients quickly enough to permit timely intestinal revascularisation before it progressed from intestinal ischaemia to necrosis. Still, it remains a challenging problem linked to the lack of reliable diagnostic biochemical tools, which would be realistically

pathognomonic for this life threatening condition. With this research, we set out to determine and find which serological markers could be used for diagnosis of acute mesenteric artery ischaemia.

### **Aim**

To research, analyse and evaluate the scientific literature about available serological markers for the diagnosis of acute mesenteric artery ischaemia.

### **Objectives**

1. Research and identify, what kind of serological markers could be used for the diagnosis of acute mesenteric artery ischaemia.
2. Research and identify, which serological markers could be practical for the diagnosis of acute mesenteric artery ischaemia in the routine clinical practice.

### **Methods**

The research of scientific literature was performed using these data bases: Pubmed, Science direct, Springerlink, EBSCO publishing. These key words were used for the search: markers for the diagnosis of acute mesenteric artery ischaemia (AMAI), biomarkers of acute mesenteric artery thrombosis, acute mesenteric artery ischaemia, diagnosis of mesenteric ischaemia, mesenteric artery infarction. We reviewed 42 publications from 2001 till 2015 years and 26 of them, in which serological markers in humans for the diagnosis of AMAI thoroughly discussed, were selected for further analysis, rejecting studies with animals.

### **Results**

1. These markers could be used for AMAI diagnosis: D-lactate, lactate dehydrogenase(LD), aspartate aminotransferase(AM), glutathione S-transferase(GST), intestinal fatty-acid binding protein(I-FABP), D-dimer, ischaemia-modified albumin(IMA), creatine kinase-B(KKB), alkaline liver phosphatase(ALP), cobalt-albumine binding assay(CABA).
2. In reviewed articles (7 of 26), D-dimer changes could be practical for AMAI diagnosis as an additional tool, because it is cheap, quick and available in every hospital. Cudnik MT et al. study show D-dimer sensitivity 96%, but the clinicians cannot rely only on this marker (lacks specificity, varies from 18% to 78.5% in analysed publications) and must be combined with CT angiography (Akyildiz H et al.). I-FABP show good results (14 of 26 articles significantly increases on AMAI period from 2.53 ng/ml to 149.74 ng/ml). M.Guzel et al. study show that I-FABP increases more than D-dimer (I-FABP 80 pg/ml suspected AMAI group, 421 pg/ml diagnosed group, D-dimer 435 ug/l suspected group, 675 ug/l diagnosed group). However, it is difficult to suspect it, because it requires ELISA measuring system and cooperation with medical genetic specialists (Funaoka H et al.). D-lactate, GST may offer improved diagnostic accuracy compared to D-dimer (Evennett NJ et al.). CABA, in only 1 study by Polk JD et al., show good results (ST 100%,SF 85.7%), but short sample size make it doubtful. LD, AM, IMA, KKB, ALP show insufficient accuracy in analysed articles (3 of 26) and are not appropriate markers.

### **Conclusions**

1. Plasma D-dimer concentration detection could be a practical additional element for suspected AMAI diagnosis.
2. According to analysed literature, I-FABP might be also used for diagnosis of AMAI as an additional diagnostic tool.
3. Further prospective reliable clinical trials with larger sample size are needed in order to enter the routine clinical practice for novel additional AMAI diagnostic serological markers.

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# STRANGULATED INGUINAL HERNIA - TREATMENT RESULTS

Vytautas Junčys, Titas Telksnys

Supervisor of the abstract: Mindaugas Kiudelis, Vytenis Mikutaitis

Lithuanian Health and Science University, Lithuania

## Introduction

Strangulated inguinal hernia happens when the omentum or a loop of intestine is trapped in the inguinal canal and the blood supply to organ is discontinued. This happens more often for men than women.[1]Inguinal hernia is about 75% of all abdominal hernias and risk of having it is 27% for men and 3% for women.[2]The main medical treatment is surgical(using mesh or own body tissues).

## Aim

To analyze the results of 2003-2013 surgical treatment for strangulated inguinal hernias.

## Objectives

1. To assess patients demographic figures.
2. To measure frequency of early postoperative complications.
3. To measure frequency of hernia's relapse.
4. To evaluate patient's early postoperative pain and opinion about postoperative scar.
5. To evaluate prognostic risk factors for bowel necrosis.

## Methods

We retrospectively analyzed case histories of 148 patients, who were surgically treated for strangulated inguinal hernia in 2003-2013 at LHSUH Kaunas clinics surgery department. Collected data was: gender, age, intrahospital stay, time from strangulation to operation, types of surgery that was performed(Lichtenstein, laparoscopic, Shouldice), early postoperative complications (happened at first 14 days after surgery). Late postoperative complications(hernia's recurrence, more than 14 days after surgery), patient's opinion about postoperative scar (satisfaction), height and weight (body mass index), pain after surgical procedure (10points visual analogue scale, opinion about pain felt at first 14 days after surgery) were collected by calling directly to patient. Patient's present physical state was evaluated according to the physical state evaluation after hernia's surgical operation protocol. According to the method of surgery, patients were divided into groups: first consisted of 100 patients, who underwent Shouldice operation, group 2-28 patients, who had Lichtenstein, group 3-20 patients, who had laparoscopic surgery. Statistical analysis was performed using SPSS 21.0(student's t test,  $\chi^2$  criteria, logistic regression), results were stored in a statistically significant level  $p < 0,05$ .

## Results

1. There were 88(59.5%) men and 60(40.5%) women. The mean of overall age was  $66.1 \pm 20.4$  years. The mean time from strangulation to surgery was  $3,2 \pm 2,1$ (hours), accordingly laparoscopic surgery was  $3,4 \pm 2$ (hours), Shouldice -  $3,1 \pm 2,1$ (h.), Lichtenstein -  $3,5 \pm 2,2$  (h.). Statistically significant differences were not obtained( $p = 0,095$ ). The mean of intrahospital stay was  $5.0 \pm 5.0$  days and longer after Shouldice and Lichtenstein operations comparing to laparoscopic surgery ( $p = 0.013$ ), accordingly after Shouldice -  $5.0 \pm 4.9$  days, after Lichtenstein -  $7.0 \pm 6.5$  days, after laparoscopic surgery -  $2.6 \pm 1$  days, other indicators did not differ significantly. Most common content of strangulated inguinal hernia was small intestine ( $n = 95/148;64.2\%$ ), omentum -  $28/148$  (18,9%) cases, small intestine with omentum  $14/148(9,5\%)$ , preperitoneal fat -  $7/148(4,7\%)$  cases and small intestine with preperitoneal fat  $4/148(2,7\%)$  cases. 23.0% of patients had hernias content necrosis and resection of necrotized organ. Mostly necrotized strangulated small intestine with preperitoneal fat -  $2/4$  (50%) cases, small intestine and omentum -  $5/14$  (35.7%) cases, preperitoneal fat -  $2/7$  (28.6%) cases, small bowel  $21/95$  (22.1%) cases, omentum -  $4/28$  (14.3%) cases. Mean length of resected bowel was  $34.0 \pm 38.5$ (cm). 2. Early postoperative complications were diagnosed in 31,8% of cases

(n = 47/148). After laparoscopic surgery - 30.0%(n = 6/20), after Shouldice-29.0%(n = 29/100), after Lichtenstein-32,1%(n = 9/28). There was no statistically significant difference between early postoperative complications and operations(p = 0.171). Most common early postoperative complication was pneumonia 12(8.1%) cases. 3. 54(36.5%) patients were interviewed by phone. Hernia recurrence was determined in 7(13.0%) patients, 1 case(14,3%) after Lichtenstein operation, 6 cases(85,7%) after Shouldice operation. There was no statistically significant difference between groups(p = 0.274). 4. Significantly stronger pain was after Shouldice operation comparing to laparoscopic surgery(p = 0.023). The pain was not significantly different between laparoscopic and Lichtenstein operations(p = 0.322) as well as comparing Shouldice and Lichtenstein(p = 1.0). 53(98.1%) patients were satisfied with postoperative scar cosmetic view. 5. Hernia content necrosis probability increases: when a patient is older than 76 years - 0,249 times(CI 95% 0.110 to 0.562;p = 0.001); when body mass index(BMI) is higher than 28,5 points - 0.111 times (CI 95% 0.013 to 0.970;p = 0.047); when hernia is strangulated more than 2 hours - 0.186 times (CI 95% 0.053 to 0.647,p = 0.008); when person is feminine gender - 0.131 times (CI 95% 0.054 to 0.318, p < 0.001).

### Conclusions

1. Open surgery was commonly performed without mesh in strangulated inguinal hernia and mostly diagnosed in older men.
2. Early postoperative complications were diagnosed in 31,8% patients, of which the most common was pneumonia.
3. Hernia recurrence frequency was 13.0%. 6 times more often after Shouldice operations than Lichtenstein. No case after laparoscopic repair was determined.
4. Postoperative pain was increased after open surgery comparing to laparoscopic.
5. Hernia content necrosis probability increases: when a patient is older than 76 years - 0,249 times; when body mass index(BMI) is higher than 28,5 points - 0.111 times; when hernia is strangulated more than 2 hours - 0.186 times; when person is feminine gender - 0.131 times.

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## **SURGERY II SESSION**

# ASSESSMENT OF ENHANCED RECOVERY TREATMENT PROGRAM DURING TOTAL KNEE OR HIP ARTHROPLASTY STATIONARY MEDICAL CARE

*Simonas Laukaitis, Adas Čepas*

*Supervisor of the abstract: Šarūnas Tarasevičius, Alfredas Smailys, Vytautas Mažutavičius*

*Department of Orthopaedics and Traumatology, LSMU, Lithuania*

## **Introduction**

The number of total hip and knee arthroplasties is increasing each year in Lithuania. Comparing total numbers of hip and knee endoprotheses for 100 000 people (112 hip and 121 knee), Lithuania is not so far behind Western Europe countries. However, patients stay in hospital for 7 days in Lithuania, while in Western Europe they are discharged from hospital in the first 3-4 days. In order to improve the quality of treatment, shorten bed days and cut expenses, the Department of Orthopaedics and Traumatology (LSMU KK) started to treat patients by the new „Enhanced recovery program“ protocol.

## **Aim**

Identify suitability of enhanced recovery program for total hip or total knee arthroplasty.

## **Objectives**

1. Evaluate and compare blood loss and need for blood transfusions between standard and enhanced recovery groups.
2. Evaluate and compare pain and requirement of additional analgesics between the two groups.
3. Evaluate and compare patients' ability to be mobilised early after surgery (after 6 hours).
4. Evaluate and compare overall health before and after surgery between two groups.
5. Evaluate and compare the numbers of bed days. 6. Assess overall costs of medications and medical supplies.

## **Methods**

Prospective study was carried out in LSMU Hospital, Clinic of Orthopaedics and traumatology. The study involved patients older than 18 years who were planned to undergo total hip or total knee arthroplasty, accepted to participate in the study and were only afflicted with knee or hip arthrosis. Patients were divided into two groups: a) Standard treatment group (STG); b) Enhanced recovery group (ERG). With patient's consent EQ-5D health questionnaire to evaluate the health status was filled and full blood count test was obtained preoperatively. During postoperative period full blood count test, pain evaluation using VAS and motorblockade assessment using Bromage scale were performed. Furthermore, we evaluated the side effects, surgical complications, bed days, requirement of additional analgesics. EQ-5D health questionnaire data after two months and frequency of blood transfusions were also reviewed and evaluated. Finally, the differences between overall costs of medications and medical supplies were assessed in both groups of patients. Statistical package SPSS 17.0 and Microsoft Office Excel 2007 were used for statistical analysis. Means, standard deviation, frequencies and other descriptive statistics were counted. The independent samples T-test method was used to compare the means. Data were considered statistically significant if value  $p < 0,05$ .

