XXXIII конгресс Международного Общества Очищения Крови (ISBP)

Тезисы докладов

ISBP Congress

Abstracts

Frequency of sick euthyroid syndrome in patients with end stage renal disease

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Aim: Abnormalities in thyroid hormone levels in the absence of underlying thyroid disease can be found in case of acute or severe illness. The aim of this study was to evaluate the frequency of sick euthyroid syndrome in patients with end stage renal disease (ESRD).

Materials and methods: A total of 181 patients from both genders, with a minimum age of 18 years old, and with ESRD were enrolled in this retrospective study. Patients with a diagnosis of acute illness and chronic disease other than ESRD were excluded. Patients were divided into two groups. One group included 100 patients who were undergoing hemodialysis. The other group included 81 patients who were undergoing peritoneal dialysis. Demographic properties and serum TSH, FT3, FT4 levels of the patients were recorded from their hospital files. Patients with a normal TSH level with low FT3 level and patients with a normal TSH level with low FT3 and FT4 levels were considered as sick euthyroid syndrome. MedCalc 12.7 software program was used for statisitical analysis. Chi square was used to compare categorical measures between the groups. Independent group t test was used for comparison of quantitative measurements between the two groups.

Results: The groups were matched according to the gender (p=0.333). Hemodialysis patients were older than peritoneal dialysis patients (51.3±16.4 vs. 46±15.3, p=0.02). The mean TSH, FT3, FT4 levels were 1.78±2.15, 2.45±0.56, 1.09±0.22, respectively in hemodialysis group while they were 2.89±3.37, 2.48±0.68, 1.19±0.72, respectively in peritoneal dialysis group. There was a significant difference between TSH levels (p<0.001). FT3 and FT4 levels were comparable (p=0.074, 0.713, respectively). There were 117 (64.6%) patients with sick euthyroid syndrome. It was found in 68 (68%) of hemodialysis patients, and in 49 (60.4%) of peritoneal dialysis patients. There was no statistical significant difference between frequencies of sick euthyroid syndrome (p=0.371).

Conclusion: Sick euthyroid syndrome is a common disorder in patients with ESRD. Abnormalities in thyroid hormone levels, in the absence of underlying thyroid disease, can be found in patients with ESRD due to the release of cytokines such as IL-6. Treatment of these hormone abnormalities is not a necassary, but they should be controlled during recovery. Unless a thyroid disorder strongly suspected, the routine testing of thyroid function should be avoided in patients with ESRD.

Keywords: sick euthyroid syndrome, end stage renal disease, hemodialysis, peritoneal dialysis

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Homocysteine level in patients with chronic kidney disease

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Aim: Homocysteine is a sulfur-containing amino acid which forms during the metabolism of methionine. The level of homocysteine is vary according to the populations but generally high in men and in old

age. Elevated serum levels of total homocysteine are toxic to vascular endothelium, including endothelial dysfunction, and contribute to the development of atherosclerosis. Chronic kidney disease is a progressive loss in renal function over a period of months or years. It has become an important public health problem because of its increasing prevalence, chronic nature and serious complications. Atherosclerosis is common in patients with chronic kidney disease. The aim of this study was to evaluate the level of serum homocysteine level in patients with chronic kidney disease.

Methods: This case-control study was carried out in the internal medicine outpatient clinics of Adana Numune Training and Research Hospital. A total of 67 subjects from both genders, with a minimum age of 18 years old, were included. The study group was comprised of 32 patients with chronic kidney disease and the control group was comprised of 35 healthy subjects. Patients with a diagnosis of chronic disease other than chronic kidney disease and taking medicines that effect on homocysteine level were excluded. Homocysteine, creatinine clearance, vitamin B12 and folate levels were measured. The MedCalc 12.7 software (Belgium) was used for all statistical analyses. T test or Mann Whitney U test was used for the comparison of the quantitative measurements between the two groups. Chi-square test was used to test the statistical significance of differences in frequencies.

Results: Groups were matched in terms of age, sex, vitamin B12 and folate ($p>0.05$, for each). There was statistically significant difference between creatinine clearance levels of the groups. Creatinine clearance levels of the subjects were 17.5 ± 7.1 and 86.2 ± 15.6 in the study and control groups, respectively ($p<0.001$). Serum homocysteine level was higher in patients with chronic kidney disease. The mean homocysteine levels were 16.9 ± 6.9 and 13.6 ± 5.2, respectively, and there was a statistically significant difference between the study and control groups ($p=0.002$).

Conclusion: In this study we investigated serum homocysteine levels in patients with chronic kidney disease. We have shown that serum homocysteine levels were higher in patients with chronic kidney disease. High homocysteine level behaves as an independent and strong risk factor for cardiovascular disease. Homocysteine damages the inner linings of the arteries and promotes thrombosis through pathological collagen activation of the intrinsic pathway, impairment of thrombolysis, increased production of hydrogen peroxide, endothelial dysfunction, and increased oxidation of low-density lipoproteins. Increased atherosclerosis and cardiovascular diseases in patients with chronic kidney disease may be associated with high homocysteine levels. Nevertheless, we need further studies.

Keywords: homocysteine, chronic kidney disease, atherosclerosis

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Removing A/B antibodies by immunosorbtion in ABO-incompatible living donor kidney transplantation

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Bacground: Immunologic status is a limitation to living donor tranpslantation. ABO-incompatibility is the main barrier to organ transplants because of the allograft antibody mediated rejection. To prevent rebound, immunosorbtion is combined with immunosuppressive therapy. The donor specific antibody levels are monitored and transplantation performed when the anti A/B are sufficiently reduced.

Methods: Selective immunoglobulins sorbtions with „ABO Adsopak“ are performed using an extracorporeal plasma circulation system „ADAsorb“ and automatic blood cell separators „Cobe Spectra“, „Spectra Optia“. The columns should be applied to the plasma line after plasma separation. This system is based on a column containing immobilized A and B oligosaccharides.

Results: 2010-2014 years 9 ABO-incompatible living donor kidney transplantations have been performed and 54 immunosorbtions conducted in our hospital. This process normally takes 14-21 days.

Table 1

Patient number	Antibody before sorbtions	Antibody after sorbtions	Transplantations data
1	1:64	1:2	2012.12.05
2	1:32	1:2	2012.08.24
3	1:64	1:2	2012.07.20
4	1:32	1:4	2012.06.15
5	1:8	1:4	2011.11.10
6	1:8	1:4	2010.11.10
7	1:64	1:4	2013.07.18
8	1:128	0	2014.04.09
9	1:8	1:2	2014.05.06

Table 2

Patient number	Sorbtion number	Plasma sorbtion volume (ml) average during one procedure	Duration of one procedure average (min.)
1	7	2932	177
2	12	5524	305
3	9	4713	283
4	5	4186	233
5	4	3309	308
6	6	3355	372
7	7	3642	204
8	1	3572	270
9	3	2825	267

Conclusion: Current desensitization protocols are all based on the same principles – to remove anti A/B antibodies and to prevent rebound of antibodies in the kidney recipient after transplantation. Our data suggest that immunosobtion with „ABO Adsopak“ is a rational, effective and safe therapy.

