MIS (MALNUTRITION-INFLAMMATION SCORE) IS EFFECTIVE AND CRUCIAL TOOL FOR PROGNOSTIC PREDICTION OF PERITONEAL DIALYSIS PATIENT

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Introduction and Aims: Malnutrition occurs in peritoneal dialysis (PD) patients commonly and may correlate with increased mortality. Several factors, such as protein loss into the peritoneal cavity, chronic inflammation, accumulation of uremic toxins, etc. could influence PD patients' nutritional status. Nutritional assessment of PD patients is a very important process to evaluate their nutritional condition. MIS is a useful tool to assess patients' nutritional status comprehensively. In this study, we validated the efficacy of MIS as a prognostic factor of PD patients. Methods: 40 patients (male 11, female 29) were enrolled into the study. A mean age of the onset of PD was 78.5 ± 7.4 years. All patients had their nutritional status assessed with MIS and were classified into three subgroups corresponding to each MIS score, normal nutritional group (MIS 0-7), mildly impaired group (MIS 8-12), severely impaired group (MIS over 13) respectively. We analyzed patients' survival rates and compared it among three groups using the Kaplan-Meier analysis. Results: Three year survival rates of the normal group, the mildly impaired group and severely impaired group were 72.9, 71.0% and 35.2% respectively. And we found a significant difference in the mortality between the severely impaired group and the other two groups with a Log-Rank test (P = 0.0312). Conclusions: The results of this study indicated that MIS is one of the prognostic factors for PD patients. MIS is a comprehensive and quantitative nutritional assessment and consists of several components (medical history, physical examination, body mass index and laboratory parameters). According to the scores of each component, we can design therapeutic intervention for patients with malnutrition. MIS is powerful predictor for PD patients.

THE EFFECT OF OMEGA-3 FATTY ACID SUPPLEMENTATION ON OXIDATIVE STRESS IN CONTINUOUS AMBULATORY PERITONEAL DIALYSIS PATIENTS

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Introduction and Aims: End stage renal disease (ESRD) is a condition that inflammation and oxidative stress plays an important role in damaging to tissues, especially in vascular system. The effect of omega-3 fatty acids is documented in some inflammatory diseases via eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) components of fish oil. The aim of this study was to investigate the effects of dietary omega-3 fatty acid supplementation on levels of lipid peroxidation and oxidative stress in ESRD patients. Methods: This randomized controlled double-blind clinical trial consisted of 90 patients on CAPD. One group was treated orally with 3000 mg omega-3 per day for 8 weeks (n=45) and the other matched group by placebo (n=45). Serum levels of lipids, iron, ferritin, PT, PTT, superoxide dismutase and reduced glutathione were measured at the beginning and at 8 weeks. Results: Our results showed that superoxide dismutase and reduced glutathione were not significantly changed in omega-3 group where lipid profile was showed no significant changes too. Erythropoietin requirements also had no significant changes too. Conclusion: Our results indicate that SAHA can suppress peritoneal thickening and fibrosis in mice. These results suggest that SAHA may have therapeutic potential for peritoneal fibrosis.

SUBEROYLANILIDE HYDROXAMIC ACID ATTENUATES PERITONEAL FIBROSIS INDUCED BY CHLORHEXIDINE GLUCONATE IN MICE

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Introduction and Aims: Long-term peritoneal dialysis causes peritoneal fibrosis in submesothelial areas. However, the mechanism of peritoneal fibrosis is unclear. Epigenetics is defined as a heritable change that occurs outside the modification of DNA coding sequence. Among epigenetic modifications, histone acetylation leads to the transcriptional activation of genes. Recent studies indicate that histone acetylation involves the progression of fibrosis. Therefore, we examined the effect of suberoylanilide hydroxamic acid (SAHA), one of HDAC inhibitors, on the progression of peritoneal fibrosis in mice. Methods: 10 week-old male ICR mice were divided into three groups, chlorhexidine gluconate (CG), CG + SAHA, and control group. Peritoneal fibrosis was induced by the injection of CG into peritoneal cavity in mice every other day for 3 weeks. SAHA or vehicle was administered subcutaneously every day from the start of CG injection for 3 weeks. The mice were sacrificed 3 weeks after the first CG injection and peritoneal tissues were taken. Histological changes were evaluated. Results: Our results indicated that SAHA can suppress peritoneal thickening and fibrosis in mice. These results suggest that SAHA may have therapeutic potential for peritoneal fibrosis.