## **Results**

The sample consisted of 60 patients (30 ERG and 30 STG). There was no significant difference between STG and ERG regarding age. The mean number of bed days in the ERG was  $5,13 \pm 0,99$  days (from 4 to 8 days) and in the STG -  $7,40 \pm 0,89$  days (from 6 to 10 days), the difference between the groups was statistically significant ( $p < 0,05$ ). Blood transfusions were done for 3,33% ERG patients and 20% STG patients. Only 6,66% of ERG patients required bladder catheterization. 63,33% of ERG patients (20% - during the first postoperative day) and 100% STG patients needed diazepam during the first days after surgery. ERG patients did not need narcotic analgesics for pain relief as distinct from 40% of STG patients. Postoperative pain was evaluated using VAS. Mean values of VAS in STG were  $3,55 \pm 2,35$

and in ERG -  $5,03 \pm 2,4$ , a statistically significant difference was observed between the groups ( $p < 0,05$ ). Bromage scale assessment: ERG - 83,33% patients were able to lift the leg and to bend the knee, 16,6% were able to move the foot, STG - 93,33% patients were able to move the foot and 6,66% were not able to move the leg. Nausea and vomiting: ERG – 90% were not nauseous, 6,66% were nauseous, 3,33% were nauseated and vomited, STG – 80% were not nauseated, 20% were nauseous. In ERG 60% did not require additional analgesics, 30% required a single dose of analgesics and 10% required two or more doses. In STG 43,33% did not require additional analgesics, 33,33% required a single dose of analgesics and 23,33% required two or more doses. No significant differences between the results of EQ-5D questionnaire before and two months after the surgery were observed. The mean cost of single ERG patient was  $47,08 \pm 9,27\text{€}$ , STG –  $130,43 \pm 15,65\text{€}$ .

### Conclusions

1. ERG patients lose less blood than SG patients, so they need less blood transfusions.
2. ERG patients tolerate pain better, they also require statistically significantly less analgesics after surgery. They also do not need narcotic analgesics.
3. ERG patients can lift leg and bend knee after surgery, while SG patients can only move feet. That is why ERG patients can be mobilised after 6 hours after operation.
4. There was no significant difference evaluating overall health before and 2 months after surgery between groups.
5. There is significant difference between ERG and SG patients. ERG patients stay in hospital 2 days less.
6. Single ERG patient costs 83.35 € less than SG patient.

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## BLOOD CLOT AND PLATELET-RICH FIBRIN RESISTANCE AGAINST MICROORGANISM INDUCED FIBRINOLYSIS

*Donatas Nomeika*

*Supervisor of the abstract: Gintaras Janužis*

*Lithuanian University of Health Sciences, Lithuania*

### Introduction

Alveolitis still remains one of the most common late post-extractional complications, which is diagnosed 1-4% of all cases and reaches significant 37,5% while removing third mandibular molars. Various microorganisms, including *Bacillus cereus*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Candida albicans*, release endotoxins and induce the lysis of the blood clot which results as an inflammation of alveolitis. Platelet rich fibrin (PRF) consists of great number of growth factors, cytokines and platelets, which reduce the inflammatory process.

### Aim

To evaluate PRF and blood clot resistance against microorganism induced fibrinolysis.

### Objectives

1. Quantitative and qualitative evaluation of *Bacillus cereus*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Candida albicans* fibrinolytic activity in blood clot.

2. Quantitative and qualitative evaluation of *Bacillus cereus*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Candida albicans* fibrinolytic activity in PRF.
3. Compare concentration of D-dimers in both mediums after 1 and 3 hours of incubation.

### Methods

To perform this study a permission from LSMU Bioethics center was received. Blood samples were taken from 40 young and healthy volunteers. For each of them three types of test-tubes were used: 1) A- containing trisodium citrate, 4,5 ml (blue). 2) B- without additional reagents, 5 ml (red). 3) C – PRF vacutainer, 10 ml (brown). Samples were divided in 4 groups, 10 volunteers each. Every group underwent the experiment with one of the following microorganisms: *Bacillus cereus*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Candida albicans*. Tube A immediately after blood drawing procedure was centrifuged for 9 minutes, 2500 RCF (Hettich Rotina 35, Germany). This is how blood plasma is made. After 3 hours of incubation in room temperature, concentration of D- dimers was measured (STAGO Diagnostics, STA Compact, France). Tube B was kept in room temperature for 10 minutes and then for 3 hours in 37°C thermostat. After blood is fully coagulated, blood serum is removed using Paster pipette. Tube C immediately after blood drawing procedure is centrifuged for 14 minutes, 1500 RPM (EBA 20, Germany). PRF is then separated from the rest of blood clot and transported to another tube without additional reagents (red, named – D). Preparation of bacteria and fungus suspension: 3-5 isolated colonies on blood medium are touched with sterile tag and carried into tube with saline. Solution is adjusted to 0,5 McFarland ( $1 \times 10^8$  CFU/ml) and then diluted to 0,25 McFarland ( $1 \times 10^4$  CFU/ml). Solution is poured into disposable tubes, 1ml each. From tube A 1ml of blood plasma is carried to tube B and tube D using Finnpiptette batcher. Then, using the same batcher, 1 ml of prepared bacteria suspension is carried to the same tubes. In tubes B and D a concentration of D-dimers is evaluated after 1 and after 3 hours. Data were processed using program – R , v3.0.3. Mann-Whitney Wilcoxon criteria was used.

### Results

1. After 1 hour, concentration of D-dimers in blood clot (tube B) increased significantly in all 4 groups,  $p < 0,05$ .
2. After 3 hours, concentrations of D-dimers in blood clot increased significantly in 3 groups- *S. pneumoniae*, *S. aureus*, *C. albicans*,  $p < 0,05$ . No statistically significant data was received from 1 group- *B. Cereus*,  $p > 0,05$
3. In all 4 groups, no significant change of D-dimers concentration was recorded in PRF after 1 and 3 hours of incubation,  $p > 0,05$ .
4. In 3 groups (*S. pneumoniae*, *S. aureus*, *C. albicans*) concentration of D-dimers after 1 hour was greater in blood clot than in PRF. In *B. cereus* group no statistically significant data was received,  $p > 0,05$ .
5. After 3 hours of incubation, there was no statistically significant difference among concentrations of D-dimers in PRF and blood clot in 3 groups (*B. cereus*, *C. albicans*, *S. aureus*). In *S. Pneumoniae* group, concentration was greater in blood clot medium,  $p < 0,05$ .

### Conclusions

1. Fibrinolysis in blood clot is most active after 1 hour of incubation and is significantly greater than in PRF.
2. Fibrinolysis induced by mircoorganisms is completely inhibited in PRF clot after 1 and 3 hours of incubation.

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## COMPARISON BETWEEN TIME INTERVAL OF CLINICAL AND PATHOLOGICAL STAGING EVALUATION AND THEIR DIFFERENCES IN PATIENTS WITH NON-SMALL CELL LUNG CANCER

*Paulius Šimkus, Vytenis Keturakis*

*Supervisor of the abstract: Jurgita Zaveckienė*

*Department of Cardiac, Thoracic and Vascular Surgery, LSMU, Lithuania*

### Introduction

Worldwide, lung cancer is leading by incidence of all cancers in men. Non-small cell lung cancer (NSCLC) accounts for ~85% of all lung cancer cases [1]. Clinical TNM (cTNM) evaluation is based on 7th edition of TNM lung cancer staging [2]. Chest computed tomography (CT) is the major method to determine tumour size (T) and pathological lymph nodes (N) [3]. Response evaluation criteria in solid tumours (RECIST) 1.1 guidelines states that CT is reliable for evaluation if it is performed less than 28 days before beginning of treatment [4]. cTNM stage is used for treatment strategy. If NSCLC is resectable and has no metastasis, thoracotomy is performed. Pathological staging (pTNM) is received after the surgery [5]. However, cTNM and pTNM not always are the same and in clinical practice sometimes time period between CT and surgery exceeds 28 days.

### Aim

To compare clinical and pathological TNM staging differences within or over 28 days interval before treatment in patients with NSCLC.

### Objectives

- 1) To compare T criterion differences in patients who underwent surgery up to 28 days after CT and later than 28 days.
- 2) To compare N criterion differences in patients who underwent surgery up to 28 days after CT and later than 28 days.
- 3) To determine TNM stage differences in patients who underwent surgery up to 28 days after CT and later than 28 days.

## Methods

Retrospectively 31 cases of patients were reviewed who had been surgically treated in LSMU Kaunas Clinics Thoracic surgery Department during January 2014 – February 2015. All patients with NSCLC underwent lung volume reduction radical surgery – lobectomy, bilobectomy or pneumonectomy. Lymphadenectomy of the N1 group, subcarinal and ipsilateral paratracheal lymphatic nodes were carried out in all the cases, tissues were sent to the pathological examination for the evaluation of pathological TNM. Clinical T and N criteria were evaluated using chest CT data. All patients had no confirmed distant metastasis, therefore M0 criterion was used for all the cases. Time period between cTNM and pTNM was calculated by day's interval between CT examination and surgery. Patients were divided into 2 groups: group 1 consisted of patients who underwent surgery less or equal 28 days after CT, and group 2 was made of patients who waited for surgery longer than 28 days.

Statistical analysis was performed using SPSS 22. P-value <0,05 was regarded as statistically significant.

## Results

31 patient data were analysed. Male - 25 (80,6%) and female - 6 (19,4%). Patients mean age was  $66,26 \pm 7,2$ . Minimum age was 50 years, maximum age was 78 years. Mean days interval between CT and surgery was  $30,13 \pm 16,1$ . Group 1 consisted of 17 patients (54,8%) and group 2 – 14 patients (45,2%). T criterion changed for 11 patients: group 1 – 3 of 17 (17,6%), group 2 – 8 of 14 (57,1%) ( $p < 0,05$ ). N criterion changed for 8 patients: group 1 – 4 of 17 (23,5%), group 2 – 4 of 14 (28,6%) ( $p > 0,05$ ). TNM stage changed for 10 patients: group 1 – 3 of 17 (17,6%), group 2 – 7 of 14 (50%) ( $p > 0,05$ ).

## Conclusions

1. T criterion has changed more often in group 2 (17,6% < 57,1%). Changes were statistically significant ( $p < 0.05$ ), despite little amount of cases.
2. N criterion has changed more often in group 2 (23,5% < 28,6%), but it was not statistically significant ( $p > 0,05$ ), possibly due to small number of patients.
3. TNM stage changed more often in group 2 (17,6% < 50%). Changes were not statistically significant ( $p > 0.05$ ), presumably because of small quantity of patients.

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# COMPARISON BETWEEN TWO SELF-ADMINISTERED QUESTIONNAIRES (SCS-M AND SLQQ) TO ASSES ERECTILE DYSFUNCTION AMONG THE YOUNG MEN: A PILOT STUDY

*Gediminas Brazaitis, Greta Pečiulytė*

*Supervisor of the abstract: Darius Skaudickas*

*Department of Urology, LSMU, Lithuania*

## **Introduction**

Due to a need to dominate, men tend to hide their ailments and proclaim themselves as healthy. The recent reports, however, suggest that erectile dysfunction is not uncommon with Matulevicius et al. finding an erectile dysfunction prevalence of 26,25% amongst young Lithuanian men. Screening, diagnosis and assessment of the management of male and female sexual dysfunctions have been greatly improved by the scientific development of self-administered questionnaires. The present pilot study addresses the ability to evaluate erectile dysfunction among the young men using two different self-administered questionnaires and provides the comparison across them (especially, in the terms of reliability) prior to their complete validation.

## **Aim**

To conduct a pilot study for comparison of two self-administered questionnaires (SCS-M and SLQQ) to asses erectile dysfunction among the young male individuals.

## **Objectives**

1. To evaluate the prevalence of difficulty achieving erection using two different questionnaires (SCS-M and SLQQ).
2. To evaluate BMSFI mean scores for libido, erection, ejaculation, problem assessment, overall satisfaction and asses the prevalence of erection scores.
3. To asses the prevalence of different intensiveness difficulty to achieve erection using the SCS-M and the SLQQ questionnaires.
4. To asses the correlation between the different intensiveness difficulty to achieve erection assessed by using the SCS-M and SLQQ questionnaires, and the BMSFI Erection score.
5. To evaluate reliability of the SCS-M and SLQQ questionnaires.

