XIII Baltic Nephrology Conference

Final programme

October 13 - 15, 2016, Jurmala, Latvia

Organized by:
Latvian Association of Nephrology

In cooperation with:
Estonian and Lithuanian associations of Nephrology,
ERA-EDTA,
ISN

Welcome to XIII Baltic Nephrology Conference

Dear colleagues and friends! It is an honour for our nephrology association to welcome you in Latvia to XIII Baltic Nephrology conference! With your participation we are sure it will turn out as great a scientific and nephrological success as were all 12 previous biannual meetings.

This is the same conference hotel where in 1992 our first seminar was held, which started tight friendship of nephrological community of Baltic states. First meeting also heralded rapid development of modern nephrology in our countries. Seminal initiative came from our teachers – professor Eberhard Ritz and professor Ilmārs Lazovskis. During these fast flying 24 years many well known nephrologists have committed to our education — Stewart Cameron, Barry Brenner, Francesco Locatelli, Norbert Lameire, Claudio Ponticelli to mention just a few. Professor Eberhard Ritz was in centre of organisation of almost all meetings and we warmly wish to our great friend a strong health further.

During these years nephrology in our countries have stepped to the new, more advanced level. Some of these advances are expressed in good RRT incidence, in more that 50% of transplanted patients, in high percentage of PD patients in dialysis, top quality HD techniques, extensive usage of renal biopsies and good morphological expertise in all 3 countries and also due to friendly cooperation.

We hope this meeting will give new ideas of further development to everyone and also will give enjoyment to meet old friends.

Aivars Pētersons
President, XIII Baltic Nephrology conference
President, Latvian Association of Nephrology

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Aivars Pētersons

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Programme

Thursday, October 13

15.00 – 21.00	Registration	
17.00 – 20.00	Welcome reception	

Friday, October 14

9.00 – 9.20	Opening	**Aivars Petersons, Andrzej Wiecek**
	Chairmen – Andrzej Wiecek (Poland), Aivars Petersons (Latvia)	
9.20 – 10.00	Resistent hypertension: state of the art	**Andrzej Wiecek**
10.00 – 10.40	Membranous nephropathy – progress towards rational therapy	**Andrew Rees**
10.40 – 11.00	*Coffee break*	
	Chairmen – James Heaf (Denmark), Vytautas Kuzminskis (Lithuania)	
11.00 – 11.40	Role of magnesium in nephrology	**Steven Van Laecke**
11.40 – 12.20	Complement role in renal diseases	**Sakari Jokiranta**
	Short oral presentations	
12.20 – 12.30	**Vaida Petrauskiene**, et al. Vascular calcification and biomarkers in hemodialysis patients with novel cardiovascular events.	
12.30 – 12.40	**Jana Holmar**, et al. Total removed Beta-2 microglobulin and urea during different dialysis treatment modalities.	
12.40 – 12.50	**Maija Motivāne**, et al. Predictors of treatment success in antibody - mediated rejection after kidney transplantation.	

13.00 – 14.00	*Lunch*	
14.00 – 14.25	ISN Pioneer Award ceremony – **Prof. Vytautas Kuzminskis** Presented by **John Feehally, Inga Bumblyte**	
	Chairmen – John Feehally (UK), Inga Bumblyte (Lithuania)	
14.25 – 15.10	Classification and management of IgA nephropathy	**John Feehally**
15.10 – 15.50	The future of peritoneal dialysis	**James Heaf**
	Short oral presentations	
15.50 – 16.00	**Ülle Pechter**, et al. Physical activity and quality of life in patients with chronic kidney disease. A cross-sectional study in Estonia.	
16.00 – 16.20	*Coffee break*	
	Chairmen – Andrew Rees (Austria, UK), Merike Luman (Estonia)	
16.20 – 17.00	ANCA-associated vasculitis – new developments and current uncertainties	**Andrew Rees**
17.00 – 17.40	Renal research: past, present and future	**John Feehally**
	Short oral presentations	
17.40 – 17.50	**Anna Silda**, et al. Hydration status assessment in peritoneal dialysis patients using bioimpedance analysis.	
17.50 – 18.00	**Kārlis Rācenis**, et al. Bacteriophages as potential treatment for infections in *S.aureus* colonised nephrological patients: an in vitro study.	
19.00	*Nephrological dinner*	

Saturday, October 15

Chairmen – Steven Van Laecke (Belgium), Ieva Ziediņa (Latvia)

9.00 – 9.40	Fabry nephropathy: challenges in diagnosis and treatment	**Marius Miglinas**
9.40 – 10.20	Diabetes mellitus in transplanted patient	**Steven Van Laecke**
10.20 – 11.00	Diagnosis and treatment of atypical HUS	**Kati Kaartinen**

Short oral presentations

11.00 – 11.10	**Marta Kantauskaite**, et al. Mineral bone disease among patients with new onset diabetes after renal transplantation.
11.10 – 11.20	**Egle Dalinkeviciene**, et al. First-year renal graft survival: which factors play the main role?
11.20 – 11.50	*Coffee break*

Chairmen – Marius Miglinas (Lithuania), Mai Rosenberg (Estonia)

11.50 – 12.20	Early vascular access dysfunction – problems and solutions	**Sondra Kybartiene-Maciulaite**

Short oral presentation

12.20 – 12.30	**Mai Rosenberg**, et al. Estonian Health Insurance Fund expenditures for persons with End-Stage Kidney Disease
12.30 – 13.10	Continuation of discussion of Baltic RRT statistics and problems: Estonia – **Mai Rosenberg**; Lithuania – **Edita Ziginskiene**; Latvia – **Harijs Čerņevskis**

13.10	Best abstract rewards	**Ināra Ādamsone**
13.20	Closing remarks	**Aivars Pētersons**
13.30 – 15.00	*A farewell lunch*	

Conference venue

Conference will take place at the Baltic Beach hotel, Jūras iela 23/25, Jūrmala, Latvia.
www.balticbeach.lv.
Location is very convenient and accessible in 10 minutes from airport and in 30 min from Riga city center. This conference hotel is also historical for all Baltic nephrology due to the fact, that there the first ever Baltic Nephrology conference in 1992 took place.

Posters

Posters should be placed on the stand Friday 7.00 – 8.30 according to their number. Please remove your poster before Saturday 12.00.

How to register and book room in conference hotel

On-site registration is available. Participation fee 200 EUR. Room in conference hotel is not guaranteed, but there are other hotels in vicinity, like Jurmala SPA.

Lecturers

John Feehally
Professor, Emeritus Consultant Nephrologist,
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Honorary Professor of Renal Medicine,
University of Leicester
Programs Chair, International Society
of Nephrology
Chair, Kidney Research UK

James Heaf
Chief Physician, Herlev Hospital, University
of Copenhagen
Director, Danish Nephrology Registry

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Department of Internal Medicine
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Marius Miglinas
Professor, Head of Nephrology centre,
Santariskiu clinic,
Vilnius University, Lithuania

Andrew Rees
Professor, Clinical Institute of Pathology
Medical University of Vienna, Austria

Andrzej Wiecek
Professor, President, European Renal Association-
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Head, Department of Nephrology,
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Harijs Čerņevskis
Natālija Čirkova
Sandra Derkevica
Inese Folkmane
Elizabete Folkmane
Arta Gertnere
Anda Grigāne
Liene Jaceviča
Edīte Jeruma
Ina Kārkliņa
Dzintra Krastiņa
Dzintra Krugale
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Maija Mukāne
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Aivars Pētersons
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Ilze Puide
Kārlis Rācenis
Gunta Reitere
Georgs Ritovs
Krišjānis Ritovs
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Ligita Zepa
Ieva Ziediņa
Uģis Zviedrītis
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Jurgen Arund
Asta Auerbach
Olga Didenko
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Inga Arune Bumblyte
Egle Dalinkeviciene
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Inese Zuļģe
and more.

Abstracts

ASSOCIATION BETWEEN DONOR SPECIFIC ANTIBODIES AND CLINICAL AS WELL AS HISTOLOGY FINDINGS OF KIDNEY TRANSPLANT RECIPIENTS IN VILNIUS UNIVERSITY HOSPITAL SANTARISKIU KLINIKOS

Kristina Steponaviciute, **Ernesta Macioniene**, Marius Miglinas
Vilnius University, Vilnius, Lithuania

Introduction: Acute kidney transplant rejection is diagnosed according to Banff criteria which include both donor specific antibodies and histology findings. Donor specific antibodies are detected by Luminex technology which was started in Vilnius University hospital Santariskiu klinikos (VUHSK) several years ago. The aim of our study was to evaluate the association between donor specific antibodies and antibody mediated histology changes and to analyze treatment strategy according to immunology and histology test results.
Methods: a retrospective study was performed in VUHSK including 65 patients who underwent kidney transplant biopsy in 2014 – 2015 and had at least one immunology test (Luminex, flow cytometry or lymphocytotoxic cross match) performed by the time of kidney biopsy. According to these criteria 89 transplant biopsies were included into further analysis.
Results: From 89 kidney transplant biopsies 1 (1.1%) had normal histology, 39 (43.8%) were diagnosed as transplant rejection, 20 (22.5%) chronic nephropathy/glomerulopathy, 29 (32.6%) - other. From immunology tests 46 were primary solid phase Luminex test (32 (69.6%) of which were positive) and 24 were specificity Luminex test (21(87.5%) of which were DSA positive). In a Luminex positive group of cases, histological changes distributed as follows: ptc0 – 65.0%, ptc1 – 29.3%, ptc2 – 4.9% (comparing to Luminex negative group – ptc0 – 76.9%, ptc1 – 23.1%, ptc2 - 0%, but p>0.05); g0 – 61.0%, g1 – 29.3%, g2 – 7.3%, g3 – 2.4% (comparing to Luminex negative group – g0 – 84.6%, g1 – 15.4%, g2 and g3 - 0%, but p>0.05). All cases with C4d3 positivity were Luminex positive. Comparing GFR change form baseline at the time of transplant biopsy in Luminex positive group GFR change was -2.8± 10.3 ml/min./1.73m2, while in Luminex negative group +2.0 ± 12.2 ml/min./ 1.73m2. 3 moths after kidney biopsy GFR change in Luminex positive group was +10.6± 24,3 ml/min./1.73m2 while in Luminex negative group +6.8± 24,3 ml/min./1.73m2 (however p>0.05). Additional immunosuppressive treatment was prescribed for 53.7% of patients in Luminex positive and for 38.5% in Luminex negative group (p=0.263), while in patients with histological diagnosis of rejection it was prescribed in 92.1% of patients comparing to 28.0% in a group of no rejection in histology (p=0.000).
Conclusion: Although not statistically significant, there was a tendency for glomerulitis, ptc1-2 and C4d3 to be found more often in Luminex positive group. Additional immunosuppressive treatment was prescribed according to histology changes but not immunology test results.
Keywords: donor specific antibodies, kidney transplant rejection, Luminex technology.