Keywords: A/B antibodies, immunoadsorbtion, ABO-incompatible living donor, kidney transplantation

The preventive role of rifaximin in fructose induced nephrotoxicity

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In recent years increased fructose consumption; has been associated with increased prevalence of metabolic syndrome that characterized by obesity, insulin resistance, dyslipidemia and hypertension. In the studies, with the purchase of fructose; glomerular hypertension, renal inflammation and tubulointerstitial damage and nephrotoxicity reported. Giving a long time fructose causes an increase in kidney weight. Firstly, focal tubular damage especially in the proximal tubules, tubular hyperplasia and proliferation develops. Fructose intake causes an increase in inflammatory pathway. Rifaximin is an antibiotic which has minimal systemic effects and it is not absorbed from gastrointestinal tract. Rifaximin has been found effective. Rifaximin has been found effective in hepatic encephalopathy and recently in the treatment of irritable bowel syndrome. Rifaximin is effective by inhibiting bacterial translocation and making bacterial decontamination. In this study we aimed to investigate the preventive role of rifaximin in an experimental model of nephrotoxicity that created with fructose.

A total of 42 male Sprague-Dawley rats were used in this study. The rats were divided into 6 groups of equal number: Group 1 (n=7): Normal diet was given for 8 weeks, Group 2 (n=7): High-fructose diet (30% fructose to be added to drinking water) was given for 8 weeks, Group 3 (n=7): High fructose diet + once a week rifaximin with orogastric sonde for 8 weeks, Group 4 (n=7), 3 days a week rifaximin with orogastric sonde for 8 weeks, Group 5 (n=7): Normal diet + once a week rifaximin with orogastric sonde for 8 weeks, Group 6 (n=7) 3 days a week rifaximin with orogastric sonde for 8 weeks was given (Rifaximin 15 mg/kg dose administered).

High-fructose diet histologically induced tubular dilatation and hydropic degeneration in the epitelium of tubule, caused a decrease in glomerular size. While there was no significant difference in serum urea and creati-

nine, uric acid levels increased intake of fructose. The dose-dependent rifaximin simultaneously, turning back to tubular and glomerular changes and decreased uric acid levels.

Significant increase in tissue levels of malondialdehyde (MDA),TNF-α and NF-ϰB was observed in rats feeded with fructose rich diet ($p<0.05$). This increase was significantly decreased dose-dependently with added rifaximin to this diet ($p<0.05$). A significant decrease in tissue levels of Nrf-2, CAT, SOD, HO-1, GSP-x and GSH was observed in rats feeded with fructose rich diet compared to control group ($p<0.05$). This decrease was significantly increased dose-dependently with added rifaximin to this diet ($p<0.05$).

Our data showed that fructose causes oxidative stress and kidney injury. In conclusion, we determined that rifaximin can prevent fructose induced nephrotoxicity.

Keywords: fructose, nephrotoxicity, metabolic syndrome, rifaximin

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Venous access pressure monitoring as a predictor of arteriovenous fistula failing

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Background: Stenosis and secondary AV fistula thrombosis are the most frequent complications of arterio-venous access for haemodialysis. The well-known disadvantages and potential dangers of CVC for haemodialysis should be a sufficient reason for consequent access surveillance in order to identify and treat every significant stenosis before thrombosis occurs[1,2]. The aim of our study was to measure the venous access pressure in the hemodialysis patients and offer the new predictor of AV fistula thrombosis. We hypothesized that increased venous access pressure during the haemodialisys could be a significant predictor of arteriovenous fistula pathology.

Methods: The data of 34 patients who underwent haemodialysis during six months were analysed. Surveillance strategies were mainly based on measurement of venous access pressure (VAP). As the changes in arterial pressure (MAP) affect the level of VAP, the ratio of VAP to MAP (Coefficient of venous access pressure (VAPR)=VAP/SBP+1/3DBP) was used for diagnosis of access stenosis. A VAPR >0.55 was considered to be a sign of significant stenosis.

Results: 403 investigations were made during six months. The data in the form factor calculation VAPR of each hemodialysis session were analysed, as well as the determination of the dependence of the coefficient values VAPR on the duration of the existence of arteriovenous fistula (AVF). The individual graphs were created for each patient for easier visual analysing of VAPR variations. We have also divided our patients into two groups: the control group consisted of 16 patients with less than 2 years old AVF, the study group consisted of 18 patients with functioning AVF for two and more years.During this investigation we have found out the increasing of VAPR in the study group with functioning AVF for two and more years.

Conclusions: Our pilot investigations has shown that venous access pressure monitoring probably could de used as predictor of AVF failing and we should continue our researching work for finding out referental ranges for coefficient of venous access pressure.

Keywords: coefficient of venous access pressure, AV fistula stenosis

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Visualizing connecting force between cannula and luer connector used in hemodialysis bloodlines

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Background: Venous needle dislodgement (VND) may be fatal because the needle delivers the cleansed blood from the hemodialysis machine back into the patient. Disconnection from a cannula line connected by luer taper fitting has also the same implications as VND. A cannula involved silicon hemostasis valve using spring force is used in recent years in Japan. As a male luer taper connector is used in connection with this cannula, there needs enough force to connect against the spring force. As incidents related with this bloodlines were reported, we try to measure and visualize the connecting force between cannula and luer connector.

Objective: We evaluate the connecting force between cannula and luer connector by nursing and clinical engineering staffs in a dialysis unit.

Methods: Using mechanical force gauge (Aikoh Engineering Model-RX20: 220×68×43 mm, 500 g), we measured the maximum static connecting force between cannula with silicon valve and male luer connector among 6 nursing and 6 clinical engineer (CE) staffs. Each staff had three trials. Using six-axis force sensor (Leptrino CFS018CA201U: φ18×H26 mm, 20 g with USB interface), we measured time-series connecting force during connection between cannula and luer connector. The measurements with 7 CEs were digitally recorded with 600 Hz sampling period and six-axis data which consisted of three-axis force and three-axis torque (moment of force) data.

Results: The connecting force using force gauge was as follows: nursing staffs were 10.3±0.80 newton (N) and CE staffs were 14.8±1.94 N, in which the range was from 6.6 to 21.5 N. The measurement using six-axis force sensor showed the importance of torque with time series changes and the removal force with torque of 10 N•cm could easily make disconnection.

Conclusion: Mechanical force gauge can only measure one-axis static force, however, six-axis force sensor can measure three-axis force and three-axis torque with time-series changes. Using six-axis sensor, we could evaluate human connecting force with not only x-y-z axis force but each torque. These data shows the difference of time-series fitting characteristics between staffs.

Keywords: hemodialysis, fitting force, luer, cannula, six-axis force sensor

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Visualization of clinical practice of hemodialysis and its application to incident analysis

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Background: Recently, accidents caused by hemodialysis machines have decreased due to advances of mechanical engineering. However, there are still many incidents such as wrong machine setting. A workflow can visualize the outline of clinical practice of hemodialysis. In addition, it is useful for modification of clinical process, introduction of new process, standardization of clinical practice, and staff education for reducing incident. There is little cost to develop a workflow.

Objective: In order to reduce incident and provide safer practice in hemodialysis, we analyzed the clinical practice and constructed a workflow for hemodialysis and the relationship between the workflow and the associated incidents reported in a hemodialysis unit. We visualized the result as a workflow with incidents and investigated whether it is available to education, practical process improvement, and standardization.