PERITONEAL DIALYSIS - A

FACILITATIVE EFFECTS OF TRANSPLANTED ADIPOSE-DERIVED MESENCHYMAL STEM CELLS DURING REPAIR IN CHLORHEXIDINE-INDUCED PERITONEAL FIBROSIS RATS

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Introduction and Aims: Transplantation of adipose-derived mesenchymal stem cell (ADSC) has been suggested to repair the injured organs and tissues in variety of the fields. Although the rat peritoneal mesothelial cells (RPMCs) improve the peritoneal fibrosis, it is still unclear the effect of ADSC to the peritoneal fibrosis. We established ADSCs and then examined the effect of transplanted ADSCs during peritoneal repair compared with that of cultured RPMCs using cell line previously established in chlorhexidine (CH)-induced peritoneal fibrosis rats. Methods: To prepare the peritoneal fibrosis rat model, continuous-infusion pumps containing 8% CH gluconate in ethanol dissolved in saline were placed in the lower abdominal cavity in 45 male Sprague-Daley rats for 3 weeks. After removal of the pumps, RPMCs and ADSCs were injected into the peritoneal cavity at day 22 or 29. At day 35, morphological alterations and expressions of the tissue regeneration-related factors were examined. Results: Transplantation of ADSCs both at day 22 and 29 facilitated the peritoneal repair. RPMCs injected at day 29 accelerated peritoneal repair, however RPMCs injected at day 22 significantly suppressed the repair. The effect of ADSCs injection to repair was depended on the number of transplanted ADSCs. Expression of VEGF mRNA in the ADSCs injection rats was significantly elevated compared with that in the control rats. The levels of TGF-β and MMP-2 mRNA were inhibited by the ADSC injection. Those levels were significantly increased in the RPMCs injection rats at day 22. Conclusions: It appears that ADSCs transplantation is a useful and new approach for repair of the peritoneal fibrosis contributing to the paracrine effects.

UPDATE ON THE EUROPEAN ENCAPSULATING PERITONEAL SCLEROSIS (EPS) REGISTRY

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Introduction and Aims: Encapsulating Peritoneal Sclerosis (EPS) is a rare but serious complication of long-term peritoneal dialysis (PD). Its aetiology is still
unclear, but important risk factors include duration of PD and stopping PD (transfer to haemodialysis or transplantation). The overall incidence of EPS in Europe is uncertain and there is a lack of consensus on diagnostic criteria for EPS at an early stage. Because of the limited number of EPs patients in individual centres, a central registry is pivotal to record EPS cases thereby facilitating studies in this field. The European EPS Registry has been set up as a web-based database for EPS cases in Europe with the goal to achieve a greater understanding of this condition with regard to its epidemiology, pathophysiology, potential therapeutic interventions.

Methods: The Registry database was built in 2009 collaboratively by nephrologists and hosted by the Hans Ma Institute for independent Quality Research in Nephrology. The diagnosis of EPS was defined by existing ISPD criteria, but also linked to a probability ranking to allow review of likelihood by expert physicians. The online database captures demographic data, CKD, RRT history, details of PD, membrane transport and adequacy, peritonitis history, treatment and outcomes from EPS itself. In 2011 the possibility of electronic submission of suspected EPS cases was launched in Europe at www.epsregistry.eu.

Results: The online database currently consists of 159 patients (63.5% male, median age 53.0 (38.25-63.0 years). Median PD duration was 65 (47-89.75) months. In 124 (78.9%) patients, a CT scan was performed for diagnostic purposes. The contribution per country included: Netherlands (61), Germany (53), Belgium (11), Spain (14), United Kingdom (9), Italy (6), Greece (2), Iceland (1), Hungary (1), France (1). Within the submitted cases in the Netherlands, 48 have been reviewed and 13 patients were classified as EPS. In clinical EPS, 19 with clinical EPS, 10 with suspected early EPS, and 6 patients with No EPS. Overall mortality of patients included was 37.1% with a mean time to death of 9.9 ± 14.9 months after EPS diagnosis.52 (32.7%) patients underwent surgery (enterolysis or peritoneectomy) for EPS.