## **Methods**

The prospective study was carried out on random group of young male individuals (ethical approval was obtained on 2014 09 04 (No. BEC-MF-01)) either studying at the LSMU or attending the outpatient care facilities at the Hospital of LSMU Kauno Klinikos from 2014 09 04 to 2015 02 10. The study included 50 participants (aged from 20 to 30 years). They were questioned using Sexual Complaints Screener for Men (SCS-M), Sexual Life Quality Questionnaire (SLQQ) and Brief Male Sexual Functioning Index (BMSFI). All the questions in these questionnaires are focused on male sexual complaints. The SCS-M and SLQQ have not yet been validated in Lithuania. Despite that, both of them were translated into lithuanian in order to use them among the lithuanian-speaking individuals (the titles of the lithuanian versions of the questionnaires were accordingly abbreviated as SNS-V and SGKK). The BMSFI is validated in Lithuania, so the validated version was used. The statistical analysis of the data was performed using MS Excel 2007 and IBM SPSS Statistics 20.0, evaluating frequencies, means, Pearson correlation and employing internal consistency method (to find out the reliability of the questionnaire by finding alpha ( $\alpha$ ) values). The statistical significance of  $p < 0,05$  has been assigned.

## **Results**

1. In the SCS-M, 9,8% of the respondents claimed having a difficulty to achieve erection. In the SLQQ, 7,3% claimed having a difficulty to achieve erection.

2. In the BMSFI, the mean scores were obtained as follows: libido - 7,29 ( ± 1,33), erection - 11,00 ( ± 1,75), ejaculation - 7,29 ( ± 1,63), problem evaluation - 11,24 ( ± 1,63), overall satisfaction - 3,59 ( ± 0,63). The prevalence of erection scores: 5 scores (s.) - 2,4%, 6 s. - 2,4%, 7 s. - 2,4%, 8 s. - 2,4%, 9 s. - 4,9%, 10 s. - 7,3%, 11 s. - 17,1%, 12 s. - 61,0%.
3. In the SCS-M, the prevalence of low intensity difficulty (never/almost never, seldom) to achieve erection was 85,3% and high intensity difficulty (sometimes, often, almost all the time) - was 2,4%, did not answer 12,3%. In SLQQ, the prevalence of low intensity difficulty (considering it more easy) to achieve erection was 90,2% and high intensity difficulty (considering it more difficult) - was 7,3%, did not answer 2,4%.
4. The intensity of difficulty achieving erection correlated with BMSFI Erection score whether assessed with the SCS-M ( $r = -0,653$ ,  $p = 0,000$ ) or the SLQQ ( $r = 0,378$ ,  $p = 0,016$ ).
5. According to internal consistency, Cronbach's alpha value was high ( $\alpha = 0,78$ ) for the SCS-M and low ( $\alpha = 0,45$ ) for the SLQQ.

### Conclusions

1. The prevalence of difficulty achieving erection among young men ranged from 7,3% to 9,8%, depending on the chosen self-administered questionnaire (accordingly, SLQQ or SCS-M).
2. Using the BMSFI, mean scores were obtained either maximum or high among young men and 61,0% of young men obtained maximum score for the erection.
3. The prevalence of high intensity difficulty achieving erection ranged from 7,3% to 2,4%, depending on the chosen questionnaire (accordingly, SLQQ or SCS-M).
4. The intensity of difficulty achieving erection correlated with BMSFI Erection score whether assessed with the SCS-M or the SLQQ, however, the correlation appeared to be stronger in a case of SCS-M.
5. The SCS-M questionnaire provides a reliable tool for assessing erectile dysfunction among young men. However, SLQQ is not a reliable tool and needs further improvement in its structure.

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## COMPARISON OF DEBRIDEMENT METHODS FOR TREATMENT OF THE FOREARM AND HAND DEEP DERMAL BURNS

*Justas Keršulis, Ina Azarovičiūtė*

*Supervisor of the abstract: Ernest Zacharevskij*

*Plastic and Reconstructive surgery department (Lithuanian University of Health Sciences), Lithuania*

### Introduction

Treatment of forearm and hand burns is distinguished for specificity. Hand anatomy evaluation - important and delicate structures fit into a relatively limited space, coated with skin without a thick subcutaneous layer. Hand and forearm burned area tissue surgical debridement is technically difficult, too aggressive to the remaining healthy dermis (reduces the chance of burn wound self epithelisation) and can lead to serious complications (micro vascular and neurological damage), it should be done delicately or alternative debridement method should be chosen. According to scientific data, a sterling and selective removal of non-viable tissue leads to faster wound epithelisation, reduces the risk of scarring and induces a better functional recovery.

### Aim

Comparison of selective debridement methods efficiencies for treatment of the forearm and hand deep dermal burns.

## Objectives

1. Evaluate wound epithelisation time using autolytic, enzymatic and mechanical debridement.
2. Evaluate wound contamination by microorganisms (m/o) using different methods of debridement.

## Methods

We represent randomized, controlled, single-blind, parallel-group clinical trial designed to compare enzymatic, mechanical and autolytic debridement methods for treatment of the forearm and hand deep dermal burns. Patients were selected using clinical burn investigation and Laser Doppler imaging (LDI) and randomized into four groups. LDI burn wound healing prediction of no more than three weeks was the obligatory factor to access the study. I group of patients got hydrocolloid dressings for the burn treatment, which promote autolytic debridement. II group was treated with enzymatic dressings. III group got treatment combination - dressings with silver sulfadiazine cream and mechanical debridement with special single-use pad of monofilament polyester fibers. IV (control) group of the patients we used standard treatment - dressings with silver sulfadiazine cream. Study lasted three weeks for each patient till total burn wound epithelization happened; alternatively split thickness grafting was performed. Data was analyzed using SPSS 22.0.

## Results

1. There was 38 patients in the research. In I (Hydrocolloid) group there were 7 patients, whose age's mean was  $45.5 \pm 9.00$  years, group consist of 3 (42.85%) women and 4 (57.14%) men, perfusion units mean was  $423.14 \pm 30.84$ . Mean of total burn area of the body was  $12.00 \pm 4.32\%$ , mean of burned wound size was  $90.14 \pm 12.62$  cm<sup>2</sup>. In II (enzyme) group there were 11 patients, whose age's mean was  $48.91 \pm 6.24$  years, group consist of 5 (45.45%) women and 6 (54.54%) men, perfusion units mean was  $444.91 \pm 25.87$ . Mean of total burn area of the body was  $15.64 \pm 5.03\%$ , mean of burned wound size was  $104.8 \pm 14.82$  cm<sup>2</sup>. In III (mechanic) group there were 6 patients, whose age's mean was  $53.25 \pm 10.19$  years, group consist of 3 (50%) women and 3 (50%) men, perfusion units mean was  $378.75 \pm 48.77$ . Mean of total burn area of the body was  $14.00 \pm 5.83\%$ , mean of burned wound size was  $89.5 \pm 15.32$  cm<sup>2</sup>. In IV (control) group there were 14 patients, whose age's mean was  $53.92 \pm 12.67$  years, group consist of 4 (28,57%) women and 10 (71.43%) men., perfusion units mean was  $434.43 \pm 20.99$ . Mean of total burn area of the body was  $20.15 \pm 7.64$ , mean of burned wound size was  $109,6 \pm 16.28$  cm<sup>2</sup>. 2. Epithelisation time in the I group was  $14.43 \pm 5.16$  d., II -  $20.55 \pm 3.80$  d., III -  $20.95 \pm 5.05$ d. IV group was  $19.64 \pm 5.69$  d. Significant difference was found between I and II, III, IV groups ( $p < 0.05$ ).

## Conclusions

1. Hydrocolloid dressing seems to be an effective instrument for debridement and treatment of the forearm and hand deep dermal burns with LDI healing prediction less than three weeks.
2. Wound healing with enzymatic debridement seems to have less contamination by m/o than healing with hydrocolloids and standard treatment - dressings with silver sulfadiazine cream.

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# CUTANEOUS SQUAMOUS CELL CARCINOMA ORIGIN AND ITS RELATION WITH PATHOLOGICAL OUTCOME

Rokas Liubauskas, Simonas Jonas Norvydas

Supervisor of the abstract: Donatas Samsanavičius

Department of Plastic and Reconstructive Surgery, LSMU, Lithuania

## Introduction

Cutaneous squamous cell carcinoma (CSCC) is the second most common form of skin cancer in the world<sup>[1]</sup>. The incidence of CSCC is increasing considerably. Most cases of CSCC are localized and treated by surgical excision. The percentage of primary CSCC that metastasize is under 5%, however, one subset of disease is more biologically aggressive and has a greater tendency towards recurrence and metastasis. High - risk criteria according to new edition of AJCC manual consists of: tumor diameter (>2cm); location (head region); differentiation; tumor Breslow thickness (>2mm). We conducted a study to evaluate, whether there are any differences in high-risk criteria among tumors developed from previous skin lesions or intact skin.

## Aim

To evaluate relation between the context of cutaneous squamous cell carcinoma (CSCC) development and its clinical presentation, pathological outcome.

## Objectives

1. To evaluate the context of tumor development.
2. To evaluate the period of time between onset of the disease and doctor appointment.
3. To evaluate different localization, thickness and size of the tumors.
4. To evaluate differences in pathological outcome between tumors developed from skin lesions or intact skin.

## Methods

We conducted a study in which we enrolled patients who were treated in HLSMU Department of Plastic and Reconstructive surgery between Nov. 2012 and Dec. 2014. Patient consent was obtained beforehand. All patients were evaluated via medical history, physical examination, tumor biopsy and underwent a surgery - tumor excision followed by histopathological examination. Patients who had developed tumors from skin lesions were assigned to group A. Patients with tumors developed from intact skin assigned to group B. Statistical analysis was performed using SPSS 21.0 software package. Mann-Whitney U Test and chi square test were used with significance level of 0.05.

## Results

Total of 36 patients were included in the study (23 female, 13 male). Group A (tumor from skin lesion) - 14 patients, group B (tumor from intact skin) - 22 patients. Mean age in group A was  $75.61 \pm 11.3$ , in group B  $74.73 \pm 9.1$  years. Most of the tumors originated from chronic wounds - 57.1%, 28.6% tumors developed from warts and 14.3% from scars. Mean time of tumor growth until confirmed diagnosis was 25.3 months for group A, and 30.1 months for group B respectively. Mean diameter of tumors developed from lesions was  $4.5 \pm 6.5$  cm, for intact skin tumors -  $3.00 \pm 6.25$  cm ( $p = 0.121$ ). 25 (69,4%) tumors were localized on the head and neck and 11 (30.6%) on the extremities or torso. Tumor distribution in these areas based on the lesion existence on origin site: from the 25 tumors localized on the head and neck, 8 (32%) were from group A and 17 (68%) from group B. Respectively, from the 11 tumors on the torso/extremities - 6 (55.5%) formed from lesions and 5 (45.5%) from intact skin. Mean breslow depth in the group of tumors originated from lesions -  $2.71 \pm 1.8$ mm. Group of tumors developed from normal skin -  $2.52 \pm 2.4$ mm. Breslow depth did not differ significantly. Pathological results: in group A pathological outcomes consisted of 5 (42.9%) tumors of pT1 stage, 7 (50%) of pT2 and 1 (7.1%) of pT4. Group B pathological outcomes consisted of 13 tumors (59,1%) of pT1 stage and 9 (40,9%) tumors of pT2 only. Group B consisted of 60% of low-grade (G1) tumors. Group A had 76.9%

of low grade tumors.

### Conclusions

1. 14 out of 36 tumors originated from skin lesions: more than half - from chronic wounds.
2. There is a tendency, that tumors originated from previous lesions, are diagnosed earlier, however we did not determine statistically reliable result.
3. Tumors originated from lesions do not differ in size compared with intact skin tumors. Two-thirds of intact skin tumors were localized in the head region.
4. Breslow depth did not differ significantly between groups. Almost all tumors from primary lesions were low-grade (G1), while only half of intact skin CSCC was G1 grade. Case of pT4 stage tumor was observed only within group of tumors originated from lesions.