Methods: This is a retrospective study of analyzing 231 incidents reported by clinical engineer (CE) and nurse from 2011 to 2014 at a hemodialysis unit with 40 beds. Based on the knowledge of an expert CE and manuals, we analysed the clinical practice around hemodialysis and classified it to major processes, and constructed the workflow of the clinical process of hemodialysis in Microsoft Excel, and mapped the incidents on it.

Results: We analyzed clinical practice by classifying hemodialysis operation into five major processes which were ordering, logistic, preparation and execution process. It was clearly seen on the workflow that staffs need many information about related

items such as biomedical materials and medications. The analysis of the incidents of a hemodialysis unit compared with the workflow showed that 93% of 231 incidents could be set up to the workflow and there were some focused areas of relating incidents. These results showed that the workflow which clearly showed the occurrence of incidents was effective to take appropriate measures.

Conclusion: Using the workflow diagram, it is possible to express the relationship of each process to be performed, which enables the visualization of manual without expression of words. As there was interpolated relationship between incidents and workflow, we could deepen the workflow with the related incidents. By mapping incidents on the workflow, it becomes possible to use it for education.

Keywords: workflow, incident analysis, visualization, hemodialysis

Role of Morphogenetic Proteins – FGF-23, soluble alfa-Klotho in Vascular Calcification in Patients with Chronic Kidney Disease

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The aim of the study was to investigate the relationship between FGF-23, Klotho serum level changes and diffuse arterial stiffness, calcification intensity and myocardial remodelling in patients with different stages of Chronic Kidney Disease (CKD).

Materials and Methods: 130 patients with CKD I-VD stage were included in the study: 30-with chronic glomerulonephritis, 23-tubulointerstitial nephritis, 22-multicystic kidney disease, 28-hypertensive nephrosclerosis, 27-diabetes (64 men and 66 women, aged 20-65 years, mean age at enrollment was 41±6,7 years).

The control group consisted of 30 volunteers the same average age and sex. Serum FGF-23 (Human FGF-23 ELISA kit using monoclonal antibodies to the full FGF-23 molecule), Klotho (Human alpha-Kl ELISA using anti-Klotho antibodies) levels were applied in these patients. Blood pressure (BP) was measured to all study patients. Echocardiography was performed to patients with arterial hypertension and left ventricular mass index (LVMI) was calculated. The state of blood flow in the heart and large vessels (Doppler ultrasound Echocardiography), pulse wave velocity and vascular wall functional ability (Sphigmokor), calcifications presence (echocardiography, X-rays of the abdominal aorta by Kauppila method) were studied.

Results: A strong direct correlation [r=0,731; p<0,01] was established between CKD stages and serum FGF-23 levels, inverse correlations [r=–0,489; p<0,01] were established between CKD stages and Klotho levels. When comparing serum FGF-23 and Klotho levels in patients with different CKD stages was found the changing its levels as increasing CKD severity, ahead of serum phosphorus and parathyroid hormone (PTH) levels elevating, starting at CKD III A stage.

We assessed the serum morphogenetic proteins levels changes depending on BP levels and central (aortal) BP levels . The degree of increasing blood pressure and central systolic BP correlated inversely with Klotho concentrations [r=–0,687; p<0,01].

In the same time, it was found the feedback between enhanced FGF-23 serum levels with increased left ventricular mass [r=0,452; p<0,05]. In hypertensive patients (n=44) this connection was extremely expressed [r=0,850; p<0,05].

We also established the strong reverse relationship of serum Klotho levels [r=-0,537; p<0,01] with pulse valve reflection time (Sphigmokor).

In studied patients reduced serum Klotho level has been clearly associated with a higher frequency of calcificat identification in the heart valves (Echocardiography) and large arteries (abdominal aorta) [r=-0,525; p<0,01 and r=-0,684].

Reduced serum Klotho and increased FGF-23 levels have been also associated with a concentric remodeling of the myocardium [r =-0,445 p<0,01 and r=-0,567].

Conclusion: Our study has demonstrated that serum levels of Klothoand FGF-23 are early markers of cardiovascular eventsin CKD. It was found the clear link between increased serum FGF-23 and decreased Klotho as increasing CKD severity, and diffuse arterial stiffness and calcification, myocardial remodelling independent of traditional risk factors.

Acknowledgments: This work was supported by the Russian Science Foundation (grant № 14-15-00947 2014 year).

Keywords: chronic kidney disease, ectopic calcification, fibroblast growth factor-23, left ventricular hypertrophy, soluble alpha-Klotho

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Clinical impacts of acetate-free dialysate

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Objective: Recently, acetate-free citrate containing dialysate (A(-)D) started to be distributed in Japan. The aim of this study is to assess clinical effects of the dialysate switch from acetate containing dialysate (A(+)D) to A(-)D in hemodialysis patients.

Method: This is a non controlled before-after trial. 84 maintenance hemodialysis patients were enrolled in this study. All patients were treated with A(+)D from June 2009 to December 2010, and then followed by the switch to A(-)D until June 2012. We compared the pre-change follow-up data with post-change data (frequency of intra-dialysis hypotention, degree of subjective symptoms assessed by a self scored scale, nutritional status evaluated by MIS(1), calcification of aortic arch estimated by AoACS(2).

Results: The frequency of intra-dialysis hypotension and the degree of subjective symptoms were not changed. The nutritional status was well maintained in all follow-up periods in spite of aging. The calcification of aortic arch was worsened with time during observation period. However, the calcification rate was decelerated after the dialysate switch to A(-)D (AoACS score change rate: 1.04%/year vs. 0.60%/year).

Discussion: Acetic acid in A(+)D is considered as a cause of micro-inflammation in patients receiving hemodialysis. Recently A(-)D was marketed in Japan and used in a lot of dialysis center. However, some expert physicians give warning that there might be a risk of rapid vascular calcification associated with A(-)D because of their strong alkalization effect. In this study, we couldn't find the risk of vascular calcification compared with A(+)D. And then there were no adverse effects on nutrition. Alkalization effects are very important to maintain their homeostasis for these patients with renal failure. Beneficial effects to intra-dialysis hypotension and subjective symptoms were not recognized.

Conclusion: These results suggest that hemodialysis using A(-)D contributes to preventing vascular calcification and leading to maintenance of good nutrition. Further researches are required to find the mechanisms of beneficial effect of A(-)D.

Keywords: acetate free dialysate, calcification, nutrition

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Clinical efficacy of super high-flux hemodialysis in patients with septic shock

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Septic shock is a most dangerous form or SIRS according with high frequency of multiorgan failure and high mortality. Big group of pro-inflammatory and anti-inflammatory mediators can be described as a pathogenetic substance of septic shock. There are some methods of extraction of pro-inflammatory cytokines (the main sepsis mediators) using in septic shock therapy. The removal of cytokines by standard hemofiltration is limited. That`s why 'super high-flux' membranes have been developed to increase the clearance of inflammatory mediators.

Objectives: The main objective was to evaluate clinical efficacy of super high-flux membranes in septic shock patients in continuous veno-venous hemodialysis model.

