



Second Day

Wednesday, November 23

O301

Therapeutic Apheresis and Nephrologists

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Nephrologists all over the world perform therapeutic plasmapheresis. Plasma exchange is available in all major cities and medical centers. Therapeutic apheresis such as plasma exchange, membrane plasmapheresis, double filtration, chemoadsorption, and immunoabsorption are used to treat a wide range of diseases. Cytopheresis such as thrombocytapheresis is used to treat symptomatic thrombocytosis. Other cytopheresis are lymphocytapheresis to treat leukemia, peripheral stem cell collection of CD34 for bone marrow transplant, granulocyte/macrophage collection to treat inflammatory bowel disease. Erythrocytapheresis is used to treat sickle cell crisis and photopheresis to treat transplant rejection. There are six methods of cholesterol removal in the case of familial Type II-A hypercholesterolemia and patients with coronary heart disease not responding to cholesterol lowering medications. These are as follows: plasma exchange, double filtration, chemoadsorption, HELP system (heparin mediated extracorporeal low-density lipoprotein), immunoabsorption using anti-LDL antibodies, and direct apheresis of lipoprotein from whole blood called DALI.

Beta microglobuline that accumulates in dialysis patients can be removed by immunoabsorption column called Lixelle. Therapeutic apheresis remains the first choice in diseases requiring emergency plasmapheresis such as anti-GBM disease, TTP, myasthenia gravis crisis, hyperviscosity syndrome, and transplant rejection. Double filtration using filter with different pore sizes are used to remove large molecules with different sizes such as LDL and IgM, IgG, and IgA antibodies. Cryofiltration is a procedure to precipitate cryoglobulines or cryofibrinogene in cold and removed by cryofilter. Tandem cryofiltration and HD can be used to treat cryoglobulinemic renal failure.

We have performed more than 1300 cryofiltrations on 49 patients and more than 430 double filtrations to remove IgG and IgM antibodies in 22 patients. Two hundred and fifty LDL pheresis using double

filtration and liposorba system on patients with familial hypercholesterolemia type II-A. We have done peripheral stem cell CD34 collections in last 15 years and photopheresis for 27 years. Therapeutic apheresis is proven safe and effective if used as indicated.

O302

Clinical Presentation and Plasma Cytokine Levels of Hantavirus Infected Patients in Southwest Germany

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Introduction. Hantaviruses of the family Bunyaviridae are emerging zoonotic pathogens which cause hemorrhagic fever with renal syndrome (HFRS) in the old world and Hantavirus Pulmonary Syndrome (HPS) in the new world. An immune-mediated pathogenesis is discussed for both syndromes. The aim of study was comparing clinical and immunological characteristics in a cohort of patients hospitalized with severe acute hantavirus infection with healthy control subjects.

Methods. We retrospectively studied 64 patients hospitalized with acute Pulmonary hantavirus infection, detected by positive anti-hantavirus IgG and IgM, during a hantavirus epidemic in Germany in 2010. Detailed clinical parameters and plasma cytokines were analyzed during the acute phase of disease and in the convalescence period.

Results. Typical clinical presentation included initial febrile illness with mainly fever, lumbalgia, headache, vision disturbance, and gastrointestinal symptoms followed by subsequent renal failure comparable to the clinical spectrum reported in recent epidemics; however, several unusual clinical presentations were observed. Cytokine analysis revealed significantly higher plasma levels of IL-2, IL-6, IL-8, TGF- β 1, and TNF-alpha in hantavirus-infected patients during acute and convalescence phases compared to uninfected controls. From acute to convalescence phase, TGF- β 1 plasma levels increased whereas plasma IL-6, IL-10, and

TNF-alpha significantly decreased.

Conclusions. Activation of T-lymphocytes and monocytes/macrophages supports the hypothesis of a mainly immune-mediated pathogenesis during hantavirus infection. In the convalescence phase, immunosuppressive TGF- β 1 level increase, suggesting the induction of a protective immune mechanism that down-regulates the immune response.

O303

Bladder Dysfunction in Children With Nocturnal Enuresis

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Introduction. Nocturnal enuresis is a common health problem during childhood period. Different etiological factors have been suggested in the pathogenesis. New studies reveal association between enuresis and voiding disorders (bladder dysfunction). This study was conducted to define frequency of urodynamic abnormalities in enuretic children and to determine parameters that might predict bladder dysfunction.