ESTIMATION OF THE INFLUENCE OF K/V ON POST DIALYSIS UREA REBOUND IN HD AND HDF WITH TRADITIONAL AND OPTICAL METHODS

2

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Introduction and aim: Due to the reequilibration of urea concentrations between body compartments a rapid increase in urea plasma concentration – the post dialysis urea rebound (PDUR) – occurs immediately after the completion of HD. Previous studies have shown that the magnitude of PDUR is related to dialysis efficiency [1, 2]. The aim of the study was to investigate the effect of hourly removal of urea, estimated as K/V, on post dialysis urea rebound in two treatment modalities (HD, HDF). Also, the possibility of applying the optical method for the monitoring of dialysis adequacy [3] for the assessment of this effect was examined.
Subjects and methods: 20 uremic patients (9 female, 11 male, mean age 58.8±11.9 years) were included in the study. 37 HD and 30 HDF sessions were followed. K/V was estimated from eKt/V calculated based on blood urea concentration (K/Vb) and UV-absorbance in spent dialysate samples (K/Va). PDUR was calculated based on blood urea concentration. Linear regression was used to analyze the relationship between K/V and PDUR. Blood flow rate (Qb), dialysate flow rate (Qd), body weight after dialysis (BWpost) and total ultrafiltration (UFtot) were also included in the analysis. Student's t-test for dependent samples was used to compare means for different methods, $p<0.05$ was considered significant.
Results: In case of HD average K/Vb (mean±SD) was 0.35±0.07 (N=37) and it was positively correlated with PDUR (R2=0.28). K/Va, average 0.32±0.06 (N=37), was significantly lower compared to K/Vb ($p<0.05$). However, when also UFtot was included in the regression analysis there was a similar correlation with PDUR (R2=0.32) as in case of K/Vb. In case of HDF average K/Vb was 0.34±0.09 (N=30) and it was strongly correlated to PDUR (R2=0.53). K/Va, average 0.32±0.09 (N=30), was not statistically different from K/Vb ($p=0.25$). Similarly to HD, when Qb was included in the regression analysis the correlation with PDUR (R2=0.43) was similar to K/Vb.
Conclusion: The results suggest that post dialysis urea rebound is influenced by K/Vb, and the treatment modality (HD, HDF). This is also in compliance with previous results [1, 2]. The results further indicate that the same relationship can be seen in case of K/Va, provided UFtot and Qb are taken into account as well. The merits of the method utilising UV-absorbance are that it does not need blood samples and trends can be easily monitored.
Keywords: hemodialysis, hemodiafiltration, rebound.

RESULTS OF KIDNEY TRANSPLANTATION IN PATIENTS WITH HYPERURICEMIA

3

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Introduction: In kidney transplant recipients (KTR), hyperuricemia (HU) is a commonly observed phenomenon, due to both calcineurin inhibitors (particularly cyclosporine A) and reduced kidney allograft function. The association of elevated uric acid (UA) level and kidney transplant graft function/failure still remains controversial.
Objective: We conducted a retrospective study to determine the prevalence of HU, its risk factors and graft function/survival according UA level among KTR.
Material and methods: A total of 138 patients were included in the study. We used univariate analyses to compare clinical and demographic data between the hyper- and normouricemic groups. We used multivariate adjusted logistic regression to detect independent predictors of HU. Hyperuricemia was defined as serum uric acid level of > 416 µmol/L (7 mg/dL) in men and of > 357 µmol/L (6 mg/dL) in women or xanthine-oxidase inhibitors use.
Results: The patients had a mean age of 46.6±13.9 years and a median posttransplantation time of 3.4 years. The prevalence of HU was 42.4% (n=61). There was a significant relationship between HU and graft loss ($p = 0.031$). Multivariable analysis using a logistic regression model showed the following to be independent predictors of HU: increased body mass index (OR 1.90; $p = 0.042$), reduced eGFR in 24 month after kidney transplantation (OR 1.32; $p = 0.041$), cystic kidney diseases (OR 4.95; $p = 0.001$), diuretics and RAS inhibitors use (OR 2.68; $p = 0.025$ and OR 2.22; $p = 0.018$, accordingly) and graft loss as well (OR 5.25; $p = 0.031$). Kaplan-Meier graft survival curve was significantly ($p = 0.027$) lower in HU group than that of normouricemic group.
Conclusion: Hyperuricemia is a common complication after kidney transplantation. Risk factors associated with post-transplant HU include increased body mass index, reduced eGFR in 24 month after kidney transplantation, cystic kidney diseases, diuretics and RAS inhibitors use and graft loss as well. Hyperuricemia is a significant predictor of long term graft loss.
Keywords: hyperuricemia, kidney transplantation, allograft function.

THE PROGNOSTIC VALUE OF THE BIOELECTRICAL IMPEDANCE ANALYSIS PARAMETERS IN PREDICTING MORTALITY OF HEMODIALYSIS PATIENTS

4

Diana Sukackiene[1], Alvita Gincaite[2], Vaidas Vicka[2], Laurynas Rimsevicius[1,2], Marius Miglinas[1,2]
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Background: The bioelectrical impedance analysis (BIA) is a commonly used method in hemodialysis (HD) patients' care for the assessment of the hydration status. Increasing pool of evidence shows that various BIA parameters are related to the poor prognosis of the patient. Therefore our aim was to establish which BIA parameter best predicts the mortality and to combine it with the conventionally used risk factors.
Methods: We conducted a prospective observational study in a tertiary reference hospital. BIA was measured post HD procedure providing measurements of extracellular water / total body water ratio, phase angle (PA) and fat free mass index. Also routine laboratory findings, subjective global assessment scale and various comorbidities were gathered. Factors were split into 2 groups: BIA parameters group and conventional group. The patients then were observed for 12 months and the mortality rate was evaluated. Factors in each group were entered into separate multivariate logistic regression models. Independent predictors of mortality in each group were combined to form a more accurate predictor. The accuracy was determined using ROC AUC curve.
Results: We observed 37 patients. Mean age of the patients was 62,49 ±14,3 years, more than a half of them were men 21 (56,8%) with median time on HD for 4,0 [1,5-7,5] years and mean Charlson comorbidity index of 5,65 ± 2,46. The mortality rate was 21,6 % (n = 8). In the conventional factors' group albumin was found as the most potent predictor of mortality with OR of 4,587 (95 % CI =0,057-0,839, p= 0,027) and ROC AUC of 0,976 (95% CI = 0,93 – 1,0, p < 0,001). In the BIA parameters group PA was revealed as the most accurate predictor of mortality with OR = 6,849 (95 % CI =0,038- 0,555, p=0,005) and ROC AUC of 0,932 (95% CI = 0,84 – 1,0, p = 0,001). The combined albumin-PA factor was more accurate than these factors alone with ROC AUC of 0,988 (95 % CI =0,96- 1,0, p < 0,001).
Conclusion: The most accurate predictors of 12 months mortality were albumin and phase angle. The combination of these factors amounted to higher accuracy, therefore we recommend using the PA for the risk stratification in HD patients. Further research with a larger sample is needed to verify the results.
Keywords: Hemodialysis, Mortality, Phase angle, Albumin.

SEVERE ACUTE KIDNEY INJURY IN ELDERLY PATIENTS

5

Vilma Balciuviene, Inga Skarupskiene, Edita Ziginskiene, Inga Arune Bumblyte
Lithuanian University of Health Sciences, Medical Academy, Nephrology department

Background: In older adults acute kidney injury (AKI) rates have been steadily increasing over the past few decades due to multiple contributing factors. Older persons who develop AKI also have higher rates of short- and long-term mortality, prolonged hospital stays, AKI-related morbidity, functional decline and related health care costs. The aim of our study was to analyze the differences in etiology and outcomes of severe AKI in elderly patients and compare to non- elderly.
Methods: We performed retrospective analysis of all patients with severe AKI requiring renal replacement therapy (RRT) and treated in the Hospital of Lithuanian University of Health Sciences Kauno Klinikos (HLUHS KK) from January 1 to December 31 in 2012. The patients with severe AKI were divided into two groups: < 65 years old - non-elderly patients and ≥65 years old - elderly patients.
Results: Data of 313 patients was analysed. The mean age of patients was 67.64±15.3 years. The number of elderly patients (n=201; 64.2%) was significantly higher than non-elderly (n =112; 35.8%, $p<0.05$). The causes of AKI were renal, prerenal, obstructive, polietiological and in some cases unknown. There were no significant differences found between causes of AKI in the elderly and the non-elderly patients group. Overall the main cause of AKI was acute tubular necrosis and it's number was significantly higher in elderly patients than in non-elderly (54.5% vs 41.5%, $p<0.05$). The elderly patients more often developed septic AKI than non-elderly (27.64% vs 19.6%), but the number of hepatorenal syndrome was higher in non-elderly group (7% vs 0.1%). The outcomes in elderly patients group were worse than in non-elderly: only 24.95 of patients the renal function improved and RRT was stopped, even 57.2% of elderly patients died, 17.9% - remained chronic kidney failure. In the multivariate logistic regression analysis, creatinine ($p = 0.014$, odds ratio 2.853, 95% CI 1.232, 6.603), systolic blood pressure ($p = 0.000$, odds ratio 5.504, 95% CI 2.390, 12.676), SOFA score ($p = 0.000$, odds ratio 5.183, 95% CI 2.099, 12.796) and sepsis ($p = 0.013$, odds ratio 0.354, 95% CI 0.157, 0.800) were found to be independent risk factors for death of the elderly patients with AKI.
Conclusion: The elderly patients consist two third of hole patients with severe AKI. Acute tubular necrosis remained the dominant cause of AKI. To compare to non-elderly, the outcomes in elderly patients group were worse, more than half had died, kidney recovery in survivors was lower. High death rate was associated to systolic blood pressure, serum creatinine, SOFA score and sepsis.
Keywords: Acute kidney injury, outcomes, acute tubular necrosis, hemodialysis.

COULD UREA IN SPENT DIALYSATE BE A MARKER FOR MONITORING REMOVAL OF 4-PYRIDOXIC ACID?