Patients and Methods: A retrospective review of 19 septic shock patients who received super high-flux continuous veno-venous hemodialysis (SHF CVVHD) was performed; both of them had surgical deceases (peritonitis n=11 (58%), pancreonecrosis n=4 (21%), cholangitis n=4 (21%)). The diagnosis «septic shock» was based on ACCP/SCCM criteria. The causative organisms for sepsis were gram positive (n=3,16%), gram negative (n=15,89%), mixed gram positive and negative (n=1,5%). Both of patients had an acute kidney injury ('failure' according RIFLE).

All patients were treated according to the Surviving Sepsis Campaign – 2013 recommendations. SHF CVVHD was started as soon as possible (6-12 hours from the beginning of shock).

SHF CVVHD was performed using the «MultiFiltrate» device (Fresenius, Germany) with a blood flow rate of 160-180 mL/min, dialisation rate of 1500-2000 ml/h. As a super high-flux membrane we used Ultraflux EMiC2 Dialyser (1.8 m^2 surface area, Fresenius Polysulfone membrane, cutoff value 40 kDa). Durating of SHF CVVHD procedure was 22-28 hours.

Results: We detected some positive effects of SHF CVVHD in early haemodynamic stability and a reduction in inotropic support requirement (MAP 69.4±12.8 mm Hg the treatment, 77.2±16.8 mm Hg after; norepinefrine 0.15±0.04 mcg/kg/min before, 0.05±0.002 mcg/kg/min after, dopamine 10.2±6.5 mcg/kg/min before, 6.1±4.8 mcg/kg/min after), in respiratory indicators (PaO2/FIO2 before 232±69, 309±44 after the treatment), serum creatinine (reduction in 34.3-48.2%), procalcitonine levels. We detected increasing of the glomerular filtration rate (15.3%). The APACHE 2 score reduced from 22-24 to 15-17; the SOFA score reduced from 17-20 to 10-13. We also found the lower levels of pro-inflammatory cytokines in blood (TNF-α – 28.4%, IL-1 31.9%, IL-6 26.3%, IL-10 21.8%) and the higher levels of anti-inflammatory factors (IL-4 – 19.7%, sIL-6R – 23.8%).

Conclusions: using super high-flux membranes even in hemodialysis model is an effective and safe method of extracorporal septic shock therapy. The research should be prolonged.

Keywords: sepsis, cytokines, super high-flux membranes, hemodialysis

Clinical efficacy of coupled plasma filtration and adsorption (CPFA) in patients with septic shock

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Septic shock is a most dangerous form or SIRS. Big group of pro-inflammatory and anti-inflammatory mediators can be described as a pathogenetic substance of septic shock. That`s why coupled plasma filtration and adsorption (CPFA) which adsorbs both pro-inflammatory and anti-inflammatory mediators from filtered plasma is a pathogenic-focused extracorporeal blood purification therapy in septic shock.

Objectives: The main objective was to review our clinical experience with CPFA in septic shock patients.

Patients and Methods: A retrospective review of 21 septic shock patients who received CPFA was performed; both of them had surgical deceases (peritonitis n=13 (62%), pancreonecrosis n=5 (24%), mediastinitis n=3 (14%)). The diagnosis «septic shock» was based on ACCP/SCCM criteria. The causative organisms for sepsis were gram positive (n=4,19%), gram negative (n=15, 72%), mixed gram positive and negative (n=2,9%).

All patients were treated according to the Surviving Sepsis Campaign – 2013 recommendations. CPFA was started as soon as possible (6-12 hours from the beginning of shock).

CPFA was performed using the «Lynda» device (Bellco, Italy) with a blood flow rate of 180-200 mL/min, ultrafiltration rate of 35 mL/kg/h, and plasma flow rate was 20% of blood flow rate (35-40 mL/min). Durating of CPFA procedure was 18-22 hours. The volume of plasma averaged 0.21-0.24 l/kg.

Results: We detected some positive effects of CPFA in early haemodynamic stability and a reduction in inotropic support requirement (MAP 71.2±10.4 mm Hg the treatment, 85.3±15.7 mm Hg after; norepinefrine 0.11±0.06 mcg/kg/min before, 0.03±0.004 mcg/kg/min after, dopamine 14.3±4.8 mcg/kg/min before, 4.1±3.0 mcg/kg/min after), in respiratory indicators (PaO2/FIO2 before 202±84, 244±88 after the treatment), serum bilirubine (reduction in 24.3-37.1 %), procalcitonine, creatinine (reduction in 36.1-45.4%) levels. The APACHE 2 score reduced from 21-25 to 14-17; the SOFA score reduced from 14-16 to 9-11.We also found the lower levels of pro-inflammatory cytokines in blood (TNF-α – 21.3%, IL-1 25.4%, IL-6 27.8%, IL-10 19.4%).

Conclusions: CPFA is an effective and safe method of extracorporal septic shock therapy. The research should be prolonged.

Keywords: sepsis, CPFA, cytokines

Effects of Single-pass Albumin Dialysis (SPAD) in Patients with Hepatorenal Dysfunction

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Background: In Vitro Comparison of the Molecular Adsorbent Recirculation System (MARS) and Single-pass Albumin Dialysis (SPAD) showed that detoxification capacity of SPAD is similar to or even greater than that of MARS [1].

Case report 1. 77-years-old female with nephrosclerosis had progressing hepatorenal dysfunction after an episode of hypotension and arrhythmias. The basic levels of total and direct bilirubin were in normal range, serum creatinine – 137 μmol/L before admission.

On the second day after admission, in spite of conservative therapy there were hyperbilirubinemia (total bilirubin – 87.6 μmol/L, direct – 76.7 μmol/L), increasing of serum creatinine – 225.42 μmol/L. SPAD initiated before pacemaker implantation and atrio-ventricular node ablation.

To obtain the albumin dialysate solution for use in SPAD: 1000 mL human albumin 10% were mixed with 4000 mL dialysis solution for hemofiltration; the result was an albumin solution of 2.5%. The same standard dialysis solution was used in the hemodiafiltration circuit. The albumin solution passed the filter at a rate of 1000 mL/h; substitute rate was at 2000 mL/h with ultrafiltration rate 0.0 ml/hour. 1 SPAD session was carried out for 5 hours, then 2 hemodiafiltration procedures were conveneced with intervals of two days.

Case report 2. A 30-years-old female with hepatorenal dysfunction after bleeding in early postpartum period (PP). The basic levels of total, direct bilirubin and serum creatinine were in normal range. On the first day of PP hyperbilirubinemia was progressing (total bilirubin 165-367 μmol/L, direct – 118-303 μmol/L), serum creatinine increased till 133 μmol/L.

Initial extracorporeal hemocorrection therapy included 2 session of therapeutic plasma exchange on 1st and 2d PP days. SPAD was started on 5th PP day. Before SPAD total bilirubin – 117 μmol/L, direct – 105 μmol/L, serum creatinine increased till 218 μmol/L).

To obtain the albumin dialysate solution for use in SPAD: 2000 mL human albumin 10% were mixed with 8000 mL dialysis solution for hemofiltration; the result was an albumin solution of 2.5%. The same standard dialysis solution was used in the hemodiafiltration circuit. The albumin solution passed the filter at a rate of 1000 mL/h; substitute rate was at 1800-2000 mL/h with ultrafiltration rate 0.0 ml/hour. 1 SPAD sessions were carried out for 10 hours and were alternated with 4 hours of hemodiafiltration. Total time of procedure was 14:45 hours/min.