Methods. Sixty neurologically normal children who referred nephrology clinic during a 2-year period enrolled study. Urinalysis, U/C, kidney-bladder US, and uroflowmetry were done for all. Full Urodynamic Study (UDS) including pelvic floor EMG and CMG were done in case of abnormal uroflowmetry, abnormal bladder US, daytime incontinence, and age > 10 years in patients with MNE. Finally, 48 patients underwent UDS.

Results. In 11 cases, results were unreliable. The results were normal in 10 (20.8%) and 27 (56.2%) had abnormal UDS. In 37 patients, the results of UDS were reliable which included Over Active Bladder (OAB) in 23 (62.2%) patients, detrusor over activity in 17 (46%), OAB + detrusor over activity in 15 (40.6%), and under active bladder in 2 (5.4%). There was not any significant differences between age, gender, family history of enuresis, presence of daytime incontinence, and bowel symptoms (constipation or encopresis) regarding to US findings in patients with abnormal and those who had normal UDS.

Conclusions. We found that abnormal UDS is common in enuresis. Overactive bladder is the most

common finding and clinical and US parameters can predict enuretics who need urodynamic evaluation.

O304

CRIB, CRIB II, SNAP, SNAP II and SNAP-PE Scoring Systems and RIFLE Criteria in Critically Ill Neonates With Acute Renal Failure

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Introduction. More than 30 Acute Kidney Injury (AKI) definitions exist in the published literature and there is no consensus especially in neonatal group. Chevalier and colleagues defined neonatal acute renal failure as serum creatinine values > 1.5 mg/dL for at least 24 hours. Acute Renal Failure (ARF) affects approximately 1% to 24% of newborns in the Neonatal Intensive Care Units (NICUs). ARF is a significant factor of morbidity and mortality in critically ill children. The Acute Dialysis Quality Initiative (ADQI) group has recently proposed the RIFLE criteria for AKI in adults. The RIFLE acronym stands for risk, injury, failure, loss of kidney function and end-stage renal disease. This classification system to define AKI in neonatal group has not been performed. We hypothesized that critically ill neonates with ARF based on old definition (serum creatinine more than 1.5 mg/dL) have decreased survival, independent of demographic characteristics, co-morbidities, clinical parameters, severity of illness and interventions variables known to predict infant survival. According to this hypothesis, we evaluated urine output, serum creatinine, and glomerular filtration rate in critically ill neonates and compared them to RIFLE scoring system.

Methods. This cohort study was conducted at the neonatal intensive care units of Mofid and Mahdiah hospitals which are two of the largest referral neonatal hospitals in Tehran. There are about 4400 deliveries annually in the Mahdiah hospital and about 2000 admissions to the both neonatal intensive care units each year. Between March 2006 and May 2009 all neonates transferred to these NICUs were enrolled for the study in a prospective manner. We determined GFR, urine output, mortality, morbidity, and the RIFLE score

for each neonate. We also evaluated CRIB, CRIB II, SNAP, SNAPII and SNAP-PE score for each neonate and the final scores were then obtained by the arithmetic sum of individual scores of these parameters. The predictive accuracy of these receivers were expressed as area under the receiver operative characteristic (ROC) curve for each score and help to compare the performance of different tests, by plotting sensitivity, specificity, PPV and NPV. All groups were statistically analyzed by the t test and logistic model was used to analyze the prediction of mortality. The ethics committee of the Shahid Beheshti medical university and pediatric infectious research center approved this study.