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## EFFICIENCY OF TREATMENT METHODS FOR BONE CYSTS OF THE HUMERUS IN PEDIATRIC PATIENTS

*Ritauras Rakauskas, Martynas Jurenas*

*Supervisor of the abstract: Associate Professor Emilis Cekanauskas*

*Department of Paediatric Surgery, Department of Pediatric Orthopedics and Trauma, Lithuania*

### Introduction

Aneurysmal bone cyst (ABC) is a benign, non-neoplastic lesion of the bone, characterized by channels of blood and spaces separated by fibrous septa. Unicameral bone cyst (UBC) is one of the more common noncancerous bone tumors in children. The true number of these tumors is not known because many are never discovered. 75% of the lesions occur in the first two decades of life, and almost 95% occur in the first three decades. The fibula is a strong, long, tubular bone that can be used as a non-vascularized bone graft for restoration of mechanical continuity and efficiency of the limb after bone defects resulting from cyst resection.

### Aim

To compare efficiency of the different treatment methods for bone cysts of the humerus in pediatric patients.

### Objectives

1. To determine epidemiological data of the patients who suffered from cyst of the humerus.
2. To compare bone structure of the humerus of the same patients' healthy and surgically treated hand by clinical, X-ray and MRI findings.
3. To evaluate quality of life in patients' who underwent surgery to treat the cyst of the humerus.

## Methods

This retrospective study involves 34 patients who have been diagnosed with ABC or UBC of the humerus. All of them were treated at LSMU Kaunas Clinics The Children's Department of Orthopedics and Trauma from 2000 to 2014. Two types of surgeries were performed on those patients: reconstructions of humerus using non-vascularized fibular graft (radical surgery) or curettage of the cyst and packing with autograft, allograft or other synthetic material (non-radical surgery). We arranged an appointment with 13 patients. Clinical examination, X-rays of the humerus were made and patients filled out RFGK questionnaires for life quality evaluation. It has 7 different scales: self-sufficient (SSS), everyday activity (EAS), leisure and sports (LSS), self-evaluation (SES), mood (MS), social health (SHS) and treatment expectations (TES) scales. Possible score on a scale is from 0 to a 100. Score closer to a 100 represents better arm function. If the child is younger than 11 years of age the questionnaire is filled out by one of the parents. MRI scanning was performed on 10 patients who received surgical treatment. Bone structure of the healthy humerus was compared with humerus after the surgery in the same patient. SPSS 22.0 software package was used for statistical analysis. Mann-Whitney U and Fisher's exact test and Chi-square were used. Significance level  $p < 0.05$  was chosen.

## Results

Total number of patients was 34: 27 boys (79.4%) and 7 girls (20.6%). Mean age when treated 10.24 (SD 0.54) (from 0 to 17) years. Mean follow-up was 7.56 (SD 4.75) (from 0 to 15) years. In 31 (91.2%) patients cyst was diagnosed after the pathological fracture and in three (8.8%) patients the first symptom was pain. This difference was statistically reliable ( $p < 0.001$ ). Before the surgery 20 (64.52%) patients suffered from one pathological fracture and 11 (25.48%) patients had two or more fractures. None of the patients with one fracture needed reoperation. Meanwhile 5 (45.45%) of the patients who suffered from two or more fractures needed second surgery. There was statistically significant difference in reoperation rate according to the number of pathological fractures ( $p = 0.002$ ).

In 16 (47.1%) cases ABC was diagnosed and UBC in the rest 18 (52.9%). Number of procedures performed as follows: 14 (35%) radical, 18 (45%) non-radical surgeries, 5 (12.5%) patients were hospitalized to take biopsy and three (7.5%) were treated conservatively. There was a statistically significant difference in average length of postoperative hospitalization between those who received radical (11.78 (SD 1.24) days) and those who received non-radical surgery (7.83 (SD 0.7) days) ( $p < 0.05$ ).

MRI scanning was performed on 10 patients. Seven of them had received radical surgery: in five patients MRI signal intensity was the same in analogical sections of operated and healthy humerus; in two patients minimal cystic insertions were found in the operated section. Three were operated non-radically and in all of theirs operated humerus MRI signal intensity was lower than in healthy humerus. Although there were no significant difference found in MRI data between those groups ( $p > 0.05$ ). While measuring length of the postoperative humerus in X-ray images one patients' bone was 10 cm shorter than in healthy arm ( $N = 13$ ). In others this difference was insignificant (from 0.4 to 1.8 cm).

13 AFLQ questionnaires were filled out: in seven cases after radical and in six after non-radical surgery. Mean results of the scales were as follows (radical vs non-radical surgery): SSS (93.62 (SD 10.3) vs 90.18 (SD 11.17)), EAS (91.19 (SD 12.57) vs 89.07 (SD 13.27)), LSS (93.04 (SD 8.78) vs 88.17 (SD 15.30)), SES (87.04 (SD 12.89) vs 87.59 (SD 13.93)), MS (86.42 (SD 12.48) vs 85.77 (SD 11.7)), SHS (100 vs 96.79 (SD 8)) and TES (94.64 (SD 9.83) vs 93.23 (SD 13.96)). No statistically significant difference were found between the groups ( $p > 0.05$ ).

## Conclusions

1. Cyst of the humerus was more often diagnosed in boys than in girls and usually it is after pathological fracture. Both facts are statistically significant.
2. In five out of seven patients MRIs after reconstruction of humerus using non-vascularized fibular graft showed no difference comparing to healthy humerus. Although there was no statistically significant difference found in groups after radical and non-radical surgery.
3. After both types of surgeries patients were satisfied with the late treatment results, function of their arm and health related life quality evaluated as very good to excellent. No scale average score was lower than 85 and this means, that patients has no struggle with everyday activities, they can do almost any sport, their mood is very good and they are highly satisfied with the results of treatment.

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## ENDOVENOUS LASER ABLATION VERSUS CONVENTIONAL SURGERY FOR THE TREATMENT OF VARICOSE VEINS

*Mantas Kievišas, Vytenis Keturakis*

*Supervisor of the abstract: Linas Velička*

*Department of Cardiac, Thoracic and Vascular Surgery, LSMU, Lithuania*

### Introduction

It is estimated that 10-20% of the world population suffer from superficial varicose veins of the lower limbs[5]. The most common treatment for the patients with varicose veins is surgery which involves saphenofemoral or saphenopopliteal disconnection, stripping of the great or small saphenous vein (GSV or SSV) and removal of superficial varicosities. Surgical intervention for varicose veins usually alleviates symptoms and provides the desirable results for patients. However, the operation may occasionally be associated with significant postoperative morbidity, including pain, dysesthesias, bleeding, groin infection, thrombophlebitis and saphenous nerve damage. In the last decade, alternative treatments such as endovenous laser ablation (EVLA) have gained popularity. EVLA is a percutaneous technique that uses laser energy to ablate abnormal superficial veins. Several authors have claimed that EVLA is not only as effective as conventional surgery, but also offers shorter recovery period, enhanced quality of life (QoL) and a decrease in postoperative morbidity when compared with traditional surgical approaches for varicose veins.

### Aim

To compare outcomes of EVLA and surgery for the treatment of varicose veins.

### Objectives

1. To analyze and compare demographic characteristics of the patients treated with EVLA and surgery.
2. To compare the difference in distribution of clinical classes between EVLA and surgery patients.
3. To compare the difference in QoL 6 weeks, 1 year and 2 years after treatment with EVLA and surgery.
4. To compare overall satisfaction 2 years after treatment with EVLA and surgery.
5. To examine the difference in recurrence rate after treatment with EVLA and surgery.

### Methods

This was a retrospective, cross-sectional study. We performed an analysis of the medical records of 171 patients received surgical treatment for varicose veins in the Hospital of LSMU and 147 patients received EVLA treatment in "Ortopedijos technika" clinic from January 2012 till January 2015.

The following data were recorded: 1) demographics (gender, age, BMI at the time of treatment,); 2) Clinical class of CEAP classification; 3) type of surgery (GSV, SSV or both).

The QoL was assessed by phone call for patients treated 6 weeks, 1 year or 2 years ago using the Aberdeen Varicose Vein Questionnaire (AVVQ) – a disease-specific QoL instrument. The questionnaire is scored from 0 (no effect) to 100 (severe effect).

Exclusion criteria were: age 40, arterial insufficiency, varicose veins due to secondary causes.

Statistical analysis was performed using SPSS 22.0 software package. Normality of data was checked by the Kolmogorov-Smirnov and Shapiro-Wilk tests. Normally distributed data are presented as mean (standard deviation), non-parametric data – as median (interquartile range). Categorical variables were compared using chi-square ( $\chi^2$ ) and continuous variables using the student t-test and Mann-Whitney test, when appropriate. We considered P values of less than 0,05 statistically significant.

The Ethics committee at our university approved the study (approval Nr. BEC-MF-43).

## Results

There were 23,8% of males, 76,2% of females in EVLA group; 32,2% of males, 67,8% of females in surgery group ( $P = 0,093$ ). Mean age – 49 (14,3) years in EVLA group; 51,9 (13,5) years in surgery group ( $P = 0,059$ ). Mean BMI – 26,9 (5) kg/m<sup>2</sup> in EVLA group; 28 (5,4) kg/m<sup>2</sup> in surgery group ( $P = 0,119$ ). There were no significant difference comparing proportions of type of surgery in EVLA and surgery groups: 75,5% vs 83% had GSV procedure, 18,4% vs 13,5% had SSV procedure, 6,1% vs 3,5% had both GSV and SSV procedure, respectively.

There were 51,7% of EVLA and 12,3% of surgery patients with C2 clinical class ( $P < 0,001$ ), 29,3% vs 58,8% with C3 class, respectively ( $P < 0,001$ ). Differences among other classes were not significant (EVLA vs surgery: C4 – 14,3% vs 22,9%; C5 – 2,7% vs 4,1%; C6 – 2% vs 2,4%).

To assess disease-specific QoL we successfully contacted 101 EVLA and 120 surgery group patients. QoL at 6 weeks was significantly better in EVLA group (median AVVQ scores – 3,22 (2,1-8,4) vs 9,17 (6,3-15,2),  $P < 0,001$ ). Conversely, at 1 year AVVQ scores were better in surgery group (3,1 (0-7,4) vs 0 (0-3,2),  $P = 0,012$ ). 2 years after treatment AVVQ scores in surgery group were also superior (2,7 (0,3-7,6) vs 1 (0-4,3),  $P = 0,023$ ).

At 2 years 84,8% of EVLA and 95% of surgery group patients stated that they would have same treatment again if necessary or recommend it to a friend ( $P = 0,283$ ).

At 1 year clinical recurrence was seen in 17,6% of EVLA and in 30% of surgery group patients ( $P = 0,217$ ). Recurrence rates at 2 years: 36,4% vs 37,5%, respectively ( $P = 0,92$ ).

## Conclusions

1. There were no statistically significant difference between age, BMI, sex distribution and proportion of type of surgery (GSV, SSV or both) in EVLA and surgery group patients.
2. Compared to surgery group, there was a significantly higher percent of C2 class patients in EVLA group. On the contrary, there was a significantly lower proportion of C3 disease in EVLA patients.
3. Compared to surgery group, a disease-specific QoL was significantly better in EVLA group at 6 weeks but significantly worse at 1 year and 2 years after the treatment.
4. There were no statistically significant difference in patients' overall satisfaction 2 years after EVLA or surgery treatment.
5. There were no statistically significant difference in recurrence rates 1 year and 2 years after EVLA and surgery.

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# EVALUATION OF HEALTH STATUS AND QUALITY OF LIFE OF PATIENTS WITH PROSTATE CANCER AFTER BRACHYTHERAPY, RADICAL PROSTATECTOMY AND EXTERNAL BEAM RADIATION THERAPY

*Kristijonas Jokūbonis, Kristina Norkaitytė, Jolanta Gribauskaitė*

*Supervisor of the abstract: Kęstutis Vaičiūnas*

*Department of Urology, Hospital of Lithuanian University of Health Sciences, Lithuania*

## **Introduction**

Expanded prostate index composite (EPIC) questionnaire is a comprehensive instrument developed to measure health related quality of life among men with prostate cancer. It has been validated in men with localized prostate cancer who underwent surgery, external beam radiation therapy (ERBT), or low dose rate (LDR) prostate brachytherapy with I-125 sources without the use of hormonal therapy. This questionnaire is designed for assessing treatment related problems bothering the patients. The quality of life index (QLI) added to International Prostate Symptom Score (I-PSS) is a questionnaire to assess urination symptoms. EQ – VAS (angl. EuroQol – visual analogue scale) – is a part of EQ – D5 questionnaire which records the respondent's self-rated health at the time of filling the questionnaire.