Results: In the first case after procedures total bilirubin decreased till 58.6 μmol/L and direct till 47.8 μmol/L, creatinine – 157.3 μmol/L. In 10 days after SPAD total bilirubin reached 34.1 μmol/L and direct – 27.3 μmol/L, serum creatinine – 158.2 μmol/L.

In the second case after procedures total bilirubin decreased till 105 μmol/L and direct till 71 μmol/L, creatinine – 66.6 μmol/L.

Conclusions: This cases showed the effectiveness of SPAD early initiation in patients with hepatorenal disfunction. Procedure doesn't need expensive additional equipment and disposables.

Keywords: Single-pass Albumin Dialysis (SPAD), hepato-renal dysfunction, hyperbilirubinemia, hemodiafiltration, albumin dialysat

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Chronic kidney disease patients self-reported health-related quality of life, physical activity and alcohol consumption

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Background: Poor quality of life and low physical activity of chronic kidney disease (CKD) patients may impact social and emotional behaviour and determine the efficacy of nutritional and lifestyle counselling. Although association between alcohol consumption and risk for CKD has been reported, some recent studies showed that light alcohol consumption does not increase the risk of CKD and is inversely associated with

CKD progression.

Objective: The purpose of the study was to compare and analyse the self-reported health-related quality of life (HRQOL), physical activity (PA) and alcohol consumption of CKD patients depending on kidney function.

Material and methods: We conducted an observational, cross-sectional study in 119 CKD pts (median age 58.6 years). Patients divided into 2 groups depending on eGFR: 58% had estimated glomerular filtration rate (eGFR) <45 ml/min/1.73 m^2 including also dialysis patients. The following research tools were used: (1) HRQOL was measured in a cohort of CKD pts Medical Outcomes Study 36 – the Short Form (SF-36 v.1); (2) IPAQ (International Physical Activity Questionnaire); and (3) AUDIT (The Alcohol Use Disorders Identification Test). Statistical analyses were the following: Mann-Whitney U-, Kolmogorov-Smirnov- and Spearman correlation tests. Dispersion analysis was used to evaluate the impact of kidney function on HRQOL and alcohol consumption. The relevance level was $p<0.05$.

Results: According to SF-36 and IPAQ data we found statistically significant inverse association between eGFR and physical and emotional functioning: in lower kidney function patients group limitations in emotional role functioning ($p=0.010$), mental ($p=0.023$) and physical ($p=0.048$) components score were assessed lower and correlation analysis revealed statistically significant correlation between general health and eGFR ($p=0.040$). Using correlation analysis the negative association between alcohol consumption and age was found. Additionally we found that evaluation of HRQOL was higher in patients with higher AUDIT score. Dispersion analysis showed the association between general health, physical activity and alcohol consumption ($p<0.0001$) irrespective of kidney function.

Conclusions: Patients with lower eGFR reported worse general health and lower mental and physical component score. These patients, who evaluated general health higher, were physically more active too. People with light alcohol consumption assessed general health, physical component score and social role functioning higher independently of kidney function.

Keywords: chronic kidney disease, kidney function, quality of life, physical activity, alcohol consumption

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Influence of traditional cardio nephroprotective therapy on markers of cardiovascular risk (FGF-23, Klotho) in Patients with Chronic Kidney Disease

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The aim of the study was to evaluate the influence of the traditional cardio-nephroprotective therapy on serum markers of cardiovascular risk (FGF-23, Klotho) in CKD patients.

Materials and Methods: 130 patients with CKD I-VD stage were included in the study: 30-with chronic glomerulonephritis, 23-chronic tubulointerstitial nephritis, 28-hypertensive nephrosclerosis, 22-multicystic kidney disease, 27- type II diabetes (64 men and 66 women, aged 20-65 years, mean age at enrollment was 41±6,7 years).

Serum FGF-23 levels (Human FGF-23 ELISA kit using monoclonal antibodies to the full FGF-23 molecule), serum alpha-Klotho (Human alpha-Kl ELISA). To evaluate the effect of therapy, patients were divided into groups: 1- CKD I-IIIA, 2- CKD3B-4 and 3- CKD 5-5D st .

Results: In group 1, we evaluated the effects of an-

tihypertensive therapy. The highest Klotho levels were observed in patients, whose target values of blood pressure were achieved with the help of angiotensin receptor blockers and angiotensin converting enzyme inhibitors (ACE) compared with those who used other groups of drugs or unreached target blood pressure levels ($p<0,01$)

In group 2 it was evaluated the effects of low-protein diet with low phosphate content (<800 mg/day) in combination with keto/amino acids drugs (ketosteril). It was shown that patients used a low-protein diet with low phosphate content, balanced amino/keto acids, had higher Klotho and lower FGF-23 levels ($p<0,05$ and $p<0,01$ respectively). In addition, patients 2nd and 3rd groups who achieved and maintain a target Hb level (120 g/l) with help of ESA + iron intravenously also had higher Klotho levels than patients who drugs to improve Hb used irregularly and who remained anemia.

Patients from the 2nd and 3rd groups who used to reduce the level of PTH selective activators of vit D receptors – VDR- (zemplar) recorded higher levels of Klotho in serum as compared with patients who use non-selective VDR ($p<0,01$).

Patients from the 2nd and 3rd groups, who used low phosphate diet in combination with phosphate binders (calcium carbonate, renagel) to reduce the level of serum phosphate and reached the target serum level of phosphate (serum phosphorus less than 1.62 mmol/L) serum FGF-23 and PTH were statistically lower than that in patients with elevated phosphate levels ($p<0,01$ and $p<0,01$ respectively).

At the same time it was shown that predialysis patients with corrected hyperphosphatemia and anemia have lower cardiovascular complications risk (RR=0,95 versus 1,10, 95% DI; $p<0,01$), need for hospitalization ($r=0,457$; $p<0,01$) and better survival during the first year of hemodialysis.

Conclusion: The study showed the possibility of practical use of FGF-23 and Klotho as an early diagnostic marker of cardiovascular risk and that adequate correction of their changes started in predialysis CKD can be initiated to reduce the risk of cardiovascular complications and increase the survival of patients with CKD in general.

Acknowledgments: This work was supported by the Russian Science Foundation (grant № 14-15-00947 2014 year).

Keywords: serum FGF-23, serum alpha-Klotho, chronic kidney disease, cardio-nephroprotective therapy, cardiovascular complications, low-protein diet, selective activators of vit D receptors, low phosphate diet, phosphate binders

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Role of Morphogenetic Proteins – FGF-23, soluble alfa-Klotho in Vascular Calcification in Patients with Chronic Kidney Disease

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The aim of the study was to investigate the relationship between FGF-23 and Klotho serum level changes and diffuse arterial stiffness, calcification intensity and myocardial remodelling in patients with different stages of Chronic Kidney Disease (CKD).