Results. We evaluated 404 neonates of NICUs of Mofid and Mahdih hospitals during 2007 to 2009. Based upon RIFLE scoring system, 22.5% (91 neonates) of our study group had normal renal function and 77.5% (313 neonates) of them had abnormal renal function at the second day of admission. Therefore 313 neonates (77.5%) developed AKI by RIFLE criteria and among them 43% (135 neonates) met the risk, 51% (161 neonates) the injury and about 6% (17 neonates) the failure criterion. Based on old definition of ARF in neonates the rate of ARF in our study group was 3.2% (13 out of 404 neonates had serum creatinine more than 1.5 mg/dL), $P < .001$. In this study, we detected an overall in-hospital mortality of 20.5% in critically ill neonates. Of those who died, 81.9% (68 of 83 patients) had AKI. In patients with normal renal function, the rate of mortality was 16.5% and in patients with AKI based on RIFLE scoring system the mortality rate was 21.7% ($P < .31$). In R (risk) group the mortality rate was 16.3%, in I (injury) group the mortality rate was 24.2% and in F (failure) group the mortality rate was 41.2%. In patients with ARF based on creatinine level definition (serum creatinine more than 1.5 mg/dL) the mortality rate was 61.5% ($P < .001$, OR=6.741). A progressive and significant elevation in mortality was correlated with increasing RIFLE classification severity among all patients. (OR = 1.406, $P = .042$; CI = 0.76 to 2.06). The patients who had any degree of AKI at the time of admission to the NICU as well as those who had normal renal function had statistically significant higher median CRIB, CRIB II, SNAP, SNAP II and SNAP-PE NICU scoring systems, lower levels of apgar score, serum PH, serum bicarbonate and platelet count and were

younger and smaller. Injury group on admission was associated with higher mortality than Risk group on admission ($P < .001$) and patients who developed Failure criteria during NICU stay had higher mortality than those who developed Risk group criteria (OR = 3.17) or Injury group (OR = 1.84).

Conclusions. We concluded that a RIFLE criterion is a practical method to define AKI in neonatal group and it will be a good predictive tool for morbidity and mortality in NICUs.

O401

Long-term Outcome of Renal Transplantation in Patients With Familial Mediterranean Fever Amyloidosis, a Single Center Experience

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Introduction. Familial mediterranean fever (FMF) is an autosomal recessive disorder characterized by recurrent attacks of fever associated with serositis affecting the pleura, peritoneum, and/or large joints as well as systemic amyloidosis of AA type causing nephropathy and end-stage renal failure (ESRD). Renal transplantation (RTX) remains to be a choice of treatment for ESRD. The aim of this study was to investigate long-term results of RTX in patients with FMF amyloidosis.

Methods. We compared results of RTX in 21 patients with FMF amyloidosis among 542 (3.9%) transplants with 51 age and sex match non-FMF renal-transplanted patients as controls. In two groups, immunosuppression and duration of transplantation were similar. All FMF patients have MEFV mutation analysis and renal biopsy before RTX. Blood urea and creatinin, urine analysis, and Cyclosporine level were done monthly and 24 hours proteinuria every 3 months. All FMF patients were received Colchicine 1.5 to 2 g/d. Episodes of acute rejection were recorded. All patients were followed at least 5 years.

Results. In our study, one year's graft and patient survivals were 95% and 100%, respectively. They were 85.71% and 95.23%, 5 years after renal

transplantation (in FMF group without significant differences versus controls group). The results of FMF gene analysis were M694V/M694V homozygote in 9, M694V/EQ148 in 2, M694V/V726A in 3, 680M-I/E148Q in 3, and M694V/M680I in four patients. Recurrence of amyloidosis was documented in two allograft recipients presenting with nephrotic range proteinuria (9.5%), one of whom lost the allograft due to recurrence. 5 years after RTX (one patient had M694V/M694V gene analysis while the other had M694V/M680I). One patient experienced late acute rejection 10 months after RTX. He became complicated with severe sepsis and he lost his kidney due to obligatory reductions in immunosuppression. Another patient lost his kidney due to chronic allograft nephropathy and developing post-transplant lymphoma. He died 56 months after RTX.

Conclusions. The long-term outcomes of transplantation in patients with amyloidosis secondary to FMF is similar to that in the general transplant population and maintenance Colchicine, even at low dose, appears to effectively prevent recurrence of amyloidosis in the allograft.