## **Aim**

To compare health status, quality of life and state of urinary, bowel, sexual and hormonal systems after different treatment methods of prostate cancer: LDR brachytherapy, radical prostatectomy and ERBT.

## **Objectives**

1. To calculate, evaluate and compare patients' complaints by different domains (urinary and bowel) after I-125 sources prostate brachytherapy, radical prostatectomy and external beam radiation.
2. To compare patients' sexual and hormonal complaints after different treatment methods of prostate cancer.
3. To compare quality of life index associated with urination of patients after LDR brachytherapy, radical prostatectomy and external beam radiation therapy.
4. To compare health status of patients by visual analogue scale (EQ – VAS) after brachytherapy, radical prostatectomy and ERBT.

## **Methods**

We included men with localized prostate cancer who underwent surgery, external beam radiation therapy (ERBT), or low dose rate (LDR) prostate brachytherapy. Patients filled EPIC questionnaire in the outpatient department during a visit to urologist. 35 questionnaires from each group were randomly selected for further analysis. Average age of patients who underwent LDR brachytherapy was  $62.3 \pm 8.8$  years; after radical prostatectomy -  $62.5 \pm 6.2$  years; after radiation therapy -  $68.4 \pm 4.8$  years. Quality of life was evaluated using the EPIC questionnaire consisting of 50 questions divided into four summary domains (urinary, bowel, sexual and hormonal). Urinary domain summary scores were divided into four parts: Function, Bother, Incontinence and Irritative/Obstructive subscales. Bowel, Sexual and Hormonal domain summary scores were divided into two parts: Function and Bother subscales. Response to EPIC questionnaire: 0% to 25% was evaluated as bad, from 25% to 50% - average, from 50% to 75% - well and from 75% to 100% - very good. Subgroups were evaluated by the same procedure. Patients were also interviewed by IPSS and quality of life associated with urination questionnaires and quality of life index was calculated. Men's health status after prostate cancer treatment has been set on the basis of the EQ - VAS's filled on a visit day (on a scale from 0 to 100). Statistical analysis was performed using "SPSS v17.0" package. Kruskal-Wallis test was used and statistically significant difference was at  $p < 0,05$ .

## **Results**

In response to the EPIC questionnaire patients after prostate cancer LDR brachytherapy evaluated their urinary system generally  $80.1 \pm 18.3\%$ , urinary function -  $88.3 \pm 18.3\%$ , bother -  $74.7 \pm 19.9\%$ , irritation/obstruction  $79.5 \pm 17.5\%$  and

urinary incontinence -  $84.7 \pm 23.4\%$ , respectively, after radical prostatectomy:  $78.5 \pm 18.6\%$ ,  $82.9\% \pm 18.7$ ,  $75.7 \pm 21.0\%$ ,  $81.9\% \pm 16.8$ ,  $76.4 \pm 24.5\%$ , and after ERBT:  $82.9 \pm 15.3\%$ ,  $90.6\% \pm 14.9$ ,  $78.7 \pm 17.1\%$ ,  $81.2\% \pm 17.8$ ,  $89.1 \pm 16.0\%$ .

Generally bowel system after brachytherapy was estimated  $88.8 \pm 9.9\%$ , its function -  $90.3 \pm 10.23\%$ , both -  $88.8 \pm 11.8\%$ . After radical prostatectomy - respectively:  $89.9 \pm 10.5\%$ ,  $86.8\% \pm 12.7$ ,  $92.6 \pm 12.0\%$ . Bowel system after external beam radiation therapy - respectively:  $85.6 \pm 17.7\%$ ,  $83.0\% \pm 13.9$  and  $87.3 \pm 19.0\%$ .

Hormonal system after brachytherapy was estimated generally by  $91.0 \pm 13.8\%$ , its function -  $91.8 \pm 13.6\%$ , both -  $90.3 \pm 15.1\%$ . After radical prostatectomy, hormonal system was evaluated respectively:  $87.7\% \pm 14.3$ ,  $85.2 \pm 17.2\%$  and  $88.5 \pm 14.1\%$ , and after external beam radiation therapy:  $81.4 \pm 17.3\%$ ,  $77.0\% \pm 21.6$  and  $82.2 \pm 19.8\%$ . Between the three treatment groups statistically significant difference was detected in hormonal function ( $p < 0.05$ ).

The overall rating of the sexual domain after LDR brachytherapy -  $37.0 \pm 29.3\%$ , its function -  $34.18 \pm 30.97\%$ , both -  $45.0 \pm 35.8\%$ . Meanwhile, after a radical prostatectomy, respectively:  $20.8 \pm 18.3\%$ ,  $14.0 \pm 19.2\%$  and  $38.7 \pm 38.7\%$ , and after external beam radiation therapy:  $23.9 \pm 23.6\%$ ,  $14.2\% \pm 22.6$  and  $41.4 \pm 37.2\%$  respectively. Between the treatment groups statistically significant difference was noted in sexual function ( $p = 0.011$ ).

Most of patients answered that quality of life index associated with urination after different treatment methods were mostly good, good or very good (LDR brachytherapy - 80%, radical prostatectomy - 74,3% and ERBT - 69,7%) and not different between treatment groups ( $p = 0.62$ ).

In response to a question from the EQ - VAS questionnaire about the overall health status, patients after brachytherapy evaluated their health by  $76.9 \pm 17.6$  points, and after radical prostatectomy -  $66.3 \pm 21.5$  ( $p = 0.032$ ). Patients after external beam radiation therapy evaluated their health status -  $67.6 \pm 21.6$  points. There was no statistically significant difference between external beam radiation therapy and brachytherapy groups ( $p = 0.061$ ) and between radical prostatectomy and external beam radiation therapy groups ( $p = 0.061$ ).

## Conclusions

1. After all prostate cancer treatment methods patients evaluated their urinary and bowel systems as "very good".
2. General evaluation of hormonal system was "very good" and the sexual system – "average". The best rating of sexual function was in prostate cancer treatment with LDR brachytherapy group. Hormonal function best rated by patients after brachytherapy, in second place - radical prostatectomy, the third – external beam radiation therapy.
3. Quality of life index did not differ after three prostate cancer treatment methods. Their quality of life index associated with urination was evaluated as "very good".
4. The general health status was better after LDR brachytherapy than after radical prostatectomy or external beam radiation therapy.

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## OMPHALOCELE: PRENATAL DIAGNOSIS, NEWBORN MANAGEMENT AND LONG-TERM OUTCOMES

*Jūratė Baltrūnaitė*

*Supervisor of the abstract: Pranas Gurskas, Kęstutis Trainavičius*

*Children's Surgery Centre, Children's Hospital, Affiliate of Vilnius University Hospital Santariskiu Klinikos; Vilnius University Faculty of Medicine, Lithuania*

## Introduction

Although omphalocele is one of the most common congenital abdominal wall defects, still it is a dramatic case in neonatology posing a challenge to paediatric surgeons, as well. The study is important for future health care

specialists to get acquainted with current management of this pathology and long-term outcomes after particular surgical intervention.

### **Aim**

To present the analysis on the diagnosis, management and long-term outcomes of patients with omphalocele.

### **Objectives**

Define the ways of prenatal diagnosis, critical points in newborn management and current surgical modalities by analysing the data of paediatric patients treated for omphalocele at our hospital and comparing it with the literature. Create and apply a questionnaire on general health and postoperative factors to identify long-term outcomes.

### **Methods**

A retrospective, single-centre review of all newborns diagnosed with omphalocele was conducted. 8 patients admitted to Vilnius University Hospital Santariskiu Klinikos neonatal intensive care unit between 2005 and 2014 were included. Identification of patients was performed using ICD-10 code (Q79.2) from the hospitals administrative electronic database or manually from hospital records and surgical notes. The data was analysed for the following variables i.e. gestational age, sex, pregnancy risk factors, prenatal ultrasonography, clinical features, postnatal physical, laboratory and instrumental examination results, associated anomalies, size of omphalocele, operative findings and methods. The questionnaire was created for this study at our hospital to analyze the long-term outcomes of patients treated for omphalocele. Questionnaires were completed via telephone or email interview by parents of former patients. Statistical analysis was performed using MS Excel.

### **Results**

There were 8 patients included in the study: all male newborns (100%). 75% of patients had comorbidities, such as hipospadia, cryptorchidism, inguinal hernia, congenital heart disease, congenital paratrophy or hypotrophy, ankyloglossia, C1 (atlas) spine injury, intraventricular hemorrhage and congenital infection. One (12.5%) patient was diagnosed with neonatal abstinence syndrome due to maternal use of addictive substances during pregnancy. 6 out of 8 mothers (75%) had 1 or more risk factors during pregnancy for complications: upper respiratory (25%) or genitourinary tract infection (25%), preeclampsia (12.5%), gestational (12.5%) or type 2 (12.5%) diabetes, high blood pressure (12.5%), obesity (12.5%) and anaemia (12.5%), tobacco and heroin usage (12.5%), adolescence (12.5%) or age > 35 years (25%). All patients except one were full term (87.5%). 6 fetuses were diagnosed with omphalocele using ultrasound (75%) from 15th gestational week. There were no chromosomal abnormalities detected. 5 neonates (62.5%) had minor/ medium and 3 (37.5%) – giant omphaloceles. 5 patients (62.5%) underwent primary abdominal wall closure, 1 (12.5%) had Gross operation for omphalocele performed, 1 (12.5%) – staged surgery using silicone plastic “silo” plus closure with silastic patch for 1 patient (12.5%). 5 infants (62.5%) had an uneventful postoperative period, 1 (12.5%) – suffered from apnoea episodes with tonic seizures for 2 days, 1 – developed hypotension and anaemia, inferior vena cava syndrome was suspected for 1 patient with minimal bowel wall microcirculation after soon closure of giant omphalocele, as well. The average hospital stay was  $24.3 \pm 16.5$  days (11–61). 6 patients (75%) recovered fully, 2 – had ventral hernia. There were 57% of completed questionnaires by the parents of our patients. 75% of respondents indicated no change in state of child’s health, good and very good quality of life, small or well hidden in the umbilicus scar. 1 patient underwent ventral hernia repair.

### **Conclusions**

Ultrasound proved to be the most helpful method for the detection of omphalocele at early stages during pregnancy (75%). Planning prenatal and postnatal multidisciplinary care in a tertiary center is considered as the main step in newborn with omphalocele management. The most often used surgical technique was primary abdominal wall closure (62.5%). Primary, staged or delayed surgery should never be hurried and unweighed. Most infants with minor or giant omphaloceles had good long-term outcomes (75% of respondents). Therefore, prognosis is mainly related to the number and severity of associated structural and chromosomal abnormalities.

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## OSTEOSYNTHESIS OF THE CLAVICLE AFTER OSTEOTOMY IN BRACHIAL PLEXUS SURGERY: A BIOMECHANICAL CADAVER STUDY

*Edgaras Žarskis, Mantas Vilčinskis*

*Supervisor of the abstract: Egidijus Kontautas*

*Department of Orthopaedics and Traumatology, LSMU, Lithuania*

### Introduction

Brachial plexus lesions are often shocking injuries accompanied by severe long term functional disability and psychological distress (1,2). The brachial plexus surgery consist of exploration of this anatomic structure, intraoperative nerve monitoring and thorough reconstruction (1-4). Adequate exposure is essential for brachial plexus surgery success (2-5). A number of different approaches for the brachial plexus exploration are described in the scientific literature (1-5). However, authors express different opinions on the necessity of clavicle osteotomy (1-5). Profuse bleeding from under the clavicle, upper trunk or supraclavicular lesion, retroclavicular stretch injuries of the brachial plexus are situations when the clavicular osteotomy is recommended (2-4). Perceptions of biomechanical properties of the clavicle osteosynthesis encourage not hesitate to osteotomize this bone which facilitates exposure and decreases surgical time in brachial plexus surgery (4).

### Aim

The aim of this study is to evaluate and compare biomechanical effects of reconstruction locking plate superior and anteroinferior positioning on the osteosynthesis of the clavicles osteotomized obliquely.

### Objectives

To evaluate and compare the biomechanical stability and stiffness of locking plate superior and anteroinferior positioning on the osteosynthesis of the clavicles osteotomized obliquely.