Materials and Methods: 130 patients with CKD I-VD stage were included in the study: 30-with chronic glomerulonephritis, 23-chronic tubulointerstitial nephritis, 28-hypertensive nephrosclerosis, 22-multicystic kidney disease, 27-type II diabetes (64 men and 66 women, aged 20-65 years, mean age at enrollment was 41±6,7 years).

The control group consisted of 30 volunteers the same average age and sex. Serum FGF-23 levels (Human FGF-23 ELISA kit using monoclonal antibodies to the full FGF-23 molecule), Klotho (Human alpha-Kl ELISA using anti-Klotho antibodies) were applied in these patients. Blood pressure (BP) was measured to all study patients. Echocardiography was performed to patients with arterial hypertension and left ventricular

mass index (LVMI) was calculated. The state of blood flow in the heart and large vessels (Doppler ultrasound Echocardiography), pulse wave velocity and vascular wall functional ability (Sphigmokor), calcifications presence (echocardiography, X-rays of the abdominal aorta by Kauppila method) were studied.

Results: A strong direct correlation [r=0,731, p<0,01] was established between CKD stages and serum FGF-23 levels, inverse correlations [r=–0,489, p<0,01] were established between CKD stages and Klotho levels respectively. When comparing serum FGF-23, Klotho levels in patients with different CKD stages was found the changing its levels as increasing CKD severity, ahead of serum phosphorus and parathyroid hormone (PTH) levels elevating, starting at CKD III a stage, whereas hyperphosphatemia and increased PTH levels were started to change in CKD IV-V stage.

We assessed the serum morphogenetic proteins levels changes depending on BP levels and central(aortal) BP levels (Sphigmokor). The degree of increasing blood pressure and central systolic BP correlated inversely with Klotho concentrations [r=-0,687; p<0,01].

In addition, it was found the feedback between enhanced FGF-23 levels with increased left ventricular mass [r=0,452; p<0,05].

We also established the strong reverse relationship of serum Klotho levels [r=-0,537; p<0,01] with time of pulse valve reflection (Sphigmokor).

In studied patients reduced serum Klotho level have been clearly associated with a higher frequency of calcificat identification in the heart valves (Echocardiography) and large arteries (abdominal aorta) [r=-0,525; p<0,01 and r=-0,684].

Reduced serum Klotho levels and increased FGF-23 levels have been also associated with a concentric remodeling of the myocardium [r=-0,445; p<0,01 and r=0,567].

Conclusion: Our study demonstrated that serum levels of Klotho, FGF-23 are early markers of cardiovascular events in CKD. It was found the clear link between increased serum FGF-23 and decreased Klotho as increasing CKD severity, and diffuse arterial stiffness and calcification, myocardial remodelling independent of traditional risk factors.

Acknowledgments: This work was supported by the Russian Science Foundation (grant № 14-15-00947 2014 year).

Keywords: chronic kidney disease, ectopic calcification, fibroblast growth factor-23, left ventricular hypertrophy, soluble alpha-Klotho, cardiovascular events, myocardial remodelling

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Efficiensy of plasmadsorbtion (Liver Support) in patients with mechanical jaundice complicated with liver falure

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New methods of extracorporal blood correction and detoxification in condition of liver failure of patients with mechanical jaundice need an assessment of their efficiency and safety, especially against initial hypocoagulation and system introduction of heparin.

Research objective: assessment of efficiency of plasma adsorption on Plasorba BR-350 and its influence on the condition of blood coagulation system of patients with mechanical jaundice.

Materials and methods: The research is conducted for 12 patients aged 47-67 with the mechanical jaundice developed as a result of biliary obstruction (choledocholithiasis). Initial level of general bilirubin was from 285 μmol/l to 589 μmol/l. The Liver Support procedures were carried out on the Octa Nova device, manufactured by Asahi Kasei Medical, Japan, with use of Plasorba BR-350 sorbent developed on the basis of anion-exchange resin for plasma sorption. Each patient had three procedures with processing of one volume of plasma circulation per procedure. One procedure was carried out just before operation (one day before), and another two – in the postoperative period. The duration of procedure averaged 2 hrs 05 min. The blood flow rate was 130-160 ml/min. The plasma flow rate was 25-

30 ml/min. Anticoagulation was ensured by washing the bloodlines and a column with a sorbent with normal saline with heparin – 4000 units of activity per 1 L. 5000 units of activity of heparin were injected intravenously at the beginning of procedure. The biochemical values and coagulogram test results of patients were studied prior to procedure, during procedure and upon termination of procedure.

Results: The definite decrease in level of general bilirubin by 18,6±3,8%, decrease in conjugated bilirubin by 14,6±6,4% and indirect bilirubin by 16,9±9,8% by the end of procedure was noted. The study throughout the treatment did not show the decrease in dynamics of hemoglobin and platelets. There was no negative dynamics in change of INR (international normalized ratio), APTT (activated partial thromboplastin time), level of fibrinogen, prothrombin, anti-thrombin III. No bleeding complication occurred in any patient during the procedure of plasma sorption. Other biochemical values did not change significantly.

Conclusions: The researches showed that Liver Support plasma adsorption is effective in condition of mechanical jaundice as a detoxication method. Based on the lack of bleeding complications in patients during the procedure and lack of changes in coagulogram after the procedure, this liver supporting method can be recommended for patients with high level of bilirubin in condition of mechanical jaundice at the stages of preparation for operational treatment of the bile ducts obstruction and in the postoperative period.

Keywords: liver support, Plasorba, mechanical jaundice, liver falure, plasma adsorption

Urinary neutrophil gelatinase associated lipocalin as potential predictor of activity lupus nephritis – class IV: prospective study

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Objective: The aim of this study was to observe the potential role of urinary Neutrophil Gelatinase-associated Lipocalin (u/NGAL) as biomarker of activity disease in patients with Lupus Nephritis (LN) – Class IV. We compared the level of u/NGAL and standard parameters of disease activity.

Methods: We observed 40 patients with biopsy-proven LN – Class IV (F 33/7 M; mean age 40.5±14, 05 years). Patients were divided in two groups of 20, according to activity of LN – active LN, and LN in remission. Groups were homogeneous by gender, age, body weight, and therapeutic modality. Monitoring parameters were: creatinine/s, albumin/s, C3, C4, ANA, anti ds-DNA antibodies, SLEDAI/r score, proteinuria, urinary protein/creatinine ratio-Up/Cr, uNGAL. We compared the parameters of groups in 3 visits over 2 months. All patients had creatinine clearance ≥60 ml/min. U/NGAL was determined by CMIA immunochemical test (commercial kits of Abbott Diagnostic on ARCHITECT® i2000 SR).

Results: We found that the level of u/NGAL was significantly higher in urine of patients with active proliferative LN, than those with LN in remission (p=0,000). A statistically significant difference (p<0.001) was observed for the comparison of anti dsDNA antibodies, proteinuria, Up/cr, SLEDAI/r scores, between these two groups of rounds. In the active group, urinary NGAL level significantly correlated with albumin/s (p<0,05), C3 (p<0,05), anti Ds-DNA ab (p<0,001. U/NGAL level also significantly correlated with SLEDAI /r (p<0,05), proteinuria (p<0,001), Up/cr (p<0,001). The values of the area under the ROC curve suggested sensitivity of 95% and 100% specificity expressed in u/ NGAL.