6

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[2] Centre of Nephrology, North Estonian Medical Centre, Tallinn, Estonia

Introduction and Aim: Urea is one of the most known uremic toxin that is cheap and very easy to measure. Additionally to urea toxicity, vitamin deficiency is common in chronic kidney disease (CKD) patients. One vitamin that CKD patients are lacking is vitamin B-6 (B6). The deficiency of B6 has been linked to many pathologies including impaired gluconeogenesis and glucose tolerance, regulation of the level of circulating insulin, metabolism of amino acids, diabetes type 1 and 2. The deficit of B6 in dialysis patients is treated by regular B6 administration. For estimating B6 status it has been proposed to measure urinary 4-pyridoxic acid (4-PA) [1], the major urinary catabolite of B6.
The aim of this work was to determine if the removal of 4-PA and urea are similar and whether urea in spent dialysate could be used as a marker for 4-PA elimination in uremic patients.
Patients and Methods: Ten patients (age 59 ± 15 years) were followed during a single hemodialysis session. 100 mg B6 was routinely injected to patients after each dialysis session. The dialysis machine used was Fresenius 5008H (Fresenius Medical Care, Germany), dialyzer was FX1000, the dialysate and blood flows were 500 mL/min and 350 mL/min, respectively. Spent dialysate samples were taken 10, 60, 120, 180 and 240 minutes after the start of hemodialysis. Concentrations of 4-PA were determined with high pressure liquid chromatograph (Dionex UltiMate 3000 RS, Sunnyvale, CA, USA) with fluorescence detection. Urea concentrations were determined in Synlab Eesti OÜ (Estonia) laboratory using standardized methods.
Results: The interpatient variation of the initial 10 min dialysate concentration for urea (7.11 ±2.5 mmol/L) and 4-PA (0,006 ±0.004 mmol/L) was distinctive.
The removal ratios (RR) of 4-PA and urea were statistically different (p=0.009) with 61.9 ±8.6% and 70.3 ±9.4%, respectively.
Discussion and Conclusion: The elimination of urea during hemodialysis is statistically different from elimination of 4-PA and cannot be used as marker for elimination of 4-PA. Our data confirms the perception that urea could not be used as a marker for the removal of other uremic solutes [2]. The large variation in 4-PA concentration after injection of equal overdoses of B6 raises the question of reasons of diversity of B6 metabolism in uremic patients.
Keywords: 4-pyridoxic acid; urea; monitoring; spent dialysate.

MANAGEMENT OF URINARY TRACT INFECTION IN KIDNEY TRASPLANT RECIPIENTS WITH POLYCYSTIC KIDNEY DISEASE

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Background: Autosomal dominant polycystic kidney disease (ADPKD) is the most frequent inherited kidney disease. Infection of one or more cysts in patients with polycystic disease usually occurs as a complication of ascending urinary tract infection (UTI). It most often manifests as relapsing infection. Immunosuppressive status after kidney transplantation makes these infections even more severe and frequent.
Aim: We investigated whether bilateral nephrectomy can cure recurrent UTI in kidney transplant recipients with polycystic kidney disease.
Materials and methods: In a retrospective study we analysed medical records of hospitalized patients with diagnosis ADPKD at Pauls Stradins Clinical University Hospital on the period from 1 January 2013 until 1 November 2015. Diagnosis of renal cyst infection was made by CT scanning.
Results: In this period 289 patients with ADPKD were hospitalized. 74 (26%) of them had recurrent urinary tract infection. Majority of them, 50 of 74 patients (67%), had a functioning kidney transplant. Renal cyst infections had 20 (27%) patients (5 transplant recipients) and urinary tract infection – 54 (73%) patients (45 transplant recipients). Simultaneous transplant pyelonephritis was diagnosed in 4 (8%) recipients. Patients with renal cyst infection had higher body temperature (average for 2.5 oC) during admission and more severe leukocytosis 9,36 x103/L *vs* 7,55 x103/L ($p = 0,05$), and higher CRP 126,33 mg/L *vs* 39,55 mg/L ($p < 0,001$) than patients with UTI. Renal cyst/cysts infectious agent was specified by fluid aspiration only in 7/20 (35%) cases. Cyst infections agents were enteric flora - *Escherichia coli*, three of seven cases (42.9%) and *Enterococcus spp*. two of seven cases (28.6%). All patients receive antibiotic therapy, but 24 patients (32%) in addition had nephrectomy. In 17 cases of 24 (71%) patients had kidney transplant. 12 patients (50%) had bilateral nephrectomy, seven patients (29%) had unilateral nephrectomy and later infection didn't occur. The infection reoccurred only in one patient who had bilateral nephrectomy and four patients (17%) who had unilateral nephrectomy. Antibacterial therapy for the cyst infection was ciprofloxacin 12 of 20 times (60%) and ceftriaxone 10 of 20 times (50%). Antibacterial

therapy for other UTI than cyst infection included ciprofloxacin in 26 (48.1%), amoxicillin/clavulanate in 21 (38.9%) and nitrofurantoin in 16 (29.6%) cases. Duration of hospitalization in patients with cyst infection was greater than UTI respectively 14.4 ± 6.2 days and 10.9 ± 6.6 days (p = 0.04). No any patient died due to recurrent UTI/renal cyst infection/urosepsis.
Conclusion: UTI and native kidney cyst/cysts infection is more common in transplant patients than non-transplant patients with polycystic kidney disease. Due to ineffective antibacterial therapy and/or due to infection's deteriorating effect of transplant function in one third of admitted patients additional nephrectomy was performed. Nephrectomy eliminated recurrent UTI in majority of cases. All urinary tract and native kidney cyst infections were cured with antibiotic or combined therapy that included antibiotic therapy plus cyst drainage or nephrectomy.
Key words: Autosomal dominant polycystic kidney disease, urinary tract infection, nephrectomy.

ATYPICAL HEMOLYTIC URAEMIC SYNDROME: 10 YEARS SINGLE CENTRE EXPERIENCE

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Background: Hemolytic uremic syndrome (HUS) is defined by the triad: microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury. Atypical HUS (aHUS) is an extremely rare disease, described as hemolytic-uremic syndrome which is not mediated by *Shiga* toxin. This disease is usually caused by disorders in complement alternative pathway regulation or may be secondary due to *Streptococcus pneumoniae* or other causes. aHUS represents 5-10% of HUS in children. The disease has a poor prognosis - 50-60% progress to ESRD. We present a single centre experience of aHUS.

Methods: 7 patients (2 girls, 5 boys) were treated in The Hospital of Lithuanian University of Health Sciences (LSMU) **Kauno klinikos during the period of 2007-2016**. The mean age at the onset of the disease – 6,0 (2,5-13) years. Age at the onset of the disease, results of genetic tests, number of recurrences, initial and supportive treatment and renal function are listed in the 1 table. Table 1. Age at the onset of the disease, results of genetic tests, number of recurrences, initial and supportive treatment and renal function in 2016.

Number of the patient	Age at the onset of the disease (years)	Genetic tests	Anti-CFH	Number or recurrences	Initial treatment	Supportive treatment	Renal function
1	12	Negative (CFH, CFI, C3, MCP)	Positive	1	PT	-	Transplantation at the age of 14
2	13	-	Positive	1	PF	MMF+IgG	Normal
3	5	Negative (C3, MCP, CFI, CFH)	Negative	-	PF	-	Normal
4	3,5	Negative (CFI, CFB, C1q AG)	Negative neuramidase positive	-	Sepsis treatment	-	CKD 3 st.
5	3,5	Negative (C3, CFH, CFI, MCP)	Negative	1	PF	PI→ Eculizumab	CKD 3 st.
6	2,5	Negative (CFI, CFB, C1q AG)	Negative	-	Eculizumab	Eculizumab	Normal
7	2,5	Not performed	Not performed	-	PF	-	CKD 2 st.

CFH-complement factor H; CFI-complement factor I; MCP-membrane cofactor protein (CD46); PT-plasma transfusion, PF- plasmapheresis, PI: plasma infusion, MMA-mycophenolate mofetil, Ig-Immunoglobulin G, CKD- Chronic Kidney Disease

Conclusions: 1) 7 children diagnosed aHUS during the period of 10 years. 2) Four (57%) children developed CKD. One of them was transplanted. 3) Causes of aHUS are different thats why clinical features and outcomes are different. 4) Treatment with *Eculizumab* significantly improved outcome of the disease.
Keywords: complement system, atypical hemolytic uremic syndrome, children.

RATIONALE OF A STUDY FOR PATIENT EMPOWERMENT AND SHARED DECISION SUPPORT FOR CARDIORENAL SYNDROME

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Background: Early detection and aggressive management of underlying causes and comorbidities are the most important aspects of cardiorenal syndrome. Preventing progression to end stage renal and/or cardiac deficiency may improve quality of life and help save health care costs. CARRE (Personalized patient empowerment and shared decision support for cardiorenal disease and comorbidities, EU-FP7 funded project, no.611140) employs internet aware sensors and sources of medical evidence to compile a variety of personalized alerting, planning and educational services. Within this project, patients are empowered and can make shared informed decisions.

Objectives: Primary objectives are: to increase health literacy; to increase level of patient empowerment; to improve patient quality of life; to reduce the personal risk of cardiorenal disease related morbidities (as these are described in the CARRE risk factor database). Secondary objectives are: to ameliorate or prevent the progression of clinical and laboratory parameters related to cardiorenal disease and comorbidities; improve lifestyle habits (smoking, physical activity, adherence to self-monitoring and therapy); limit the number or dose of essential drugs; test for intervention acceptability and/or user satisfaction.

Methods: Pilot study is ongoing at two sites, Vilnius University (Lithuania) and Democritus University of Thrace (Greece). Study population (total 160 patients) enrolls two groups of individuals: group 1 (40 patients) consists of patients with a diagnosis of metabolic syndrome according to criteria based on the Joint Interim Statement; group 2 (40 patients) consists of patients with either renal or heart disease, diagnosed as chronic kidney disease (CKD) stage 3a or CKD stage 2 with albuminuria or systolic heart failure, NYHA class II or III. Group 1 and group 2 are divided further into intervention and control groups (20 patients each). The patients in intervention group are trained to work with CARRE user interface, and scheduled to monitor their parameters with telemedicine devices at home: blood pressure monitor, scale, physical activity tracker, glucometers. The patients in control group have traditional medical care. The study started in July 2016.

Results: The study team in Nephrology center (Vilnius University Hopital Santariskiu Klinikos) enrolled 20 patients with CKD (median age 50.6), 10 patients in group 1 and 10 patients in group 2 (5 male and 5 female in each group). The intervention group (mean age 43.3) consists of 4 patients with CKD stage 2 with albuminuria, and 6 patients with CKD stage 3. Most patients (5) have a diagnosis of glomerulopathy. The control group (mean age 57.9) consists of 3 patients with CKD stage 2 with albuminuria, and 7 patients with CKD stage 3. Most patients (4) have a tandem diagnosis of diabetes and hypertension. All patients had screening and baseline visits, were register in CARRE platform, and underwent measurements and collection of required medical records.
Conclusion: The ultimate goal is to help patients with comorbidities take an active role in care processes, including self-care and shared decision making, and also to support medical professionals in understanding and treating comorbidities via an integrative approach. The first project results on the analysis of the cardiorenal disease and related sources of medical evidence are expected in the end of 2016.
Keywords: cardiorenal syndrome, patient empowerment, shared decision support.