O402

Comparison of Immediate Renal Dysfunction in Split and Partial Liver Transplantation Versus Full Size Liver Transplantation in Shiraz Transplant Center, Iran

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Introduction. Renal dysfunction (RD) is a common complication in patients undergoing liver transplantation; it predisposes to further complications that are associated with an increase in morbidity and mortality in the immediate post-operation period. However, there is not any effective therapeutic strategy to prevent renal dysfunction. Various factors are outstanding in the pre-operation and post-operation period, as well as during surgery, which could predict the occurrence of renal dysfunction. These include the complexity of operation for liver transplantation, post-operation graft dysfunction, sepsis, and

drug nephrotoxicity. Despite efforts to increase donor organ procurement, the demand for liver allografts has continued to exceed the number of organs available. This fact has resulted in an increase in the application of split and partial liver transplantation (SLT and PLT respectively). The aim of this study is to evaluate renal dysfunction in immediate post-operation period in patients that received split and partial liver transplantation and to compare the findings with corresponding data in patients who received full-size liver graft. **Methods.** Changes in renal function during first 4 weeks after transplantation were analyzed retrospectively in 32 patients that received split and partial liver transplants SPLT group. The findings in this group were compared to corresponding data on 42 matched patients who received full-size liver transplants FSLT. All 72 patients were treated in our center from 1993 to 2006. Patients who had pre-transplanted renal dysfunction were excluded from the study. The severity of the liver disease was classified according to the Child-Turcotte-Pugh grading system (CPT), and the Model for End Stage Liver Disease score (MELD). The basic immunosuppression regimen included corticosteroid and mycophenolate mofetil with cyclosporine or tacrolimus. Serum creatinine (SCr), serum bilirubin, blood urea nitrogen (BUN) and international normalized ratio (INR) were measured before surgery, and, postoperatively, daily during the first week and at days 14, 21, and 28 Postoperative.

Results. Between 1993 till 2006, 32 patients received SLT and LRLT (SPLT group); 10 patients (31.2%) were from deceased donors and 22 patients (68.7%) were from living related donors. During this period 42 matched patients received full-size liver transplants (FSLT). Acute rejection was diagnosed in 16 (51.6%) of SPLT group and in 9 (21.4%) of FSLT group which was significantly more frequent in SPLT group ($P = .007$). Among rejected patients 24% developed RD, postoperatively. The incidence of sepsis was significantly higher in SPLT group (23.3%) than FSLT group (4.8%), $P = .024$ and 33% of these patients developed RD, postoperatively. **Conclusions.** RD in the postoperative period after liver transplantation is common; it predisposes to further complications that are associated with a high mortality as well as development of chronic renal failure. The etiology of post liver

transplant renal failure is multifactorial including ischemic acute tubular necrosis, pre-renal state, use of potentially nephrotoxic drugs and sepsis-associated renal dysfunction. In our study despite higher incidence of RD in split and living related liver transplant (25.8% of patients) than full-size liver transplant (9.5% of patients), this difference is not statistically significant ($P = 0.063$). Higher incidence of rejection, reoperation, complication and a longer duration of surgery, anhepatic phase and mechanical ventilation in SLT patients may be related to difference in sepsis, renal function and requirement for renal replacement therapy found in this study.

O403

The Predisposing Factors of Acute Renal Failure in Scorpion Stung Children

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Introduction. Scorpion sting is one of the most important health problems in Iran and most subtropical countries. In Khuzestan province, according to scorpion types and long lasting hot season, the scorpion sting is a serious problem especially in children. Scorpion sting has local and systemic clinical manifestations. The most important systemic manifestation is Acute Renal Failure (ARF). This study was performed to investigate the predisposing factors of ARF in scorpion-stung patient.

Methods. This retrospective study performed on scorpion-stung patients admitted in Abuzar pediatric hospital, Ahvaz, from 2005 to 2010. The patients divided to two (ARF and non-ARF) groups and we statistically compared the risk factors of ARF in both groups.

Results. Out of 629 patients in study, 57.1% were male and mean age was 6.29 years. Summer was the most frequent season. Most of stung patients presented in the summer, hemiscorpius leptorus was the most frequent scorpion, and foot was the most common stung site. Young age, hyperthermia, hypertension, hemoglobinuria, proteinuria, pyuria, anemia, leukocytosis, thrombocytopenia, and stung patients with hemiscorpius leptorus scorpion were significantly associated with ARF ($P < .001$, in

all). In ARF group, the mean age was 4 years and frequency of anemia was 56%, thrombocytopenia 31%, pyuria 36.4%, hematuria 31.8%, proteinuria 71.1%, and hemoglobinuria 62.6%.