Conclusions: We noticed that the level of u/NGAL is closely correlated with the disease activity: the level was increased in patients with active LN – class IV, than in patients with LN in remission, which indicates the potential importance of level determination in these patients.

Keywords: lupus nephritis, proteinuria, activity, urinary biomarker

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Nephrotic syndrome in elderly patients – our experience

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Aims: The appearance of the nephrotic syndrome (NS) with elderly patients is usually caused by different types of glomerulopathies.The aim of the sudy is, to present the elderly patients with the nephrotic syndrome, as well as the characteristics of this serious disease, bearing in mind that there are differences comparing to other population.

Methods: Group of 30 patients over 60 years old, with nephrotic syndroma is observed in the retrospective study, in the period of – 2012-2014 years. (M 19 (63,3%)/11(36,6%) F; mean age 67,2±7,1 years). Kidney biopsy was done in order to verification the renal histopathological lesions, using optimal therapy and monitoring treatment effects.

Results: In 3 – year period, in the group of 132 patients with renal lesion where the kidney biopsy was performed, in 51 (38,6%) patients , the nephrotic syndrome was noticed.

30 of them (58,8%) was over 60 years old. With 22 (73,3%) patients, this examination proved the primary glomerulonefritis (GN) and with 8 (26,6%), secondary GN.By the pathohistological analysis, the most present GN was the membranous (MN) with 14 patients (63,3%), focal-segmental GN (FSGS) which was found with 4 patients (18,1%), and mesangioproliferative GN was found with 4 (18,1%) patients too. Neither one had joined malignant disease. In the group of 8 patients (26,6%) with the secondary GN, 3 patients (37,5%), had diabetic nephropathy, lupus nefritis 1 patient (12,5%) and vaskulitis 4 (50%). The patients were treated (except for patients with DM)with immunosuppressive therapy (corticosteroids, cyclophosphamide, azathioprine). The complete remission is noticed with 68% patients, partial response with 21%, and 8% showed resistance to the therapy.

Conclusions: We present a group of elderly patients, in which the nephrotic syndrome was most frequently caused by primary glomerulonephritis. It is a serious illness which should be pathohistological verified and the treatment should start as soon as possible.

Keywords: glomerulonephritis, proteinuria, treatment, nephrotic syndrome

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An Intricate Case of Hemodialysed Patient with Extrapulmonary Lymph Nodes Tuberculosis

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Introduction: Tuberculosis lymphadenitis is the most common form of extrapulmonary tuberculosis. 50% of extrapulmonar location are represented by tuberculosis of lymph nodes. In the absence of pulmonary tuberculosis, ganglionary involvement makes the diagnosis to be difficult and tardive, delaying the onset of the treatment. Mediastinum lymph nodes location compel us to the differential diagnosis with: sarcoidosis, carcinoma, sarcoma, lymphomas, infectious adenitis, collagen or sistemic diseases.

Case presentation: A 63 years old woman, type 2 diabetics with insulin, chronic hepatitis B, diabetic nephropaty with chronic kidney disease (CKD) in hemodialysis (HD) was referred one year ago with nonspecific pulmonary symptoms (cough, dyspneea) and disphagya. The X-ray detected large left superior mediastinum and chest CT – scan highlighted polylobulate left paraaortic mass with necrosis tendency, in relation to large mediastinum vessels. Multiple tumoral biopsy emphasized sarcoidosis (Ziehl-Nielsen initial coloration was negative). After initiation of corticosteroids (preceded by treatment with Lamivudine), the clinical

evolution was unfavorable and we decided reevaluating the histological sections (were positive for tuberculosis) and another CT – scan was made. The angiotensin-converting enzyme was in normal limits. The diagnostic was reconsidered, establishing extrapulmonary lymph node tuberculosis. After 6 months of tuberculostatics, the clinical and paraclinical evolution was favorable, with significantly decrease of mediastinal tumor and reducing symptoms. The corticosteroid doses were gradually excluded.

Discussions: The case particularity is represented by disease association (diabet melitus, CKD in HD, chronic hepatitis B and mediastinum tuberculosis of lymph nodes). Differential diagnosis between sarcoidosis and extrapulmonary tubercolusis was very important, because corticosteroids administered for sarcoidosis could decompensate liver function (replication of hepatitis B virus) and glycemic status. The tuberculostatic treatment could decompensate liver and eye function, and doses must be reduced for Clcr <15 ml/min/1,73 m^2. In addition to this, the polylobulate mass in relation with large and vital mediastin vessels compel to closely monitor and relatively reserved prognosis.

Keywords: hemodyalisis, extrapulmonary lymph nodes tuberculosis, chronic hepatitis B, mediastinal tumor

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The effect of oral NaHCO3 treatment on RBC, WBC, HGB and PLT levels of chronic kidney disease patients in the predialysis period

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Aim: The incidence of acidosis increases with the progression of chronic kidney disease (CKD). Correction of acidosis by sodium bicarbonate may slow CKD deterioration. There is evidence that blood cells and hematological parameters are disturbed in CKD. Anemia, thrombocytopenia and changes in leukocyte levels are reported in patients with chronic renal failure. In this study we aimed to investigate the effect of oral NaHCO3 treatment on RBC (red blood cells), WBC (white blood cells), HGB (hemoglobin) and PLT (platelet) levels of chronic kidney disease patients in the predialysis period.

Materials and method: A total of 111 patients with chronic kidney disease were enrolled in this prospective study. All patients were in the predialysis period and not receiving erythropoietin and any other medications that alter blood count. Complete blood count were performed at baseline and after three months of oral sodium bicarbonate. MedCalc 15.4 software program was used for statisitical analysis. Chi square was used to show categorical measures. The Wilcoxon test for paired samples or paired samples t-tests were used for comparison of the measurements.

Results: The mean age was 59.7±15.4 years. There were 51 (45.9%) women and 60 (54.1%) men. The mean glomerular filtration rate and blood pH were 25.3±11.4 mL/min and 7.321±0.053 respectively. The mean RBC, WBC, HGB and PLT levels at baseline were 3.9±0.6, 8.7±2.7, 11.7±1.9, 274.4±94.5 respectively. After three months of NaHCO3 the mean RBC, WBC, HGB and PLT levels were 3.9±0.5, 8.4±2.5, 11.8±1.7, 262.0±90.0 respectively. The differences between the RBC, WBC, HGB at baseline and after three months of NaHCO3 treatment were not statistically significant (p= 0.162, 0.209, 0.162 respectively). PLT level was different between at baseline and after three months (p=0.017). The mean glomerular filtration rate and blood pH after treatment were 24.9±12.2 mL/min and 7.324±0.050 respectively. The differences were not significant (p=0.225, 0.522 respectively).

Conclusion: Although correction of acidosis may slow CKD deterioration and reduce complications, oral NaHCO3 treatment for three months did not have any significant effect on RBC, WBC, HGB levels of chronic renal disease patients in the predialysis period. Low PLT level may be due to the accumulated guanidinosuccinic acid and fenol compounds.