PARTICULARITIES OF URINARY TRACT INFECTION IN TRANSPLANTED AND NON-TRANSPLANTED PATIENTS

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Background: The aim of the study was to identify the most common clinical, laboratory characteristics, agents, their resistance to antibiotics and treatment efficacy of acute and chronic exacerbated pyelonephritis (PN). The approach of the empiric antibiotic therapy is influenced by predominant agents in the population. Every country should have their own national empiric antibacterial treatment guidelines for this disease, which are based on research for the causative pyelonephritis agents and their sensitivity for antibacterial treatment. Unfortunately, there are no such guidelines in Lithuania at the moment. The tasks of the research: 1) to find the link between the incidence rate and the PN patients age, sex; 2) to determine the patients with the most common PN clinical symptoms, laboratory findings and compare their frequency between non-transplanted (non-Tx pts) and patients after kidney transplantation (Tx pts) groups; 3) to determine and compare the agents, causing PN in Tx and non-Tx pts, resistance to antibiotic treatment; 4) to determine average duration of antibiotic treatment and the most common empirical therapy, frequency of anti-recurrence urinary tract infections (UTI) therapy; 5) to evaluate the efficacy of the appointed antibiotic empirical therapy; 6) to evaluate the average length of hospitalisation (hospital days) for Tx and non-Tx pts.
Methods: We performed retrospective cohort study. The study involved 308 patients (37 (18,5%) Tx pts and 251 (81,5%) non-Tx pts) of Hospital of Lithuanian University of Health Sciences **Kauno klinikos (HLUHS KK)** Nephrology department, which were treated in 2013-2014 with acute, exacerbated chronic or transplanted kidney PN. There were 222 (72%) women and 86 (27,9%) men in your study. Patients average age was 55,0±20 years. The data were collected considering clinical symptoms, laboratory tests, empirical antibiotic treatment, the duration of treatment and the recommended anti-recurrence UTI therapy. The data were statistically significant at $p<0,05$.
Results and conclusions: 1. Women were diagnosed with PN more frequently than men. PN was more common in women up to 40 years. PN occurred more frequently in men after kidney transplantation. 2. More than 80% were diagnosed with fever. Non-Tx pts fever correlated with side pain and side pain with a positive Giordani's maneuver. Side pain and positive Giordani's maneuver had statistically significantly higher incidence of non-Tx than Tx pts. Hematuria, leucocytosis with neutrophilia were more frequently observed in non-Tx than Tx pts. 3. The most common PN agent was *E.coli* (65 % of all cases). *E.coli* was more common PN agent for non-Tx compared to Tx pts. *Klebiella pneumoniae* was more frequent PN agent for Tx than non-Tx pts. *E.coli* resistance to ampicillin

was 64,3 %. *Kl. pneumoniae* resistance to ampicilin and ampicillin/sulbactam was 100%, also we found high resistance to cefuroxime and ciprofloxacin. There was no microorganism resistant to all antimicrobial agents. 4. Average length of PN antibiotic intravenous treatment duration was 12 hospital days. Tx pts average treatment duration was statistically significantly longer. Tx pts treatment duration was >12 hospital days. The possibility that Tx pts will be treated with PN >12 days was 2.939 times higher than the non-Tx patients. Cefuroxime was used significantly more often for empirical PN treatment for the non-Tx pts. Empirical treatment for Tx pts often was imipenem. Anti-recurrence UTI therapy was recommended for 64% and more often for non-Tx patients. 5. PN clinical symptoms disappeared after an average of 6 days for both Tx and non-Tx pts. Non-Tx pts had fever significantly longer than Tx pts. 6. Hospital days' average was 12 days and significantly longer for Tx pts.
Key words: urinary tract infection, transplanted vs non-transplanted pts.

FACTORS RELATED TO SHORTER SURVIVAL OF PATIENTS WITH HEPATORENAL SYNDROME

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Aim and objectives: The aim of the study was to analyse aetiology, course of dialysis treatment, outcomes and prognostic factors of shorter survival in patients with hepatorenal syndrome (HRS) who received renal replacement therapy (RRT).
Methods: This was a retrospective cross-sectional study. Statistical analysis was performed using SPSS 22.0 and MedCalc 16.2.1 software. Variables obtained before the initiation of RRT were evaluated by univariate and multivariate analyses to identify prognostic factors of shorter survival. The study included patients with HRS who received RRT at the Hospital of Lithuanian University of Health Sciences Kaunas Clinics from 2010 to 2015 and met the International Ascites Club criteria for the diagnosis of HRS proposed in 2007.
Results: A total of 61 patients with type I HRS and liver cirrhosis (LC) were enrolled into a study. The main aetiology of LC was alcoholic liver disease (45.9%). Precipitating factors for HRS were found in 39 (63.9%) of cases. The most common precipitating factors were bacterial infection or spontaneous bacterial peritonitis (52.5%) and large volume paracentesis (>4 L/day) performed without intravenous albumin replacement (18%). RRT was initiated 7.7 (11.2) days after diagnosis of HRS. Intermittent haemodialysis was the most common modality of RRT (73.8%). The mean duration of RRT for one patient was 27.4 (52.5) hours. None of the patients survived. The mean survival time following the diagnosis of HRS was 18±2.9 days. Independent risk factors associated with decreased survival time were hepatitis C virus (HCV) infection, PaO2/FiO2 ≤164, mean arterial pressure (MAP) ≤70 mmHg, mechanical ventilation at the initiation of RRT, serum urea level >22 mmol/l, MELDNa score >26 ($p < 0.05$).
Conclusions: Almost two-thirds of HRS treated with RRT was associated with a precipitating factors. RRT was initiated 7.7 days after diagnosis of HRS. The mean survival time of patients following the diagnosis of HRS was 18 days. Independent risk factors for shorter survival time were HCV infection, low PaO2/FiO2 ratio, low MAP value, mechanical ventilation at the initiation of RRT, high serum urea level and high MELDNa score.
Recommendations: Prevention of HRS plays an important role in management of patients with LC since type I HRS is often associated with a precipitating factors and prognosis is poor. In ineligible for liver transplant and critically ill patients with HRS RRT does not provide an improved survival benefit. MELDNa score provides better short-term survival prediction than MELD for patients with type I HRS.
Keywords: hepatorenal syndrome, renal replacement therapy, haemodialysis.

EPIDEMIOLOGY OF RENAL REPLACEMENT THERAPY IN ESTONIA: THE INCIDENCE APPEARS TO HAVE PLATEAUED

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The purpose of the abstract was to give an overview of renal replacement therapy (RRT) statistics in Estonia during last 20 years.
Methods: The main RRT epidemiological data set included the patient's date of birth, gender, cause of renal failure, date of start of first RRT, history of RRT with dates and changes of modality, treatment centre, date and cause of death. Incidence, prevalence, mortality rate and survival were evaluated.
Results: The incidence of RRT has remained stable (less than 90 pmp) during already last eight years whereas prevalence of RRT continues to increase being 140 pmp in 1996, 193 pmp in 2000, 530 pmp in 2010 and 633 pmp in 2015. Kidney transplantation has been the main RRT therapy modality in Estonia already during last 20 years. During last five years transplanted patients formed more than 60% from all RRT patients. However, another trend has been noticed that peritoneal dialysis patient's numbers had decreasing tendency in all centres. Hypertension and diabetic nephropathy were the leading causes of end-stage kidney disease (ESKD) among incidence patients during last eight years whereas glomerulonephritis still and diabetes were the leading causes of ESKD among prevalent patients during last ten years. Incidence patient' population consists mainly of older patients in age groups starting from 35 years. More new RRT patients have appeared during last years among the age group >75 years. Mean age of incidence RRT patients increasing both among males and females being 61.3±17.0 and 63.0±15.0 years respectively at the end of 2014 but median age at the end of 2015 was 64.8±19.1 in females and 64.3±15.9 in males. Prevalent patient's total numbers have stayed almost similar during the years 2010-2013 but last years, 2014-2015, showed again the RRT numbers growth that maybe explained not much with the incidence change but with a lowering mortality. Mortality rate has continuously decreasing tendency during last six years being 15% in 2010 and 8% in 2015. The highest mortality rate has been among peritoneal dialysis patients group: being even 62% in 2010 and 52% in 2011 but only 10% in 2015. The lowest mortality rate has been among transplanted patients group: being 5% in 2011 and only 0.4% in 2015.
Conclusion: The incidence and prevalence of RRT patients remains lower in Estonia than that reported from the other European countries. However, from 2008 to 2015 the incidence rate pump has remained stable in Estonia and appears to have plateaued similarly to other Nordic countries.
Key words: renal replacement therapy, epidemiology.

ARE WE SHOOTING THE MESSENGER OR FIGHTING THE EVIL: PREVALENCE AND SIGNIFICANCE OF HYPERURICEMIA IN KIDNEY TRANSPLANT RECIPIENTS

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Background: Hyperuricemia is common among kidney transplant (KT) recipients but evidence regarding its association with maintenance immunosuppression, and influence on transplant function is still controversial. The aim of this retrospective study was to determine prevalence of hyperuricemia among KT recipients in Latvia, and analyze association between uric acid (UA) levels and its related factors.

Materials and methods: We analyzed data using statistical methods of 156 KT recipients of living and deceased donors in Pauls Stradins Clinical University Hospital, Transplantation Center of Latvia, transplanted in years 2012 to 2014. Hyperuricemia was defined as uric acid level of ≥416 μmol/L in men, and ≥357 μmol/L in women. Urate – lowering therapy and gout symptoms were not regarded.