Conclusions. According to our findings, the toxic effects of hemoglobin, toxic acute interstitial nephritis, and hemolytic uremic syndrome were the pathogenesis of ARF in our scorpion-stung patients.

O404

Efficacy of Vitamins C, E and Their Combination for Treatment of Restless Legs Syndrome in Hemodialysis Patients; a Randomized, Double-Blind, Placebo-Controlled Trial

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Introduction. Restless legs syndrome (RLS) is a common disorder in hemodialysis patients that leads to insomnia and impaired quality of life. Because high oxidative stress has been implicated in the pathogenesis of RLS, we sought to evaluate the efficacy of vitamins C and E and their combination in reducing the severity of RLS symptoms in hemodialysis patients in this randomized, double blind, placebo-controlled, four-arm parallel trial.

Methods. Sixty patients on stable hemodialysis who had all four diagnostic criteria for RLS developed by International Restless Legs Syndrome Group with no acute illness or history of renal stone were randomly allocated to 4 equal groups. They receive vitamin C (200 mg) and vitamin E (400 mg), vitamin C (200mg) and placebo, vitamin E (400mg) and placebo, and double placebo daily for 8 weeks. The primary outcome was absolute change in international restless legs scale (IRLS) sum score from baseline to the end of treatment phase. IRLS scores and laboratory parameters such as serum levels of iron, ferritin, calcium, phosphorus, parathyroid hormone, and hemoglobin were measured for all patients at baseline and at the end of treatment phase.

Results. Means of IRLS sum score decreased significantly in vitamins C and E (10.33 ± 5.33 ;

95% CI, 7.38 to 13.28), vitamin C and placebo (10.00 ± 3.46 ; 95% CI, 8.08 to 11.92), and vitamin E and placebo groups (10.13 ± 5.99 ; 95% CI, 6.82 to 13.45) compared with the double placebo group (3.13 ± 2.97 ; 95% CI, 1.49 to 4.78). No differences were observed between these treatment groups. Changes in laboratory parameters had no effect on the observed reductions in the severity of RLS in 4 groups.

Conclusions. Vitamins C and E and their combination are safe and effective treatments for reducing the severity of RLS in hemodialysis patients in short-term.

O405

Auditory Disorders in Children With End-Stage Renal Disease

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Introduction. Abnormalities in auditory system are frequent in patients with End-Stage Renal Disease (ESRD). There is not any consensus for the effect of renal failure and hemodialysis on auditory complications. The aim of this study was to evaluate the auditory abnormalities in pediatric ESRD patients undergoing long-term hemodialysis and compare the results with those of nondialytic Chronic Renal Failure (CRF) children and controls.

Methods. Children aged 1 to 16 years were evaluated in three groups: 25 ESRD patients undergoing

hemodialysis, 25 nondialytic patients with CRF, and 25 age- and sex-matched normal counterparts. Patients with history of otological disease, ear trauma, diabetes mellitus, receiving ototoxic drugs and syndromes with hearing abnormalities were excluded. The Auditory Brain stem Response (ABR) and Otoacoustic Emission (OAE) were tested in all subjects. Frequency of cases with abnormal findings was compared between the groups.

Results. Seventy two percent of patients were male. The mean age of patients was 9.9 ± 3.2 years. The mean duration of dialysis was 22.2 ± 12.2 months. The ABR testing in dialytic patients showed abnormal results in 11 (44%) patients as bilateral symmetric increased V latency by 35 decibels amplitude in frequencies between 1000 and 4000. The ABR testing was normal in nondialytic CRF children and controls ($P < .001$). The OAE testing was abnormal in all dialytic patients with abnormal ABR testing results (44%) in 1 (4%) nondialytic CRF children and in no controls ($P < .001$). There was no significant difference with regard to age, gender, height, weight, blood pressure, serum levels of blood urea nitrogen, creatinine, sodium and potassium, glomerular filtration rate, duration of dialysis, and dialysis adequacy between dialytic patients with and without abnormal results of ABR/OAE testing.

Conclusions. Sensorineural hearing loss is rare among nondialytic pediatric patients with CRF but very common in ESRD children undergoing long term hemodialysis.