Conclusions: EPS is an important complication of PD therapy and collaborative approaches across Europe are essential to improve both clinical knowledge around diagnosis and investigations as well as research into causes and treatment. The European EPS Registry has recently been established as an online database. The international submission of EPS cases is successful and we encourage physicians to submit every suspected or proven case of EPS.

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**SP441**

**COMPETITIVE RISKS OF ENCAPSULATING PERITONEAL SCLEROSIS AND DEATH IN PERITONEAL DIALYSIS**

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Introduction and Aims: Encapsulating peritoneal sclerosis (EPS) is an uncommon complication of peritoneal dialysis (PD), where the risk increases significantly with increasing time on therapy. We hypothesise that at the start of PD, risk factors for death would decrease the risk of developing EPS as death will act as a competing risk for EPS.

Methods: We combined 3 large datasets (AnzData, Global Fluid Study, Scottish Renal Registry) with complete data on EPS occurrence and the denominator population. All incident patients aged ≥15 years were included and a competing risks survival analysis used with outcomes of censored, EPS (prior to death) or death and robust standard errors. Comorbidity data was classified by either primary renal diagnosis (low comorbidity = glomerulonephritis, polycystic kidney disease, chronic pyelonephritis, high comorbidity = other) and diabetic status (all 3 datasets) or by Stoke comorbidity score (AnzData and Global).

Results: There were 112 cases of EPS out of 17,912 patients. The cumulative incidence at 10 years varied from 0.04 in AnzData, to 0.25 in the Scottish Registry. The survival analysis results are shown in table 1. Cox models failed to show the ‘protective’ effect of older age and higher comorbidity.

Conclusions: For patients commencing PD, factors that increase the risk of death decrease the risk of developing EPS. Competing risks regression is an appropriate model for analysis of dialysis outcomes.

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**SP442**

**BUDGET IMPACT ANALYSIS OF PERITONEAL DIALYSIS VS. CONVENTIONAL IN-CENTER HEMODIALYSIS IN THE UNITED KINGDOM**

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Introduction and Aims: The increasing prevalence of patients with end-stage renal disease (ESRD) is driving up the costs of dialysis care dramatically. The National Institute of Clinical Excellence (NICE) has projected significant cost savings by increasing the proportion of patients on peritoneal dialysis (PD). This study investigates the five-year budget impact on UK national healthcare spending on dialysis of changing the distribution of adult patients undergoing peritoneal dialysis and in-center hemodialysis (ICHD).

Methods: An Excel-based budget impact model was constructed to assess dialysis-associated costs when changing adult patients between PD and ICHD. The model incorporates the current modality distribution and accounts for UK dialysis payments, drug costs (including ESA), and the costs and probabilities of adverse events including access failure, access infection, pneumonia, and cardiovascular events. Data from the UK renal registry reports were used to estimate the UK adult dialysis patient population for the next five years. The baseline scenario assumed a stable distribution of PD (15%) and ICHD (82%) over five years; the remaining 3% is assumed to practice home hemodialysis. Alternative scenarios included: 1) the prevalence of PD increased by 1.5% each year for five years; 2) the prevalence of PD increased by 3.0% each year for five years; 3) the prevalence of PD decreased by 1.5% each year for five years. All three scenarios were accompanied by commensurate changes in ICHD. In addition, changes in substitutionality distribution for PD and ICHD were assumed in all three scenarios. Differences among scenarios were evaluated in terms of costs to UK National Health Services (NHS).

Results: Under the current UK national tariff, an increase in the prevalent PD population from 15% in 2013 to 21% or 27% in 2017 is predicted to result in five-year cumulative savings for NHS of £18.5 million and £63.6 million, respectively. If the prevalent PD population were to decrease from 15% in 2013 to 9.0% by 2017, the total savings for adult dialysis patients would increase by £71.5 million over the next five years (Table 1). Table 1. Cumulative costs by resource type (value in £1,000s).

Conclusions: Under the current UK national tariff, incentives to increase the proportion of patients on PD could help reduce dialysis-associated costs. The main driver of the savings comes from the reduction of the estimated transportation costs.