Results: The median age of the KT recipients was 51±20 years; 51.9% were men, 75% had the first transplant. Only 9.8% had diabetes. Maintenance immunosuppression consisted of steroids, mycophenolate mofetil and cyclosporine in 66.7% of patients, tacrolimus – 23.7% and in 9.6% – cyclosporine was changed to tacrolimus. We found no difference in UA levels between groups with different primary diagnosis, tacrolimus or cyclosporine immunosupression, nor patients with or without diabetes. The prevalence of hyperuricemia prior to KT was 20.7% (95% CI:4;29), in the first month after KT – 20.9% (95% CI:0;21), 6 months after KT – 40.8% (95% CI:14;50), 1 year after KT – 49.6% (95% CI:25;61), 2 years after KT – 48.8% (95% CI:11;46). Patients with peritoneal dialysis prior to transplantation had more often hyperuricemia before KT comparing to haemodialysis (53.3% vs. 11.6%, $p<0.001$), but there was no significant difference between these groups after KT. Before transplantation women had hyperuricemia more often than men (33.3% vs. 8.8%, $p=0.002$), but there was no difference between these groups after KT. UA levels in the first month after transplantation had positive correlation with body weight ($p=0.003$). UA levels before transplantation did not correlate with UA levels after KT. UA levels in the first month after KT and 6 months after KT had positive correlation with UA levels at 1 and 2 years after KT ($p<0.001$). UA levels in the first month after KT had positive correlation with triglyceride (TG) levels at 1 and 2 years after KT ($p<0.001$). UA levels 6 months after KT had positive correlation with TG levels 2 years after KT ($p=0.003$). UA levels in the first month after KT had negative

correlation with GFR 1 year after KT (p=0.01). UA levels 6 months after KT had positive correlation with creatinine levels 1 year after KT (p=0.008). UA levels 1 year after KT had negative correlation with GFR 2 years after KT (p=0,006).
Conclusions: The prevalence of hyperuricemia is considerably high in KT candidates (20%). Hyperuricemia is more frequent among women and patients with peritoneal dialysis prior to transplantation. Prevalence of hyperuricemia is higher each year after transplantation. UA levels in the first month after transplantation were associated with metabolic parameters like higher triglycerides and body weight. Higher UA levels were associated with worse transplant function in following years after transplantation. There was no difference in UA levels between patients on tacrolimus or cyclosporine, or patients with different primary diagnosis.
Key words: uric acid, hyperuricemia, kidney transplant.

FROM DIARRHEA TILL HEMOLYTIC UREMIC SYNDROME AND MULTIPLE ORGAN DAMAGE

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Background: Hemolytic uremic syndrome (HUS) is one of the most common causes of community acquired acute kidney failure in young children. It is characterized by the triad: microangiopathic hemolytic anemia, thrombocytopenia and renal insufficiency. The most common etiological factor is *Shiga* toxin producing Enterohaemorrhagic *Escherichia coli* (EHEC) infection, which primary manifests with diarrhea. Life-threatening organ impairment develops in some cases, which might be connected with complement systems dysfunction.
Case report description: A 2 years old girl was hospitalized in Children's Clinical University Hospital. She had febrile temperature for 4 days, bloody diarrhea and abdominal pain. Laboratory results: WBC-21,66x103/uL, RBC-3,91x106/uL, HGB-11,2 g/dL, PLT-48x103/uL, CRP-20 mg/L. Diuresis was 70 ml in the next day of hospitalization, afterwards - completely anuria, which lasted more than 20 days. Automated Peritoneal Dialysis was started (Urea-23,49 mmol/l, Creatinine-365,46 mcmol/l, Glomerular filtration rate-11,9 ml/min/1,73m2 by *Schwartz* Equation, K-3,69 mmol/l) and used for 76 days. EHEC serotype O26, was found in the feces. *ADAMTS13*>96%. Diagnose "Hemolytic uremic syndrome" was made. She had nausea and vomiting, so she received nutrition through feeding tube. Due to severe arterial hypertension she received appropriate antihypertensive therapy. Elevated glucose level showed pancreas functional disturbance. Neurological description: behavioral disturbances, left side hemiparesis, muscle dystonia in the right side extremities, CT results - ischemic damages in the basal ganglia and brainstem.
Doctors' council was convened. According to development of severe complications, this HUS type might be connected with complement dysfunction. Based on the publications, the therapy of monoclonal antibodies *Eculizumab* was started. After that patients' neurological symptoms improved. She received *Eculizumab* 4 times. GFR was improved up to 27,2 ml/min/1,73m2 by *Schwartz* Equation, when patient was discharged from the hospital.
Discussion: HUS mostly develops as a result after STEC infection, which primary manifests with diarrhea. Approximately 25% of STEC–HUS patients show CNS involvement, other organ system impairments might develop. One of the reasons for that - complement hyperactivity. In such case *Eculizumab* is recommended. Laboratory analysis and clinical picture of presented 2 years old girl allowed to consider that diarrhea-associated HUS with multiple organ damage had developed. According to that, this HUS type might be connected with complement dysfunction. Therefor patient received therapy of *Eculizumab*, which made improvement in her neurological symptoms.
Key words: Hemolytic uremic syndrome, *Shiga* toxin-producing *Escherichia coli* (STEC), Acute kidney failure, Multiple organ damage.

HIGH SPECIFICITY TROPONIN INCREASE IN HEMODIALYSIS PATIENTS. VILNIUS CITY CLINICAL HOSPITAL DATA

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Background: Cardiac disease is the major cause of death in patients with end-stage renal disease, accounting for ~45% of all deaths. Diagnosing an acute coronary syndrome in these patients is often difficult because the troponin levels are increased in patients with renal failure in the absence of clinical myocardial ischemia symptoms.
Objective: 1. Assess the amount of high-sensitivity Troponin T in patients at Dialysis section of Vilnius City Clinical Hospital and in repetitive order take the examination after one year. 2. Compare Troponin T relation with blood test results, heart structural impairement and duration of hemodialysis.
Material and methods: Crossectional examination conducted on August of 2015 and 2016. Criteria for patient selection: stable, without acute coronary syndrome and without acute infection. Executed blood tests: blood serum cardiac high-sensivity Troponin T, creatinin, urea, potassium, C reactive protein, hemoglobin. High-sensivity Troponin T level was considered abnormal, if it was 15 ng per liter or higher. Subjects were divided into 5 groups by high-sensitivity Troponin T results: 1) 15 to 30 ng/l, 8 subjects (19,5%); 2) 31 to 60 ng/l, 10 subjects (24,4%); 3) 61 to 90 ng/l, 7 subjects (17,1%); 4) 91 to 120 ng/l, 6 subjects (14,6%) and 5) > 121 ng/l, 10 subjects (24,4%). Recent year echocardioscopy data was used to evaluate heart structural impairement: left ventricular ejection fraction, left ventricular systolic diameter, left ventricular diastolic diameter, interventricular septal diameter. Examination was conducted repeatedly after one year.
Results: The final analysis contained 41 patients. Gender distribution: 57,1 % (24) males and 40,5 % (17) women. The mean age was 66,7 years (SD - 13.6 years). Average amount of Troponin T: 92.2 ng/l (SD – 65.3 ng/l) in 2015 August and 83,8 ng/l (SD – 62,4 ng/l) in 2016 August. 11 (26,8 %) patients died and 2 (4,9 %) patients transplanted during the year. Statistically significant difference between Troponin T groups versus patient ages, duration of hemodialysis and laboratory values were not detected. However, it should be noted, that group containing the greatest amount of Troponin T (Group 5) provided most subjects with a suffered myocardial infarction before the trial – 66,7 % (4 of 6 cases) ($p=0.026$) and most cases of deaths were found in this group (6 of 11cases) ($p=0.08$) as well. Statistically significant ($p<0.05$), a moderate inverse relation (r -0.345) is obtained by comparing the level of high-sensivity Troponin T and left ventricular ejection fraction – decreases of left ventricular ejection fraction lead to a high-senstivity Troponin T increase.
Conclusions: 1. All chronic hemodialysis patients found with increased high-sensivity Troponin T level. 2. Patients with structural changes in the heart (reduced left ventricular fraction, myocardial infarction) have statistically significant increase of high-sensitivity Troponin T level and higher rate of death.
Key words: troponin, chronic kidney disease, hemodialysis, acute coronary syndrome.

HLA-A, HLA-B AND HLA-DR PHENOTYPE FREQUENCIES AMONG RENAL TRANSPLANT DONORS AND RECIPIENTS IN LATVIA

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Background: Human Leukocyte Antigen (HLA) genotyping is crucial for solid organ transplantation. HLA coding sequence is one of the most polymorphic, hence HLA genotype is extremely variable among different population. Till now no studies have examined HLA phenotype diversity in Latvian population undergoing renal allotransplantation.

Methods: We examined case files of 121 deceased and living kidney donors and their 173 kidney transplant recipients Latvia who were treated during 2013-2015 in Transplantation Center of Latvia. Due to incomplete information available 55 case files were excluded, so files of 105 donors and 134 recipients were analyzed. HLA phenotyping was done using microcytotoxicity test. We have analyzed frequencies (f) of HLA-A, HLA-B and HLA-DR phenotypes.

Results: Overall 20 different HLA-A phenotypes are identified. The most prevalent HLA-A phenotypes among all patient are A*02 (f=0,336), A*03 (f=0,148), A*24 (f=0,109), A*01 (f=0,100). In donor population the most prevalent phenotypes are A*02 (f=0,348), A*03 (f=0,143) and A*24 (f=0,129). In recipient population – A*02 (f=0,321), A*03 (f=0,153) and A*01 (f=0,108).

There are 34 HLA-B phenotypes identified, the most prevalent of them are B*07 (f=0,144), B*35 (f=0,117), B*44 (f=0,100). In donor population the most prevalent phenotypes are B*07 (f=0,143) and B*35 (f=0,109), but in recipient population – B*07 (f=0,145) and B*44 (f=0,104).

19 HLA-DR phenotypes are identified and the most frequent are DR*01 (f=0,136), DR*11 (f=0,136), DR*07 (f=0,134) and DR*13 (f=0,115). In donor population the most prevalent phenotypes are DR*11 (f=0,152), DR*01 (f=0,148), DR*07 (f=0,143) and DR*15 (f=0,133), but in recipient population – DR*13 (f=0,131), DR*01 (f=0,127), DR*07 (f=0,127) and DR*11 (f=0,123).

Conclusions: Our study provides the first data on the HLA-A, HLA-B and HLA-DR phenotype frequencies in Latvian population, in patients who donated kidney or who were organ recipient. Since in Latvia for cross-matching complement-dependent lymphocytotoxicity test is still used widely our data maybe applied for purchase of more specific antigen panels for tests, increasing specificity and sensitivity of test. That in future may lead to decrease of immunological complications among kidney recipients in perioperative and long term period.

Key words: HLA, kidney transplantation, genetics.