## Methods

Ten matched pairs of fresh cadaveric clavicles osteotomized through the mid-shaft obliquely were repaired with a titanium 7-hole 3.5-mm reconstruction locking plate in the superior or the anteroinferior position (6-10). The maximal failure loads and the displacement of the specimens at 166 N, 183 N, 203 N loads were recorded by the machine in three-point cantilever bending (6-10). Bending failure stiffness was calculated between 10 - 150 N and 151 N to maximal bending failure loads (6-10). All data were grouped by location of the RLP for descriptive statistics. The statistical analysis was performed by Mann-Whitney U, Wilcoxon, Fisher's exact tests. The statistical power ( $sp$ ) of the study ( $1-\beta$ ) was calculated in order to avoid a Type II error when the experimental data failed to show differences between osteosynthesis methods. The significance level ( $\alpha$ ) and false negative rate ( $\beta$ ) have been set at 0.05 and 0.2 respectively.

## Results

Mean maximal failure load was 396.2 (SD, 117.3) N for superior constructs and 220.1 (SD 51.1) N for anteroinferior one ( $p < 0.05$ ). There was significant difference in displacement between superior and anteroinferior plated specimens at 183 N (6.3 (SD, 2) vs 9.9 (SD, 3.6)) and 203 N (6.4 (SD, 0.6) vs 11.7 (SD, 6.6)) loads ( $p < 0.05$ ). Mean bending failure stiffness between 151 N and maximal loads was 22.6 (SD, 13.2) N/mm for superior plates and 11(SD, 9) N/mm for anteroinferior plated clavicles ( $p < 0.05$ ).

## Conclusions

The superior plating of obliquely osteotomized clavicles with the titanium 7-hole 3.5-mm locking reconstruction plate had a significantly greater biomechanical stability at fixed loads of 183 N and 203 N than the anteroinferior plating in the inferior directed cantilever bending. The superior plating osteosynthesis exhibited a significantly greater stiffness from 151 N to maximal bending failure loads, also. In clinical practise this scientific work shows biomechanical stability of metal constructions and allows to prognose results in vivo

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# PEDIATRIC TRAUMA: MECHANISM OF INJURY, PHYSICAL EXAMINATION AND PLAIN FILM IMAGING

*Vaidotas Galaunė, Karolis Zokas*

*Supervisor of the abstract: Saulius Rutkauskas*

*LSMU, Lithuania*

## **Introduction**

There are major anatomic and physiologic differences in the pediatric and adult patients, that play a significant role in the evaluation and management of the pediatric trauma patient [1]. Imaging of skeletal trauma is dominated by plain film radiology. Plain film offers excellent evaluation of small or simple anatomy, and provides a first step in imaging more complex anatomy, to be followed by more sophisticated modalities [2]. Nevertheless, the increased amount of plain films is associated with higher radiation exposure.

## **Aim**

To determine the relationship between mechanism of injury, physical examination and findings in plain films in pediatric trauma patients.

## **Objectives**

1. Identify the most frequent trauma mechanism in the study cohort.
2. Determine the association between trauma mechanism, physical examination and number of plain films.
3. Determine the association between the number of pathological findings obtained during physical examination and the amount of pathological plain films.

## **Methods**

1. Retrospective analysis of pediatric trauma patients' case histories, who were admitted to Kaunas Clinic of Lithuanian Health University of Sciences (KK LHUS) Pediatric emergency department from 2013.01.01 to 2013.12.31, was done.
2. Study inclusion criteria: traumatic injury, the number of performed plain films is equal or higher than 5 for each person.
3. The patients were divided into groups according to their gender, age and trauma mechanism (traffic accident, physical abuse, domestic accident, trauma of unknown mechanism). Trauma mechanism categories were based on protocol implemented by KK LHUS.
4. Pathological findings observed during physical examination and in plain films were attributed to six anatomical regions: head; cervical spine, remaining spine (thoracic, lumbar, sacral regions), thorax, pelvis, upper limb and lower limb.
5. All pathological findings observed during physical examination were considered as an indication for radiography study.
6. Statistical analysis of the data was performed using SPSS 20.0 software. Mann-Whitney, Wilcoxon tests were used to compare medians, with the standard level of the first type of mistake alpha (0,05).

## **Results**

The study cohort consisted of 315 patients, 120 (38,1 pct.) of them were girls, 195(61,9 pct.) were boys, 189 (60 pct.) of them were admitted to the pediatric emergency department after a domestic accident, 103 (32,7 pct.) after a traffic accident, 20 (6,3 pct.) after physical abuse, 3 (1,0 pct.) after suffering a trauma of unknown cause. The mean number of plain films performed for a patient was  $7,4 \pm 2,7$ . The number of pathological regions observed during physical examination was equal between traffic accident group (median 1; min- 0; max-5) and domestic accident group (median 1; min-0; max-6) ( $p < 0,05$ ). The traffic accident group had the highest number of plain films per person (median 8, min-5; max-16) compared to physical abuse group (median 6, min-5, max-16) and domestic accident group

(median 6, min-5; max-18) ( $p < 0,05$ ). The number of plain films with pathological findings was equal between traffic accident group (median 0, min-0; max-2) and domestic accident group (median 0, min-0; max-2). The number of pathological regions observed during physical examination was significantly higher than the number of pathological plain films in all trauma groups ( $p < 0,05$ ). Only 2 patients had more pathological plain films than pathological regions observed during physical examination, one in each group of traffic accident and domestic accident.

### Conclusions

1. The majority of traumas occurred during domestic accidents.
2. Despite the fact that traffic accident and domestic accident victims had the same number of pathological regions observed during physical examination, the number of performed plain films was higher among traffic accident victims.
3. Most of the pathological regions observed during physical examination did not present any pathological data in the plain films.

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## PROPERTIES OF CHILDREN CLAVICLE AND HUMERUS INJURIES ACCORDING TO THEIR TYPE, LOCALIZATION AND INJURY MECHANISM

*Agnė Pupelytė, Julius Rakickas*

*Supervisor of the abstract: Ramunė Degliūtė-Muller  
Orthopaedy-traumatology, Lithuania*

### Introduction

The increasing amount of injury amongst children is raising awareness. In Lithuania, injury are the main health issue amongst children and teenagers. The rapid pace of life, increased activities, independence, leads to always growing numbers of children injury. The most common injury are bone fractures. Out of all bone fractures 13,6 percent are clavicle and humerus fractures. The understanding of injury mechanics, and their distribution amongst gender is very important for prevention of such injuries.

### Aim

To analyze and evaluate children clavicle and humerus injury properties according to type, localization and injury mechanism.

### Objectives

1. To find out the most common clavicle and humerus injury amongst children who are being treated in the hospital.
2. To find out the most common clavicle and humerus injury mechanisms and distribution.
3. To find out which parts of humerus fracture most often.

### Methods

Retrospective analysis of 377 patients, who were treated of clavicle and humerus injury in LSMU KK Children chirurgy department othopaedic-traumatology sector during years 2009 – 2014 was done. Patients were categorized by injury types to four groups: humerus fractures, humerus dislocation, clavicle fractures, clavicle dislocation. Patients categorized by gender. Patients were grouped into five groups according to the injury mechanism: household injury; injury in schools and kindergartens; sport related injury - that happened in sport schools, during sport events; injury

that occurred during leisure time - during active or passive leisure time; traffic accident injury. Patients who have suffered humerus fractures were grouped into three groups by the anatomical area of fracture: proximal, shaft and distal. The average age of patients who have suffered humerus injury was calculated. Data was processed using the descriptive statistical method and presented as real numbers and percentages. The statistical analysis was performed using a standard statistical package SPSS 19,0 and Microsoft Excel 2013. The selected statistical level of trust was  $p < 0,05$ .

## Results

There were 377 patients in the research group 163 (43,24 pct.) were female, 214 (57,76 pct.) were male. The female to male ratio - 1:1.3. Clavicle and humerus injury distribution: left humerus dislocation- 44 (11,67 pct.). Right humerus dislocation – 26 (6,9 pct.). Left humerus fractures-181 (48,01 pct.). Right humerus fractures-112 (28,87 pct.). Left clavicle dislocation- 12 (3,18 pct.). There were no right clavicle dislocations. Left clavicle fractures – 1 (0,27 pct.), right clavicle fractures – 1 (0,27 pct.). Statistically there is evident difference between injury distribution ( $p < 0.001$ ). Leisure time injuries were experienced by 178 (47,21 pct.) patients. 76 (42,7 pct.) females, and 102 (57,3 pct.) males ( $p < 0.001$ ). Household injuries were experienced by 142 (37,67 pct) patients. 70 (49,3 pct.) females, and 72 (50,7 pct.) males ( $p < 0.001$ ). Sport related injuries were experienced by 26 (6,9 pct.) patients. 5 (19,23 pct.) females, and 21 (80,77 pct.) males ( $p < 0.001$ ). School injuries were experienced by 20 (5,31 pct.) patients. 8 (40 pct.) females, and 12 (60 pct.) males ( $p < 0.001$ ). Traffic accident injuries were experienced by 11 (2,92 pct.) patients. 4(36,36 pct.) females, and 7 (63,64 pct.) males ( $p < 0.01$ ). Statistically there is evident difference between injury mechanisms ( $p < 0.001$ ). Humerus injury distribution: proximal – 43 (14,67 pct.) fractures; shaft – 98 (33,45 pct.) fractures; distal – 152 (51,88 pct.) fractures ( $p < 0.001$ ). Left and right humerus fractures distributed accordingly: 181 (61,77 pct.) and 122 (38,23 pct.) ( $p < 0.001$ ). The average age for patients with humerus dislocation is 7,7 years. The average age for patients with humerus fracture is – 9,1 years.

## Conclusions

1. The most common humerus injuries amongst children who were treated in hospital department were: fractures – in 82,77 pct. of patients; dislocations – in 17,23 pct. of patients. The most common clavicle injuries amongst children who were treated in hospital department were: fractures – in 14,29 pct. of patients; dislocations – in 85,71 pct. of patients. Statistically there is evident difference between injury distribution ( $p < 0.001$ ).
2. Leisure time injuries occur more often than injuries in household, school-kindergartens, sport events and traffic accidents ( $p < 0.001$ ).
3. Fractures of distal humerus occur more often than proximal humerus fractures ( $p < 0.001$ ).

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# RELATION BETWEEN MULTIPLE RENAL ARTERIES AND RENAL NEOPLASM

*Aistė Matulevičiūtė, Antanas Montvila*

*Supervisor of the abstract: Ramūnas Mickevičius*

*Department of Radiology, LSMU, Lithuania*

## Introduction

Renal cell carcinoma (RCC) is the most common malignant tumor of the kidney, accounting for 85–90% of adult malignant renal tumors. Other types of kidney tumors are rare. Performing the surgery it was noticed that multiple renal arteries occasionally feed renal neoplasms. It is important that the number of renal arteries feeding the healthy kidney usually is not evaluated during the operation. Due to the lack of publications it was decided to appraise the effect of the number of renal arteries in the developing of renal neoplasm. CT with a dynamic contrast enhancement protocol is an accurate method for the preoperative evaluation of renal neoplasm.

## Aim

To evaluate the relation between multiple renal arteries and the development of renal neoplasm using computed tomography angiography (CTA).

## Objectives

1. To evaluate the correlation between the number of renal arteries originating from aorta to the kidney and the development of RCC.
2. To evaluate the correlation between the number of renal arteries arising from aorta to the kidney and the development of renal benign tumors.
3. To compare the results between the groups with RCC and with renal benign tumors.

## Methods

378 patients who were diagnosed with renal neoplasms in the last four years were investigated and 243 patients matched the criteria: 231 RCC and 12 renal oncocytomas were histologically confirmed. Patients without CT scan images or with neoplasms in both kidneys were excluded.

The CT scan images of the patients diagnosed with renal neoplasms were evaluated repeatedly by the research group. The number of renal arteries originating from the abdominal aorta to the kidney with renal neoplasm and to the healthy kidney were recorded and compared. The correlation between the number of renal arteries and the development of renal tumors were evaluated. Statistical analysis was performed using the IBM SPSS 20.0 software package (SPSS Inc., Chicago, IL, USA). McNemar's and Pearson's chi square tests were used to evaluate the prevalence rates of multiple renal arteries in the right and left kidneys. A  $p$  – value  $<0.05$  was considered statistically significant.