Keywords: chronic kidney disease, NaHCO3, RBC, WBC, HGB, PLT

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Alström syndrome presenting with acute kidney failure

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Introduction: Alström syndrome (AS) is a rare autosomal recessive disorder characterized by multi organ involvement. It is caused by mutations in the ALMS1 gene. AS affects both sexes similarly and has a prevalence of <1:100.000. Characteristic features of the disease are loss of vision and hearing in childhood, childhood truncal obesity, hypertriglyceridemia, insulin resistance, type 2 diabetes, dilated cardiomyopathy and progressive pulmonary, renal and hepatic dysfunction. In this study we presented an Alström syndrome with acute renal failure.

Case report: A 46 years old male with acute kidney failure hospitalized. At initial evaluation, the patient was stable, conscious, orient and cooperative. His vital signs were; blood pressure: 110/70 mmHg, heart rate: 82/minute/ritmic, temperature: 36.7ºC. The patient had nausea and vomiting for the last three days and a gradual decrease in his urine output for the last 24 hours. In his laboratory work up, urea was 140 mg/dL, creatinine was 5.4 mg/dL, serum electrolytes were in normal ranges, plasma glucose level was 140 mg/dL, and no pathological finding on urine examination. In his arterial blood sample, pH was 7.38 and bicarbonate was 28 mEq/L. There was no pathological finding in his urinary system ultrasonography except bilateral grade 1-2 increased renal echogenicity. A Foley catheter was inserted into his bladder and in his follow up, urine output was found to be 15 cc/hour. With clinical and laboratory findings, the patient did not need hemodialysis. Diagnosis of oliguric acute kidney failure was given and conservative treatment was started. His follow up continued in internal medicine clinic. After ten day, urea and creatinine levels returned to normal range with intravenous hydration.

In his medical history, the patient had been taking an oral anti diabetic agent and a fenofibrate for the last year for his type 2 diabetes and hypertriglyceridemia. In review of systems, impotence, erectile dysfunction, hearing loss and a decrease in vision were found. Hypergonadotropic hypogonadism, bilateral sensorineural hearing loss and retinal dystrophy were detected by examination and blood tests. With these findings, the patient was diagnosed with AS and he was recommended for genetic counseling.

Conclusion: Acute renal failure patients with obesity or insulin resistance or type 2 diabetes, heart failure, hearing loss, sexually dysfunctions, hormonal disorders, and vision disorders should be investigated for Alström syndrome. Suspected cases should be tested for ALMS1 mutation and also family history should be checked.

Keywords: Alström syndrome, acute renal failure

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Peritoneal Dialysis in children: the first experience in Kazakhstan

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Summary: Peritoneal Dialysis (PD) remains one of the leading methods of Renal Replacement Therapy (RRT), especially in children. This study analyzed first experience of pediatric PD in Kazakhstan. There were treated 88 children (36 newborns and children in early ages with acute renal failure (ARF) and 52 children with end-stage chronic kidney disease, including one child of 3 months old). All cases of ARF had positive dynamic with following recovery of renal function.

Introduction: The first five month experience of applying Peritoneal Dialysis (PD) in children.

Methods: There have been treated 88 children: 20 newborns with acute renal failure (ARF) after surgery for complex congenital heart disease, 2 children in early age (5 and 6 months of age) with ARF on severe necrotizing pneumonia with pneumothorax, 3-month-old 5 baby with congenital kidney hypoplasia leading to end-stage renal disease (ESRD), 6-12 month-old 15 child with diarrhea positive form of hemolytic uremic syndrome (HUS) and seven 10 and 12-years-old children with ESRD were transferred from hemodialysis (HD) to PD. All children, with the exception of those transferred from HD, had severe general condition and had developed multiple organ failure.

The Tenckhoff catheter for PD was implanted surgically and dialysate solution ("Physioneal" or "Dianeal", Baxter) was placed into abdomen immediately after operation. The patients received PD through manual exchanges of solution, and therapy was usually initiated at low fill volumes of 20-30 mL•kg^{-1} with shorter dwell times up to 1 hour. In cases with severe edema PD was initiated with dextrose concentration 2.27% and dwell time 30 min. Duration of acute PD was from 1 to 15 days. All cases of ARF had positive clinical dynamic with following recovery of renal function.

2 children with ESRD received PD through the use of an automated cycling system ("Home Choice Pro", Baxter). Adequacy of PD was estimated by measurements of weekly Kt/V (Urea clearance) and Ccrea (creatinin clearance) taking into account the residual renal function (RRF). In both cases Kt/V was more than 1.7 with Ccrea of 60 L/1.73 m^2 at least. After 3-month treatment there were significant decrease in erythropoietin requirement and normalization of blood pressure. In one case the improvement of RRF was marked.

There were following complications:

1. One case of peritonitis in child transferred from HD. After intraperitoneal antibiotic therapy there was clinical improvement within 96 hours.
2. One case of pericatheter leak in 3-month-old baby as an early postoperative complication was caused by rapid increase of exchange volume of 30mL•kg^{-1} on the second day after operation.

Conclusions:

1. Peritoneal Dialysis is a method of first choice in renal failure especially in newborns and children of early age.
2. For prevention of pericatheter fluid leak and hernias the therapy should be initiated at reduced exchanged volume of 10-20 mL•kg^{-1} with gradually increasing to 40 mL•kg^{-1}.
3. PD treatment can be started immediately after catheter insertion, especially in severe patients.

Keywords: chronic renal failure, dialysis, peritoneal dialysis

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Pressure interlocking control system prevents catheter suction toward the vessel wall

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Background: Vascular access catheters (henceforth, catheters) are primarily used for vascular access in patients with acute renal failure. However, catheters often dysfunction during blood purification therapy, particularly because precautionary measures fail to prevent suction from the arterial pore of the catheter toward the vessel wall (1). The purpose of the pressure interlocking control system is to prevent hemolysis by adjusting blood flow (Qb).

Purpose: To investigate whether pressure interlocking control system prevents the catheter suction toward the vessel wall.

Methods: We used KM-8700 and blood circuit XT757 in the pressure interlocking control system. Twin End or Niagara Slim were connected to the blood circuit Qb was set at 80 mL/min and 120 mL/min considering continuous renal replacement therapy. An ex vivo pig vein evaluation system (2), which we developed, was used. The catheters were inserted into an extracted pig vein of approximately 10 mm in diameter and 200 mm in length. The pig vein was connected to the blood circuit NK-Y030PL and the vein was filled with 50% glycerol solution and circulated at a flow rate (Qv) of 100-300 mL/min. Arterial pore of the catheter was positioned approximately 1 mm from the wall of the pig vein.

Results: Suction toward the vessel wall occurred 10/10 times in the non-pressure interlocking control system and 8/10 times in the pressure interlocking control system, at Qb and Qv of 80 and 100 mL/min, respectively. No suction occurred in both systems when the Qb and Qv were 80 and 300 mL/min, respectively. However, suction occurred 10/10 times in both systems when the Qb and Qv were 120 and 100 mL/min, respectively. Suction occurred 10/10 times in the non-pressure interlocking control system and 2/10 times in the pressure interlocking control system, at Qb and Qv of 120 and 300 mL/min, respectively.

Conclusion: Pressure interlocking control system may prevent suction from the arterial pore of the catheter toward the vessel wall.

Keywords: vascular access catheters, pressure interlocking control system, suction toward the vessel wall

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