FREE FRACTION OF PROTEIN-BOUND UREMIC SOLUTES IN CASE OF DIFFERENT DIALYSIS MODALITIES

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Background: During hemodialysis, different uremic solutes have different removal properties. Among others, uremic toxins with known protein binding are one of the most difficult to remove as only free fraction of these toxins is available for removal. Therefore, to target the removal of certain uremic solutes with known protein binding, it is essential to have understanding about the solutes behaviour during different dialysis modalities.
Case description: The study included 10 stable hemodialysis patients (5 male, 5 female, average age 58,7 ± 15,7 years), each of whom was treated with 4 different dialysis modalities: hemodialysis (HD), hemodiafiltration (HDF) and 2 different hemofiltration (HF1 and HF2). Blood was sampled before and the right after the end of dialysis sessions. Total and free concentrations were determined of indoxyl sulfate (IS), tryptophan (Trp), indoleacetic acid (IAA), and hippuric acid (HA) by using high performance liquid chromatography (HPLC) system, and their free fraction in percentage (%FF) was calculated. All included uremic solutes are known to be mainly bond to albumin.
Results: For the blood samples drawn before the dialysis, there was no significant difference in %FF for any of studied uremic solutes (average %FF IS = 13 ± 5; Trp = 22 ± 7; IAA = 21 ± 6; HA 59 ± 9). For the blood samples drawn after the end of dialysis, %FF was significantly increased for all given indoles in case of HD (%FF before vs arter: IS 13 ± 5 vs 22 ± 9; Trp 23 ± 6 vs 44 ± 20; IAA 21 ± 6 vs 29 ± 10). Other modalitiesdid not show any significant changes in %FF, or %FF was decreased in the end of dialysis. However, for HA, %FF decreased significantly during all dialysis modalities.
Conclusion: This indicates to the possibility that during HD indolic compounds become more accessible at the end of the dialysis compared to other modalities. Also, these findings suggest that the availability of hippuric acid differs from that of the indolic compounds.
Key words: hemodialysis, uremic solute removal properties.

ESTIMATES AND PREDICTING FACTORS OF KINDEY FUNCTION ONE YEAR AFTER NEPHRECTOMY IN LIVING KIDNEY DONORS – LATVIAN TRANSPLANTATION CENTER EXPERIENCE

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Background: The published data on recovery of remaining kidney function after living donor (LD) nepherectomy are extensive, but not uniform. We summarize our twelve year experience in living donor surveilance after nephrectomy.
Methods: We analyzed 39 LD's who donated between 2004 and 2015 at the Latvian Transplantation Center. Glomerular filtration rate (GFR, ml/min; estimated by 4-variable MDRD formula) at 1 year after nephrectomy was the primary outcome. We compared living donors who had ≥30% decrease in GFR vs. those with ≤30% decrease in GFR at 1 year and constructed a logistic regression model to examine associations between this outcome and some pre-donation characteristics.
Results: Demographic and clinical characteristics of those with ≥30% decrease in GFR (n=21; 54%) vs. those with ≤30% decrease in GFR at 1 year are shown in Table 1. In addition, 5% (n=2) LD had ≥50% decrease in GFR at 1 year after nephrectomy.

Table 1. Demographic and clinical characteristics of the living donor population (n=39)

	≥30% decrease in GFR at 1 year (n=21)	≤30% decrease in GFR at 1 year (n=18)	P-value
Age at the time of donation (years) (mean±SD)	52.5±10.7	49.5±12.8	0.197
Male (%)	57	44	0.527
Smoker at the time of donation (%)	24	28	0.978
BMI at the time of donation (kg/m2) (mean±SD)	27.2±4.1	26.8±4.6	0.791
Proteinuria >250 mg/l one year after nephrectomy (%)	14	6	0.609
MAP at the time of donation (mmHg) (mean±SD)	101.4±8.2	94.8±7.5	0.015
Baseline GFR (ml/min) (mean±SD)	85.5±13.4	77.6±10.8	0.039
GFR at 1 year post-donation (ml/min) (mean±SD)	50.1±8.8	62.4±9.4	0.001

As shown above, in the LD group with ≥30% decrease in GFR at 1 year post-donation higher pre-donation MAP and higher pre-donation GFR were significantly associated with lower post-donation GFR ($p<0.05$). Variables with $p<0.2$ on univariate analyses (donor age, predonation MAP, and pre-donation GFR) were selected for the multivariate model. In binary logistic regression no variables were significantly associated with a ≥30% decrease in GFR at 1 year. Higher MAP at the time of donation was borderline predictive for lower post-donation GFR ($p=0,057$).
Conclusions: One year after nephrectomy, a substantial proportion of healthy kidney donors have persistently lower renal function. Higher pre-donation blood pressure could possibly be associated with a a ≥30% decrease in GFR at 1 year after donor nephrectomy. Longer term follow-up in LD is needed to assess the time course of renal function recovery.
Key words: living donor kidney transplantation, donor post-nephrectomy function.

RISK FACTORS FOR PERITONEAL DIALYSIS ASSOCIATED PERITONITIS

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Background and aim: Peritonitis remains an important peritoneal dialysis (PD) related complication nowadays. There has been a dramatic reduction in the incidence rate of PD-related peritonitis because of improved catheter and connection systems technologies and, most importantly, effective patient education.
Methods: This is a retrospective single-center study of 158 hospitalizations in patients with end stage renal disease and inserted PD catheters (n =80) during one year (2015). The data was collected from the Latvian Nephrology Centre inpatient database. Twelve patients for whom PD was not started and 13 with missing data were excluded from the analysis. A multivariate analysis was performed in study patients with peritonitis (group A) or without peritonitis (control group B). Variables included age, gender, concomitant disease - diabetes mellitus, body mass index [BMI], hemoglobin [Hb], potassium [K], phosphate [P], albumin [Alb], PD quality test [Kt/v], duration of PD in months, assistance for PD. The PD-related peritonitis risk (odds ratio, OR) was estimated using binary logistic regression analysis (SPSS 20.0 version for Mac). A p value ≤ 0.05 was considered statistically significant.
Results: A total of 55 PD patients (group A, n =17; group B, n =38) were analyzed. There is no statistically significant difference regarding the risk of peritonitis (OR) between unadjusted groups: 0.93, p =0.91 for old patients; 0.65, p =0.46 for males; 0.71, p =0.67 for diabetic patients; 0.52, p =0.38 for obesity (BMI >=30 kg/m2); 1.5, p =0.64 for anemic patients (Hb <12 g/dl for males and Hb <11 g/dl for females); 4.2, p =0.25 for patients with hypokalemia (K <3.5 mmol/l); 1.3, p =0.75 for patients with hyperphosphatemia (P >1.5 mmol/l); 1.8, p =0.47 for non-assisted PD patients; 2.7, p =0.12 for short time on PD (less than one year); 0.83, p =0.90 for hypoalbuminemia (Alb <35 g/l). Odds ratio for adequacy of PD (Kt/v >2) was 0.09 (p =0.02), but after adjustment for diabetes mellitus, obesity and PD length it was not significant (OR 0.09, p =0.07).
Conclusions: According to this study, there are no identified risk factors for PD-related peritonitis. Our study has following limitations: retrospective data, small number of patients, inadequate control group selection.
Keywords: peritoneal dialysis, peritonitis, risk factors for peritonitis.

VASCULAR CALCIFICATION AND BIOMARKERS IN HEMODIALYSIS PATIENTS WITH NOVEL CARDIOVASCULAR EVENTS

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Background: Hemodialysis (HD) patients are known to have significantly higher risk of cardiovascular (CV) mortality, which is not explained completely only by conventional risk factors. Vascular calcification (VC) is one of the factors associated with CV morbidity and mortality. VC is not any longer considered as passive process but rather as an actively regulated process dependent on calcification promotors and inhibitors such as FGF 23 and MGP.

The aim of the study: to evaluate possible relation between novel CV events in HD patients and biomarkers that may play role in pathogenesis of VC.

Objectives: to determine frequency of novel CV events in HD patients; to analyse frequency of VC in group with CV events and non-event group; to assess possible relationship between CV events and biomarkers levels in HD patients.

Methods: Demographical, clinical and biochemical data of prevalent HD patients in hospital of Lithuanian University of Health Sciences was collected from medical records and analysed. Evaluation of VC using simple vascular calcification score (SVCS) was performed as it is described by Adragao et al. with SVCS ≥3 considered as cut off value and tests of biomarkers FGF23 and inactive form of MGP were performed during 7 month period. Patients were observed for non-fatal CV events consisting coronary, cerebrovascular and peripheral vascular morbidity for 3 years. Age and HD vintage were evaluated on the day of VC assessment. For analysis patients were divided into groups: patients who experienced CV events during the follow up period and no CV event patients. Statistical analysis were performed using SPSS software package.

Results: Data of 76 patients (40(52.6%) male and 36 (47.4%) female) was analysed. 16 (21%) patients were diabetic. 15 (19.7%) experienced novel CV events during the follow up. SVCS≥3 was diagnosed in 45 patients (59.2%). Mean age -60.57±15.9 year and HD vintage-39.36±45.4 month. FGF 23 was 50.1±52.4 [1-314] ng/L and inactive MGP was 1.96±1.31 [0.41-7.32] ng/mL. FGF 23 was significantly higher in patients with novel CV events as compared to non - event group (58.55±82.2 vs 48.4±42.9, p=0.047). There was tendency for higher MGP levels in CV event group but the difference did not reach the level of significance (2.08±1.88 vs 1.93±1.14, p=0.07). There were no statisticaly significant differences between groups in age, HD vintage and frequency of diabetes. SVCS ≥3 was detected in 12 patients (80%) of CV event group and in 33 patients (54%) of non - event group, p=0.059.

Conclusions: One fifth of prevalent HD patients experienced the novel CV event during the 3 year follow up; Severe VC was detected in most of the patients with novel CV events; Levels of FGF23 were significantly higher in patients with novel CV events. Levels of MGP did not differ significantly.

Keywords: biomarkers, vascular calcification.