## Results

Cases of 243 patients with neoplasm were examined. There were 231 (95,1%) patients with RCC and 12 (4,9%) with renal oncocytomas (104 women and 139 men; age range 31-90 years; mean  $\pm$  SD;  $63,56 \pm 11,15$  years). Comparing the side of the kidney affected by RCC, it was found 103 (42,4%) tumors in the left and 128 (52,7%) in the right side respectively. Comparing the side of the kidney affected by renal oncocytoma, it was found 4 (1,6%) neoplasms in the left and 8 (3,3%) in the right side respectively.

Among 231 patients with RCC, 50 (21,6%) patients had multiple renal arteries on the side affected by RCC and 49 (21,21%) patients had multiple renal arteries on the healthy side. There was no significant difference between the number of renal arteries on the side affected by RCC and healthy side ( $p = 0,69$ ; McNemar's test).

Among 12 patients with renal oncocytomas, 1 (0,08%) patient had multiple renal arteries to the both kidneys (affected by renal oncocytoma and healthy). There was no significant difference between a number of renal arteries on the side affected by renal oncocytoma and healthy side ( $p = 0,5$ ; McNemar's test) the result might be affected by the small amount of cases in this study group.

There was no significant difference between the number of renal arteries in the kidney with renal oncocytoma and RCC ( $p = 0,71$ ; Pearson's chi square test).

### Conclusions

1. The number of renal arteries originating from aorta has no impact to the development of RCC.
2. The number of renal arteries arising from aorta has no impact to the development of renal benign tumors.
3. There is no difference comparing the number of arteries feeding kidney with RCC and renal benign tumors.

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## REPEATED ANTERIOR CRUCIATE LIGAMENT INJURIES DEPENDENCE ON SEX, THE MOST COMMON TYPES OF INJURIES AND TRANSPLANTS USED FOR LIGAMENT RECONSTRUCTION

*Eimantas Spitrys, Tomas Kadusauskas*

*Supervisor of the abstract: Rimtautas Gudas*

*LSMU, Lithuania*

### Introduction

Anterior cruciate knee ligaments are very important for normal knee movements and knee joint stability. They are the most commonly injured ligaments, especially among athletes. They can be injured during the contact when the mechanism of injury is a direct impact to the knee joint or non-contact way. Most violations occur during non-contact injuries: quick stop during running or changing direction, landing after a jump or sharp turns. During this study we are going to analyze what type of traumas most commonly causes primary and repeated ligament injuries, what transplants and their diameters were used during reconstruction operations, repeated injuries depending on sex and knee side.

### Aim

Analyze patients who had revision surgery because of repeated knee anterior cruciate ligament injuries and their dependence on sex, most commonly used transplants and their diameters, their differences between primary and revision surgery, find out whether there is a statistically significant difference between the frequency of repeated injuries and the side of the knee.

### Objectives

1. Select patients who have had repeated cruciate knee ligament injury and revision surgery.
2. Divide patients into groups by sex and injury side.
3. Calculate the average age of the patients studied.
4. Identify the most commonly used transplants, their average diameters and their difference used in primary and revision surgeries.
5. Determine primary and secondary causes of injury, trauma type contact or non-contact.
6. Perform statistical analysis and find out whether there are significant differences in repeated ligament injuries

among women and men, and which side, left or right is more frequently injured. Find out what injuries types contact or non-contact occurs more frequently and whether there is a statistically significant difference between the diameter difference in transplants between men and women.

## Methods

During this study a retrospective analysis of repeated anterior knee ligament rupture reconstructive operations performed at LSMU Kaunas Clinics hospital Orthopedics - Traumatology department was done using computer databases and surgeries logbook data. Also data from patients medical records and collected data from other hospitals about primary anterior cruciate knee ligament reconstruction was used. Some of information was missing so patients were contacted to clarify the missing data. Patients were divided into two groups according to gender also according to injury side, left or right. Analyzed what injury types contact or non-contact occurs more frequently, what types of ligament transplants were used during primary and revision surgery and diameter difference of transplants used during primary and revision surgeries between men and women. Calculated average age of the patients studied and its standard deviation. Statistical analysis was performed using a standard statistical package SPSS for Windows 21.0. chi square and Mann-Whitney statistical criteria were used for analysis, the chosen level of significance  $p < 0.05$

## Results

1. 103 knee ligament revision surgery cases were analyzed. The female were 23.3% ( $n = 24$ ), male - 76.7% ( $n = 79$ ) of cases. Using the non parametric chi square test it was established that men had knee cruciate ligament re-rupture significantly more often than women ( $p < 0.001$ ).
2. Initial trauma causes 91.3% ( $n = 94$ ) of cases were non-contact and 8.7% ( $n = 9$ ) were contact. Re-rupture trauma causes 85.4% ( $n = 88$ ) were non-contact, 14.6% ( $n = 15$ ) contact.
3. Left side lesions were 43.7% ( $n = 45$ ) of cases and right 56.3% ( $n = 58$ ) of cases. Using the non parametric chi square test it was established that the injury sides distribution difference was not statistically significant  $p > 0.05$  ( $p = 0.2$ ).
4. Primary knee cruciate ligament reconstructive surgery was made with: proprium patella ligament 22.3% ( $n = 23$ ) and semitendinosus-gracilis tendon 77.7% ( $n = 80$ ). Revision surgery: 72.8% ( $n = 75$ ) of cases with proprium patella ligament, 20.4% ( $n = 21$ ) semitendinosus-gracilis tendon and 6.8% ( $n = 7$ ) other transplants were used for reconstruction. Using the non parametric chi square test it was established that primary ligament reconstructive surgery was performed statistically significantly more frequently with semitendinosus-gracilis tendon and revision surgery with proprium patella ligament ( $p < 0.001$ ).
5. The average transplants diameters used during primary cruciate ligament reconstructive surgery: Semitendinosus - gracilis tendon  $7.98 \pm 0.62$  mm, proprium patella ligament  $8.34 \pm 1.17$  mm. During revision surgery: semitendinosus-gracilis tendon  $8.78 \pm 1.27$  mm, proprium patella ligament  $10.11 \pm 0.85$  mm, other transplants  $9.42 \pm 0.78$  mm. Average difference of transplants diameters between the primary and revision reconstructive surgeries was  $1.73 \pm 1.39$  mm. Using the Mann-Whitney statistical criteria the diameters difference between men and women was compared and no statistically significant differences were found. ( $p > 0.05$   $p = 0.32$ ).
6. The average age of patients was  $33.3 \pm 13.10$ .

## Conclusions

1. Knee anterior cruciate ligament re-rupture was more common among men.
2. Primary and secondary cruciate ligament ruptures happened more often during non-contact than contact injury.
3. No statistically significant difference between the sides of injury was found, both left and right violations occur at the same rate.
4. Most commonly used transplant for the first cruciate ligament reconstruction was semitendinosus - gracilis tendon. After first transplant rupture, for revision most commonly used transplant was patella proprium ligament.
5. During revision surgeries average  $1.73 \pm 1.39$  mm thicker transplants were used compared to primary reconstruction surgery.
6. Average age of studied patients was 33 years.

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## RESISTANCE OF MAIN BRONCHIAL STUMP USING VICRYL AND PROLENE SUTURES: AN EXPERIMENTAL STUDY ON PIG TRACHEA

*Vytenis Keturakis, Tomas Ptašinskas, Domantas Balsys*

*Supervisor of the abstract: Romaldas Rubikas, Arslan Mamedov*

*Department of Cardiac, Thoracic and Vascular Surgery, LSMU, Lithuania*

### Introduction

Pneumonectomy is a radical surgical treatment of the lung cancer. Proper and sufficient closure of the main bronchial stump after pneumonectomy is the most important factor that determines the outcome, complications and morbidity in a postoperational period. Brochopleural fistula is one of the main and one of the most serious complication. It is estimated that the rate of bronchopleural fistula (BPF) is 6,61% of all patients who had a pneumonectomy[3]. BPF presence increases mortality by 40%[3]. There are many techniques how to close the bronchial stump, some surgeons use staplers, others prefer manual suturing.

### Aim

To assess the eligibility of two different sutures and two different suturing techniques for a sufficient biomechanical closure of bronchial stump by forming a main bronchial stump and applying an even air pressure.

### Objectives

1. To determine whether vicryl 2/0 or prolene 2/0 sutures are more eligible to form a biomechanically sufficient bronchial stump by applying an even pressure.
2. To explore whether over and over continuous or over and over interrupted suturing technique are better to form a biomechanically sufficient bronchial stump by applying an even air pressure.
3. To determine whether this study are thorough enough to clarify the best suturing technique to form a biomechanically sufficient bronchial stump.

### Methods

This was an experimental study. Permission was given by Bioethics center (approval Nr. BEC-MF-43). 200 tracheae were taken from the local slaughterhouse. All the slaughtered pigs weighted >80 kg and were of similar age. Tracheae were already prepared in the slaughterhouse and maintained in the refrigerator, with a temperature set at +4oC., we evaluated every tracheae and emmited those, which were different from the others or damaged (40 tracheae were damaged or were different). 160 tracheae were grouped randomly in 4 groups – every group accounted 40 tracheae. Larynx was removed, trying not to cut main bronchi. The left main bronchus was closed with a clamp. All of the sutures were same at thickness – 2/0, prolene and vicryl. Suturing techniques in groups used to suture right bronchus were over and over – continuous – with a space every 3-4 mm (vicryl; prolene) and over and over interrupted also with a space every 3-4 mm (vicryl; prolene). After that we used a sphygmomanometer connected with a standart intubation tube and a cuff to apply air pressure. Specimens were submerged into the +19oC distilled water and by slowly increasing air pressure the moment, when the air leakage occurred, was monitored and recorded with a 5mmHg

deviation. Statistical analysis was performed using SPSS statistics 22. The means were compared using Student t test method with standart error of the mean. Statistically significant values were considered, when  $p < 0.05$ .

## Results

Difference of mean pressure between interrupted prolene 2/0 suture group 47,23+ 19,53 and continuous prolene 2/0 suture group 47,15 + 19,50 ( $p = 0,987$  not statistically significant). Difference of mean pressure between interrupted vicryl 2/0 suture group 41,75+ 20,27 and continuous vicryl 2/0 suture group 49,25 + 26,26 ( $p = 0,343$  not statistically significant). Difference of mean pressure between interrupted prolene 2/0 suture group 45,66+ 19,65 and interrupted vicryl 2/0 suture group 41,75 + 20,27 ( $p = 0,230$  not statistically significant). Difference of mean pressure between continuous prolene 2/0 suture 45,153 + 19,50 and continuous vicryl 2/0 suture 48,84 + 25,33 ( $p = 0,796$  not statistically significant). Mean pressure between interrupted prolene 2/0 suture 47,88+ 19,43 and continuous vicryl 2/0 suture 48,4 ( $p = 0,913$  not statistically significant).

## Conclusions

1. There were no statistically significant difference between vicryl 2/0 and prolene 2/0 sutures eligibility to form a sufficient bronchial stump – both sutures had similar biomechanical resistance values.
2. There were no statistically significant difference between over and over continuous or over and over interrupted suturing technique to form a sufficient bronchial stump – both techniques were similar in their ability to form a biomechanically sufficient bronchial stump.
3. Notwithstanding our study results, more detailed and sophisticated experiments in the future with dynamic air pressure, better suturing techniques should be conducted in order to determine the biomechanically best manual main bronchial stump closure technique.

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## REVIEW OF TOTAL HIP ARTHROPLASTY IN ALYTUS DISTRICT S.KUDIRKA HOSPITAL IN 2013

*Kristijonas Jokūbonis, Martynas Banys*

*Supervisor of the abstract: Arvydas Baublys*

*Department of Orthopedics and Traumatology, Alytus district S. Kudirka hospital, Lithuania*

### Introduction

Hip replacement surgery or total hip arthroplasty (THA) is considered as one of the most successful surgeries in the world. THA is usually indicated for senior people but over the last years, it was noticed, that more and more middle-aged people need THA. The main indications for hip replacement are hip joint osteoarthritis and femoral neck fracture. Each year, over 3000 hip replacement surgeries are performed in Lithuania. In this abstract, we review the main characteristics of hip replacement surgery in Alytus district hospital.