TOTAL REMOVED BETA 2-MICROGLOBULIN AND UREA DURING DIFFERENT DIALYSIS TREATMENT MODALITIES

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Introduction and aims: Beta 2-microglobulin (B2M) has been suggested to be an excellent marker for the middle molecule (MM) uremic toxins range and is proven to be a "real" uremic toxin with an independent impact on patient outcome (Canaud, Morena et al. 2006). The aim of this study was to compare the removal of urea and MM uremic solute B2M.
Methods: Eleven uremic patients, 5 males and 6 females, mean age 59 ± 15 years, were included into the study during 42 chronic midweek hemodialysis sessions in Centre of Nephrology, North Estonian Medical Centre, Estonia. Removal for a small uremic retention solute urea and for a MM uremic solute B2M was estimated during different dialysis modalities with different parameter settings:

1. Hemodialysis (HD) with low-flux dialyzer (FX8), blood flow (BF) 300 mL/min and dialysate flow (DF) 500 mL/min
2. High-flux hemodialysis with following parameter settings
    1. HFa, BF 300mL/min, DF 800 mL/min, dialyzer FX1000
    2. HFb, BF 350mL/min, DF 500 mL/min, dialyzer FX1000
3. Postdilutional online hemodiafiltration (HDF), BF 350mL/min, DF 800 mL/min, substitution volume >19L, dialyzer FX1000

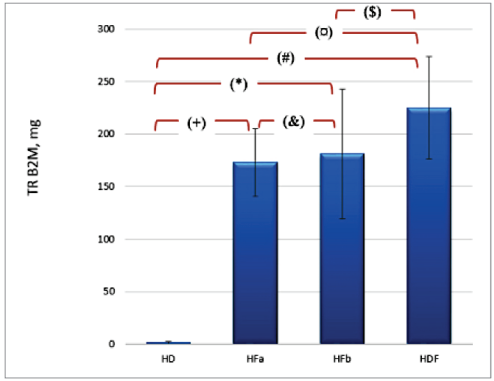
All treatments lasted 240 min. After the end of the procedure, dialysate collection tank was weighed and one sample (Tank) was taken from it after careful stirring. The concentrations of urea and B2M in collected tank samples were determined.
The total removal (TR) of a substance was calculated as follows:

$$TR = C_T * W_T$$

where CT is the substance concentration in total dialysate collection tank and WT is the weight of the dialysate collection tank (kg). It was assumed that 1 kg = 1 liter of the dialysate. Paired student t-test was used for determining statistically significant differences ($P < 0.05$).

Results:

A)



B)

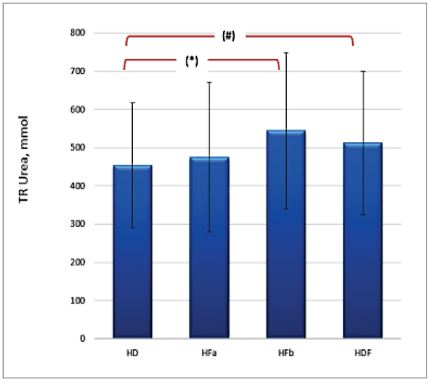


Figure1. A: In case of B2M statistically significant differences for pair-wise comparisons were NOT identified only in case of HFa vs. HFb(&), all other TR B2M values between modalities showed significant difference: HD vs.HFa(+), HD vs.HFb(*), HD vs.HDF (#), HFa vs.HDF(¤), HFb vs.HDF($).
Figure1. B: In case of urea significant differences were found in case of HD vs.HDF(#) and HD vs.HFb(*).

Conclusions: The study suggests that treatment settings are affecting the removal of B2M and these results could be taken into consideration while pursuing more effective dialysis in the terms of removal of MM uremic toxins.
Keywords: Beta 2-microglobulin, hemodialysis, total removal.

HYDRATION STATUS ASSESSMENT IN PERITONEAL DIALYSIS PATIENTS USING BIOIMPEDANCE ANALYSIS

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Introduction: Euvolemia is an important adequacy parameter in peritoneal dialysis patients. Overhydration in hemodialysis (HD) and peritoneal dialysis (PD) patients is associated with increased cardiovascular risk, heart failure progression, and overall mortality. Several methods of volume status evaluation exist: clinical, laboratory, radiologic examination, and bioimpedance spectroscopy.
Aim of this study is to assess volume status of PD patients and PD-associated outcomes: clinical parameters (arterial pressure (AP), ultrafiltration (UF)), switching to other mode of renal replacement therapy during three years follow-up.
Materials and methods: This is an international, prospective, cohort study of incident PD patients, who started PD from 01.01.2012 till 31.12.2012. Study follow-up period – 4 years. Clinical examination data, laboratory kidney function tests were analyzed, bioimpedance spectroscopy was performed with the Body Composition Monitor (*Fresenius Medical Care*) every 3 months.
Results: 17 patients from P.Stradins Hospital Nephrology Center were included throughout one year. There were overall 120 visits till 31 December 2015. Over the time 9 patients were transplanted, 3 died, 1 discontinued the study, 1 was switched to HD, and 3 patients finished the study. Mean age: 61.3 ± 15.5 years. Men - 41.2%, women - 58.8%. Further first 7 visits were analyzed, when number of patients was more than 8. Clinical parameters: mean UF – 1047±517 ml, diuresis – 1061±355 ml, APsis – 149,4±24,4 mmHg un APdias – 88,7±14,0 mmHg. There are no changes in UF and diuresis amount over the time, while glomerular filtration rate decreases. According to bioimpedance 44% patients were normohydrated (-1,0L līdz 1,0L), 5% dehydrated, 22% with relative (1,0-2,5L) un 29% with absolute overhydration (>2,5L fluid overload). Mean overhydration value 1,8±2,6L. Higher hydration status is associated with increased APsis (p=0,06, R=0,32). Higher Apsis and APdias follow the increase in total body water volume (p<0,0001).
Conclusions: Overhydration is frequent among PD patients. Volume status should be normalized first before intensification of antihypertensive therapy. Bioimpedance spectroscopy is a fast and non-invasive method for hydration status assessment.
Keywords: bioimpedance; hydration status; peritoneal dialysis.

PHYSICAL ACTIVITY AND QUALITY OF LIFE IN PATIENTS WITH CHRONIC KIDNEY DISEASE. A CROSS-SECTIONAL STUDY IN ESTONIA

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Background: The aim was to investigate health-related quality of life (HRQoL) and physical activity (PA) in patients (pts) with chronic kidney disease (CKD).
We hypothesised that patients (pts) with lowered kidney function (eGFR < 45 ml/min) will report about noticeably lower health quality and PA levels in everyday life in comparison with pts with eGFR>45 ml/min and/or pts with chronic conditions (CC).
Methods: A cross-sectional design with 705 consecutive pts (294 male and 411 female, age range 20–88 years) at primary health care centres and the university hospital in Estonia assessed HRQoL through SF-36 and PA level (MET-mins/week) by International Physical Activity Questionnaire (IPAQ). The patient's age, gender, education, BMI, smoking and alcohol consumption status were used as independent variables to predict PA and the physical (PCS) and mental component score (MCS) of HRQoL. CKD pts with eGFR >45 and < 45 ml/min were divided to evaluate different stages of CKD separately. Other study groups consisted of pts having one or more other CC (osteoarthritis, chronic back pain, rheumatoid arthritis, 2 type diabetes, and cardiovascular diseases) and control pts without CC.
Results: CKD pts with eGFR< 45 ml/min had significantly lower HRQoL scores (both PCS and MCS) compared with other groups ($p < 0.0001$). There were no statistically significant differences in distribution of PA levels between CKD and CC pts ($p = 0.08$) as well between CKD pts and controls ($p > 0.9$). No differences when compared CKD pts with eGFR >45 and < 45 ml/min ($p > 0.9$) were found, but in CC pts compared with controls we found higher PA ($p = 0.026$). HRQoL scores (both PCS and MCS) were strongly influenced by age and education but not by PA level in CKD pts. Interestingly in the patients with eGFR<45ml/min who reported about good walking habits we found it statistically significantly connected with higher PCS.
Conclusions: CKD pts with eGFR< 45 ml/min value their mental and physical life quality significantly lower as pts with eGFR>45 ml/min, pts with CC or control pts. PA level according to IPAQ is similar among CKD pts irrespectively of the kidney function. Walking impacts positively life quality in CKD patients with eGFR<45ml/min.
Key words: chronic kidney disease, quality of life, physical activity.

FIRST-YEAR RENAL GRAFT SURVIVAL: WHICH FACTORS PLAY THE MAIN ROLE?

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Background: The number of patients with end stage renal disease and request of kidney transplantation is growing. This leads to rising interest of research in the area of factors that could prolong graft long-term outcomes and survival. First-year post-transplant renal function may have an influence on long-term survival. In 2013, 28 p.m.p. kidney transplantations were performed in Lithuania. In our country around 90 percent of kidney transplantations are from deceased donors. All cadaveric donors, whose kidneys we transplanted, were prepared in our center of transplantation.
Methods: We analyzed the impact of donor and recipient factors and histological findings on time-zero biopsies on graft function for 186 renal transplant patients. In our center baseline biopsy findings were not used discard deceased donor kidneys, therefore our results reflect complete amplitude of donor kidney morphology. Time – zero biopsies were evaluated using the 2007 Banff criteria. Renal transplant function was evaluated by the presence of delayed graft function (DGF), estimated glomerular filtration rate (eGFR) and graft survival 1 year after transplantation.
Results: Any grade of tubular atrophy (TA), interstitial fibrosis (IF), arteriosclerosis (AS) and arteriolar hyalinosis (AH) was observed in 10.7%, 2.8%, 39.7% and 43.5%, respectively. The majority of abnormal histologic findings were of mild degree (grade I) according to the Banff criteria. Dissimilarity of degree of glomerulosclerosis (GS), IF and AH were significant in inferior and superior renal function groups (GS >20% 11.4 vs 0 percent, p=0,017; IF 9.3 vs 0 percent, p=0,034; AH 69 vs 26.2 percent, p<0.001). The donors and recipients were older in worse eGFR group 1 year after transplantation. Nine independent variables were significantly associated with worse renal transplant function 1 year post-transplantation (AH (OR=6.287, p<0.001), episode of urinary tract infection (OR = 2.769, p=0.020), acute graft rejection (OR = 3.605, p=0.037), expanded criteria donor (OR= 4.987, p=0.001), female gender donors (OR= 3.00, p=0.014), cerebrovascular disease caused donor brain death (OR =5.00, p=0.001), donor's age (OR 1.07, p<0.001), recipient's age (OR 1.047, p=0.022)). Factors associated with more than 20 percent of glomerulosclerosis in time-zero biopsy were donor age (p=0.004), positive history of hypertension (p=0.037), expanded criteria donor (p=0.029), donor brain death caused by cerebrovascular disease (p=0.040), acute graft rejection (early post-transplant period) (p=0.002). Worse renal graft survival 1-year post-transplantation was associated with delayed graft function and higher level of glomerulosclerosis in time-zero biopsy.

Conclusions: Elder donor and recipient age, donor female gender, expanded criteria donor status, donor brain death of cerebrovascular cause, no history of recipient's diabetes, urinary tract infection and acute graft rejection episodes after transplantation had significant negative impact on renal graft function 1 year after transplantation. Kidneys with higher degree of glomerulosclerosis were associated with acute rejection episodes in early post-transplant period and worse 1-year graft-survival. Moreover, lower 1-year transplant survival was related with delayed graft function after transplantation.
Key-words: kidney transplantation, graft survival, cadaveric, time-zero biopsy, core needle.

MINERAL BONE DISEASE AMONG PATIENTS WITH NEW ONSET DIABETES AFTER RENAL TRANSPLANTATION

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Background: Both types of diabetes mellitus influence alterations within bone material in hemodialysis patients. However little is known about the effects of new onset diabetes after transplantation (NODAT) on bone metabolism. Therefore we aimed to investigate the impact of NODAT on laboratory parameters related to chronic kidney disease – mineral bone disorders (CKD-MBD).
Methods: Medical records of 308 adult patients who underwent renal transplantation at our center between January 2005 and December 2014 were retrospectively reviewed. Patients included into the study had no previous glucose intolerance or diabetes, no history of parathyroidectomy, were followed-up for at least 12 months. 21 patients met criteria for NODAT diagnosis according to American Diabetes Association (ADA). We selected one age, sex and eGFR matched control patients without diabetes for each NODAT patient to obtain a new cohort of 42 patients. We selected them by computerization leading to least possibility of bias. Patients' serum calcium (Ca), phosphorus (P) and PTH, creatinine concentrations were determined before and at regular intervals after transplantation.
Results: NODAT was diagnosed for 21 patients (6.81%) after 10.1 ± 25.2 months. During the first year there were no differences in P and PTH concentrations between patients with and without NODAT (0.98 ± 0.7 mmol/l vs 0.95 ± 0.14mmol/l and 49.3 ± 14.4 vs 21.2 ± 29.8), whereas Ca concentration was significantly higher. After 5 years Ca and P concentrations among NODAT patients were lower (1.43 ± 0.171 mmol/l and 0.81 ± 0.176 mmol/l vs 2.243 ± 0.121 mmol/l and 1.406 ± 0.115 mmol/l, $p < 0.05$). PTH remained lower compared to control ($p>0.05$). Stratified by CKD stage Ca concentration remained lower and decreased as renal function declined among NODAT patients. The opposite effect in control group was observed. P concentration tended to rise as renal function declined in both groups. Itself changes in BMF parameters had no additional effect on renal survival in multiple regression model.
Conclusions: NODAT is serious and common complication following renal transplantation. Previously reported to increase mortality, graft failure and diabetes associated complications. We state evidence linking NODAT with bone metabolism changes occurring late after kidney transplantation.
Keywords: renal transplantation, new onset diabetes after transplantation, mineral bone disorders.

ESTONIAN HEALTH INSURANCE FUND EXPENDITURES FOR PERSONS WITH END-STAGE KIDNEY DISEASE

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Background: Health insurance in Estonia is organised by the Estonian Health Insurance Fund (EHIF). The Estonian Health Insurance Fund is the only organisation in Estonia dealing with compulsory health insurance. The abstract covers the majority of EHIF beneficiaries with end-stage kidney disease ESKD. The purpose of the study was to analyse costs of ESKD by patient diagnosis.
Methods: Descriptive statistics based on EHIF data files of expenditures for persons with ESKD on dialysis.
Results: The Health Insurance Fund covers the vast majority of medically related costs, but to some extent is provided a co-payment from the patient. These include, for example for an appointment and per diem charges. The average cost of a treatment case has grown in all treatment types. Among ESKD patients the increase of the cost of treatment case was found in all renal replacement therapy (RRT) types and annual cost was also increased both in hemodialysis (HD, from 18197 EUR in 2010 to 21099 EUR in 2015) and in peritoneal dialysis (PD) patients (from 12173 EUR in 2010 to 14447 EUR in 2015). In comparison of mean cost of treatment with the treatment cost in diabetics we found that the cost was slightly higher: in HD 21998 EUR and in PD 14738 EUR (2015 data).
Conclusions: Peritoneal dialysis is generally reimbursed at a lower level than hemodialysis. The cost of treatment in dialysis is higher in diabetics.
Key words: end-stage renal disease, treatment costs.

PREDICTORS OF TREATMENT SUCCESS IN ANTIBODY - MEDIATED REJECTION AFTER KIDNEY TRANSPLANTATION

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Background: Current evidence indicates that antibody - mediated rejection is a leading cause of kidney graft failure. Patients who experience acute/active antibody–mediated rejection (ABMR) can respond or not respond to standard treatment. The **aim** of the study was to assess the factors that would predict treatment responsiveness.

Material and Methods: We retrospectively studied 156 patients who received kidney allografts at Paul Stradins Clinical University hospital between 2013 and 2015. ABMR was diagnosed by clinical manifestations and histological assessment of transplant biopsy (revised Banff 2013) at early post transplant period (< 3 months). Diagnostics of donor specific antibodies is still not available in Latvia. Two patients died (severe haemorrhage; aspergillosis) in the first months after operation and were excluded from further analysis. Patients were categorized as non-responders to treatment if eGFR was < 30 ml/min (MDRD calculation) at 6 months after initiation of ABMR treatment. Maintenance immunosuppression consisted of tacrolimus, mycophenolate mofetil and steroids. The treatment of ABMR included pulse methylprednisolone +/- ATG, single dose (500mg) of rituximab and 5 sessions of plasma exchange. P values were determined with use of Fisher's exact test for categorical variables and the Mann-Whitney U test for continuous variables.

Results: Acute rejection was biopsy proved in 31 patients during 3 years. Pure T cell mediated rejection was diagnosed in 9 cases (5-2013, 3-2014, 1-2015), whereas ABMR in 22 cases (6-2013, 9-2014, 7-2015). The ABMR analysis included 20 patients. 14 (70%) of them were responders (R) to treatment with median eGFR 47,5 ml/min and 6 (30%) were non-responders (NR) with median eGFR 24 ml/min at 6 months post-transplant. Kaplan-Meier estimates of graft survival at 1 year were 100% in responders group and 66% at non-responders group. Baseline characteristics were comparable for R and NR groups, respectively, median age 42 *vs* 43,5 years (p=0,3), diabetic nephropathy 4(28%) *vs* 0 cases (p=0,27) as primary disease, living donor 3(18%) *vs* 0 cases (p=0,5), first kidney allograft 9(64%) *vs* 1(16%) (p=0,07), prior transplantectomy 4(28%) *vs* 4(66%) (p=0,16), delayed graft function 5(35%) *vs* 2(33%) (p=1,0), except females were dominant (83%) in NR group without statistical significance. Immunological characteristics were not significant and were following: number of HLA mismatches 6 (range 3-6) *vs* 5 (range 4-6), panel reactive antibodies median 30% *vs*

25%, patients with presensitization (PRA >10%) 28% *vs* 66%, rejection time - median 8 *vs* 9,5 days after operation and concomitant T-cell mediated rejection in 2(14%) *vs* 1(16%) cases. Analyzed immunosuppressive therapy were: induction with ATG 2(14%) *vs* 4(66%) cases (p=0,04), level of tacrolimus at transplant biopsy day 8,0 *vs* 5,9 ng/ml (p=0,08), ABMR treatment with ATG 9 (64%) *vs* 2 (33%) cases (p=0,34). None of histological features were predictive for treatment responsiveness, respectively: glomerulitis 35% *vs* 33%, interstitial inflammation 26% *vs* 50%, tubulitis 7% *vs* 16%, peritubular capilaritis 57% *vs* 33%, C4d graft deposition 75% *vs* 55%.
Conclusions: The total incidence of acute rejection is decreasing but incidence of ABMR is increasing. The tendency for unresponsiveness to standard ABMR treatment was in female recipients of deceased donor organs, admitted for retransplantation with lower tacrolimus levels and who received ATG for induction but did not received it for ABMR treatment. Although clinically some factors seems to be predictive for unresponsiveness to ABMR treatment larger studies are needed to confirm statistical significance.
Key words: kidney transplantation, antibody-mediated rejection, standard treatment.

BACTERIOPHAGES AS POTENTIAL TREATMENT FOR INFECTIONS IN *S.AUREUS* COLONISED NEPHROLOGICAL PATIENTS: AN *IN VITRO* STUDY

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Background: *Staphylococcus aureus* is an opportunistic pathogen that can cause both acute and chronic wound, tissue as well foreign body-related infections. It is one of the most common causative agents of infection in hemodialysis and peritoneal dialysis (PD) patients. Colonization of *S.aureus* has a great importance in the development of *S.aureus* infection. Due to rising antimicrobial resistance there is an urgent need to develop new methods to fight against multi-drug resistant bacteria. Bacteriophage therapy is a promising method to treat and prevent bacterial infections.
Objective: To investigate the effect of bacteriophage on *S.aureus* strains isolated from nasal and inguinal swabs from patients admitted to Pauls Stradiņš Clinical University Hospital Nephrology centre.
Material and methods: Nasal and inguinal swabs were obtained from patients admitted to Nephrology centre between February and August 2016 on 6 separate days. Microbiological analysis was performed after overnight swab culturing on trypticase soya broth on mannitol-salt agar, egg-yolk-salt agar, blood agar. Coagulase detection was performed, isolated bacteria were identified according to standard procedures. Results were confirmed with VITEK-2 (bioMerieux) system. The susceptibility testing was performed according to the EUCAST Version 4.0, 2016. Screening of susceptibility to bacteriophage was performed by using a spot test method. Centrifuged bacteriophage lysate from *"Sekstofag", Mikrogen* were used. Phage effect was identified by plaque visual morphology. The positive reaction was classified as confluent lysis (CL), semi-confluent lysis (SCL), overgrown lysis (OL). The negative reaction was classified as no lysis, i.e., resistant (R).
Results: Overall, 77 patients were included in this study. 50.6% (n=39) were female and 49.4% (n=38) were male. Twenty one of patients (27.3%) were colonized with *S.aureus* (VITEK-2 error rate ranged from 93-99%). Colonization of *S.aureus* in nasal cavity and inguinal regions were found in 7 patients, only in nasal cavity in 10 patients, only in inguinal region in 4 patients, in total we isolated 28 *S.aureus* strains. None of the isolated strains were MRSA (methicillin resistant *S.aureus*), two strains were resistant to erythromycin. All of the isolated strains (100%, n=28) were susceptible to bacteriophage, although there were different degrees of effectiveness, CL was found in 3 reactions, SCL was found in 15 reactions, OL was found in 10 reactions. The most effective phage lytic activity is

CL showing clear lysis zone, indicating that during incubation period (20 h) bacteria could not develop bacteriophage resistance. Spots with SCL and OL reflect less lytic activity, which could be explained by different bacterial concentration after incubation.
Conclusions: Bacteriophages have a great lytic potential against isolated *S.aureus* strains. To increase the degree of phage lytic activity bacterium-bacteriophage adaptation could be used in further studies. More studies, especially *in vivo* and clinical studies, should be performed to understand possible use of phages in infection treatment. In larger cohort it may be seen that screening from both - nasal and inguinal sites is more informative, especially in peritoneal dialysis where colonization of *S.aureus* should be treated to avoid PD-related infection.
Keywords: MRSA screening, *S.aureus* colonization, bacteriophages, dialysis-related infections.

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