### Aim

To analyze the main treatment by total hip replacement characteristics (indications, types of prosthesis, duration of hospitalization, hemoglobin decrease during operation, blood loss during operation, duration of the operation and need for blood transfusion) in Alytus district S.Kudirka's hospital in 2013.

## Objectives

1. To determine the most common indications for total hip replacement
2. To determine the most common type of prosthesis fixation
3. To compare the level of hemoglobin before and after the operation
4. To determine blood loss during the operation and evaluate its link with the decrease of hemoglobin
5. To evaluate the link between blood loss and duration of the operation
6. To evaluate the link between blood loss and duration of hospitalization time
7. To evaluate the link between need for blood transfusion and blood loss
8. To evaluate the link between need for blood transfusion and change of hemoglobin.

## Methods

We have performed retrospective analysis of case histories of patients, who underwent total hip replacement in Alytus district S.Kudirka's hospital in 2013. We have analyzed patients' demographic parameters, Body Mass Index (BMI), antibacterial and pulmonary embolism prophylaxis, days spent in hospital, indications of treatment, types of prosthesis, hemoglobin levels, length of operation and blood loss. Statistical calculation was performed using "SPSS 17.0" statistical package, using Pearson correlation coefficient and Chi-square test; statistical significance was achieved when  $p < 0,05$ .

## Results

Out of 61 patients, who underwent THA, 20 were male and 41 female. 77% of the patients were 65 years old or above and 23% were younger than 65 (according to World Health Organization, people above 65 years old are considered as elderly). Average age of patients was  $68,5 \pm 10,26$  years, BMI  $28,84 \pm 5,62$ , duration of hospitalization was  $10,31 \pm 3,26$  days. All patients received single intravenous dose of cefuroxime before the surgery. Each patient once received fraxiparine two hours before surgery and once a day after the surgery, until they were released. After the surgery, graduated compression stockings were placed for each patient and removed when patients became fully ambulatory. The most common indication for THA was coxarthrosis – 50 cases (82%), 9 cases consisted of the femoral neck fracture (14.7%), 2 cases - loosening of prosthesis (3.3%). The most common type of prosthesis was cement prosthesis - 41 (67,2%), mechanical fixation was used 5 times (8,2%), 2 revisional inserts (3,3%). In 13 (21,3%) cases information about type of fixation was absent. Average level of hemoglobin before the surgery was  $137,43 \pm 14,55$  g/l, after –  $109,40 \pm 14,94$  g/l,  $p = 0.008$ . Average blood loss during the surgery -  $455,74 \pm 292,0$  ml, average hemoglobin level decrease was  $28,03 \pm 13,47$  ml. There is a significant positive relationship between blood loss and hemoglobin level decrease,  $r(59) = 0.304$ ,  $p = 0.017$ . Average duration of surgery was  $73,0 \pm 21,53$  min. There is a significant positive relationship between duration of surgery and blood loss,  $r(59) = 0.594$ ,  $p = 0.001$ . Average hospitalization time was  $10,31 \pm 3,26$  days. We have found a significantly positive relationship between blood loss and hospitalization time,  $r(59) = 0.457$ ,  $p = 0.001$ . Blood transfusion was performed for 18 (29.5%) patients. Average blood loss of patients who received blood transfusion was  $605,56 \pm 451,43$  ml. Average blood loss of patients who had not received blood transfusion was  $393,02 \pm 160,20$  ml. There was no statistically significant difference in blood loss between these groups: patients who had received blood transfusion and patients who had not. Average hemoglobin decrease of patients who had received blood transfusion was  $30.71 \pm 15,72$ g/l. Average hemoglobin decrease of patients who had not received blood transfusion was  $26.98 \pm 12,44$ g/l. There was no statistically significant difference in decrease of hemoglobin between these groups: patients who had received blood transfusion and patients who had not.

## Conclusions

1. The most common indication for THA was coxarthrosis.
2. The most common type of prosthesis fixation was cement.
3. The decrease of hemoglobin level was statistically significant after the operation.
4. The link between blood loss and decrease of hemoglobin was significantly positive.
5. The link between blood loss and duration of the operation was significantly positive.
6. The link between blood loss and duration of hospitalization was significantly positive.

7. There is no statistical significance in blood loss between groups that had received blood transfusion and those, which had not.
8. There is no statistical significance in decrease of hemoglobin between groups that had received blood transfusion and those, which had not.

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## SENTINEL LYMPH NODE BIOPSY IN FACIAL CUTANEOUS SQUAMOUS CELL CARCINOMA

*Simonas Jonas Norvydas, Rokas Liubauskas*

*Supervisor of the abstract: Donatas Samsanavičius*

*Department of Plastic and Reconstructive Surgery, LSMU, Lithuania*

### Introduction

The incidence of cutaneous squamous cell carcinoma (CSCC) has been steadily rising over the last decade. Although, metastases are relatively rare, it is still not uncommon and the standard management of CSCC is disputable. Sentinel lymph node biopsy (SLB) is emerging as a probable addition to the treatment, but its benefit has been failed to be recognised. Therefore, we decided to evaluate the role of SLB in facial CSCC, as this area is considered to be high-risk.

### Aim

To evaluate the relation between characteristics of cutaneous squamous cell carcinoma of the face area and findings of sentinel lymph node biopsy.

### Objectives

- 1) To evaluate the characteristics of tumour, region, patient.
- 2) To evaluate the risk factors (size, margin, ulceration, Breslow, pT) of the facial CSCC.
- 3) To assess SLB outcome.
- 4) To define the role of SLB in facial CSCC.

### Methods

We conducted a study in which we enrolled patients who were treated in HLSMU Department of Plastic and Reconstructive surgery between Dec. 2012 and Dec. 2014. Patient consent was obtained beforehand. All patients were evaluated via physical exam, tumour biopsy and underwent a surgery - tumour excision with SLB. <sup>99m</sup>Tc-albumin nanocolloid was used as a radiopharmacological agent. Statistical analysis was performed using SPSS 21.0 software package. Mann-Whitney U test was used with significance level of 0.05.

### Results

Total of 25 patients were included in the study (15 female, 10 male). The mean age of female patients was 74.64±11.28 years (range: 43.61 - 85.15), and 76.94±8.54 years (range: 66.00 - 85.89) of males accordingly. Most of the cases were localised on the cheek. Female patients are more frequently diagnosed with CSCC of the cheek than

male ( $p < 0.05$ ). Despite the high incidence, most of the lesions were pT1 stage. The diameter of the lesion was from 0.1 to 7 cm. The average diameter variation depending on the region:  $1.4 \pm 0.75$  cm on cheek,  $1.18 \pm 0.59$  cm on ear,  $0.5 \pm 0.33$  cm on nose,  $0.93 \pm 0.3$  cm on forehead,  $2.56 \pm 2.51$  cm on temporal area. According to histological examination, Breslow depth of invasion ranged from 0.3 to 10.1 mm. The average tumour thickness was  $2.75 \pm 2.42$  mm. Assessing CSSC according to TNM classification revealed most of the cases were pT1 and pT2 category. All of the lesions located on the ear were categorized as pT2 and occurred only in males. More than half observed tumours were ulcerated (56%). Total of 33 lymph nodes were removed during sentinel lymph node biopsy. Micrometastases were not detected. Until the date of March 1st 2015 not a single relapse event was observed. During follow-up period local or distant metastases were not identified.

### Conclusions

1) Majority of facial squamous cell carcinomas were localized in cheek region. Most of these cancer cases can be considered as low-risk lesions. 2) All ear cases were pT2 stage ulcerating tumours. Despite increased risk of micrometastasis of these cases, SLB failed to identify such findings. 3) The need of SLB in facial CSCC cannot be established. SLB did not influence the treatment strategy whatsoever.

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## WOUND AREA MEASUREMENT USING PLANIMETRIC AND ELECTRONIC TECHNIQUES

*Romualdas Dasevičius, Tomas Ptašinskas*

*Supervisor of the abstract: Domantas Rainys*

*Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Plastic and reconstructive surgery department, Lithuania*

### Introduction

Wound area measurement is an important part of clinical wound evaluation, which describes wound's healing process, efficiency of care and treatment strategy. Different techniques of measurement have their own advantages and disadvantages. Planimetric methods require less skills, time and equipment, while electronic measurement techniques are more accurate, do not require direct contact with wound, but more equipment and more skills are needed [2]. We compared different techniques of wound measurement in order to find the easiest, the most accurate and suitable for wide use. Universal measurement technique would allow to simplify wound evaluation and decide efficiency of treatment strategy as well as facilitate interstudy comparisons.

### Aim

To compare planimetric and electronic techniques of wound area measurement.

### Objectives

- 1) To compare accuracy of wound area measurement while using different techniques.
- 2) To research which technique of wound area measurement is the least and the most time consuming.

## Methods

Experimental investigatory study has been done. In order to do this study the permission No. BEC-MF-436 was given by LSMU Kaunas Region Biomedical Research Ethics Committee. For this study we imitated real wounds by using 32 2-dimensional paper templates with known surface area and irregular form and borders (surface area 9 cm<sup>2</sup>). These templates were glued on convex surface in order to achieve 3-dimensional wound model. All experimental wound models were measured by two independent researchers while using planimetric measurement techniques (by multiplying measured maximum vertical and horizontal length; measuring horizontal and vertical length at 12-6 and 3-9 hours; measuring diagonal lengths; measurement while using 2x2 mm checkered transparent film) and electronic measurement techniques (while using Adobe Photoshop CS4, Wound Areas Professional 4.3.1 programs). Time of measurement (sec.) was obtained by chronometer. The data was processed using SPSS v\_22.0 program while applying Shapiro-Wilk, independent sample T, one sample T tests and statistical criteria ( $p < 0.05$ ).

## Results

Two independent researchers measured 32 experimental wound models and the results for the interobserver variability were insignificant ( $p > 0.05$ ).

The results of planimetric measurement techniques:

1. According to the maximum vertical and horizontal lengths the average size was  $13.196 \pm 1.960\text{cm}^2$ . Surface area varies significantly from  $9\text{cm}^2$  ( $p = 0.001$ ). The average time of measurement was  $30.031 \pm 3,206\text{sec}$ .
2. According to the horizontal and vertical wound lengths at 12-6 and 3-9 hours the average surface area was  $9.405 \pm 0.604 \text{ cm}^2$ . Surface area varies significantly from  $9\text{cm}^2$  ( $p = 0.001$ ). The average time of measurement was  $22.156 \pm 2.705\text{sec}$ .
3. According to the diagonal wound lengths the average surface area was  $9.767 \pm 2.085\text{cm}^2$ . Surface area varies significantly from  $9\text{cm}^2$  ( $p = 0.046$ ). The average time of measurement was  $24.219 \pm 2.274\text{sec}$ .
4. According to 2x2mm checkered transparent film the average surface area was  $8.765 \pm 0.197\text{cm}^2$ . Surface area varies significantly from  $9\text{cm}^2$  ( $p = 0.001$ ). The average time of measurement was  $122.844 \pm 7.843\text{sec}$ .

The results of electronic measurement techniques:

1. According to the results got by Adobe Photoshop CS4 the average surface area -  $8.938 \pm 0.432\text{cm}^2$ . Surface area varies insignificantly from  $9\text{cm}^2$  ( $p = 0.420$ ). The average time of measurement -  $107.094 \pm 4.411\text{sec}$ .
2. According to the results got by Wound Areas Professional 4.3.1 the average surface area -  $8.047 \pm 1.054\text{cm}^2$ . Surface area varies significantly from  $9\text{cm}^2$  ( $p = 0.001$ ). The average time of measurement -  $84.313 \pm 3.618\text{sec}$ .

## Conclusions

1. After comparing six different techniques of wound area measurement, the most accurate measurements were achieved by using Adobe Photoshop CS4, the least accurate measurement was achieved by measuring the maximum vertical and horizontal wound length.
2. The least time consuming technique of wound area measurement was measuring the horizontal and vertical lengths at 3-9 and 12-6 hours. The most time consuming technique of wound area measurement was measuring surface area while using 2x2mm checkered transparent film.

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