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**SP444**

**LONG-TERM EFFECT OF LOW GLUCOSE DEGRADATION PRODUCT DIALLYL SULFIDE SOLUTION ON THE MARKERS OF ENDOTHELIAL DYSFUNCTION AND PHENOTYPE OF HUMAN PERITONEAL MESOTHELIAL CELLS IN CONTINUOUS AMBULATORY PERITONEAL DIALYSIS PATIENTS**

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Introduction and Aims: During continuous ambulatory peritoneal dialysis (CAPD), the peritoneum is exposed to bioavailable dialysis fluids that cause denudation of mesothelial cells and tissue fibrosis. Recent studies showed that vascular events are preceded by endothelial dysfunction and increase in circulating markers of endothelial activation, including vascular cellular adhesion molecule (VCAM)-1 and intercellular adhesion molecule (ICAM)-1. Therefore, the authors conducted a prospective observational study to investigate the effect of the low glucose degradation product (GDP) solution on the markers of endothelial dysfunction and phenotype of human peritoneal mesothelial cells (HPMCs) in CAPD patients.

Methods: Among new CAPD patients from May 2001 to April 2012 in our hospital, 74 patients (43 male, 27 diabetes, mean age 47±11 years) finished a 60-month protocol. They were assigned to one of the four groups, group D (Dianeal®, n=38, lactate-based high GDP solution), group P (Physioneal®, n=17, bicarbonate/lactate-based low GDP solution), group S (StaySafe®, n=10, lactate-based high GDP solution), and group B (Balance®, n=19, lactate-based low GDP solution). Blood chemistry including CRP, ICAM-1 and VCAM-1 were measured at months 1, 12, 24, 36, and 60. HPMCs were
Conclusions: There were no differences in the parameters at the baseline between the four groups. There were significant increases over time in Serum ICAM-1, VCAM-1 level and HPMCs cell score were higher trend in high GDP solution group (group D and group G) than in low GDP solution group (group P and group B). But, it did not reach the statistical significance (p=0.959, p=0.119, p=0.365, and p=0.245, respectively, by RMA). According to the subgroup analysis, serum VCAM-1 levels in HPMCs cell score were significantly higher in lactate-based high GDP solution group (group S) than in lactate-based low GDP solution group (group B) (p=0.029 and p=0.001, respectively, by RMA).

Results: Compared to lactate-based high GDP solution group (group S), lactate-based low GDP solution group (group B) showed the beneficial effect on endothelial dysfunction in CAPD patients in this five year period study. Lactate-based high GDP solution group (group S) also showed higher epithelial to mesenchymal transition (EMT) than lactate-based low GDP solution group (group B) in CAPD patients.

Introduction and Aims: In September 2010 an increased number of sterile peritonitis cases were reported in Europe. Two lots of Nutrenal and One Dialan lot were recalled due to concerns of high infection levels. This study was designed to differentiate clinical characteristics and outcomes in PD patients with endotoxin-associated sterile peritonitis (eSP), bacterial peritonitis (BP) or no peritonitis (NoP) over 12 months.

Methods: An observational, retrospective, medical record review study was conducted in 12 dialysis centers in Hungary, The Netherlands, Portugal, Germany, and the United Kingdom. 46 eSP subjects had sterile peritonitis and 38 NoP subjects were asymptomatic after exposure to a recalled lot, while 43 BP subjects had bacterial peritonitis. Clinical characteristics were analysed at baseline, index event and 12 months post index event. Statistical analyses were descriptive due to small sample size.

Results: At baseline subject demographics, PD prescription, adequacy and residual renal volume were similar across cohorts but the peritonitis rate was 22% in the e-SP compared to 7% and 0% in the BP and NoP cohorts respectively. Diabetes was similar across cohorts. Congestive heart failure was more frequent in the NoP and BP cohorts while ischaemic heart disease was more frequent in the BP and eSP cohorts. 12 months post index event, D/P Cr decreased in the eSP, increased in the BP, and was unchanged in the NoP cohort compared to baseline. Mixed model results showed no statistically significant changes in D/P Cr across cohorts. These were due to lack of PET data in 80% of subjects at 12 months. Peritonitis rate post index event was 17%, 51% and 13% in the eSP, BP and NoP cohorts respectively. Fungal and antibiotic resistant peritonitis occurred only in the BP cohort. 73% of subjects stayed on PD, 9%, 12% and 13% of eSP, BP and NoP subjects respectively transferred to HD. 7%, 12% and 3% of eSP, BP and NoP subjects died respectively. At index event, BP subjects were more likely to be symptomatic, have higher peritoneal WBC and serum CRP, and lower serum albumin compared to eSP subjects. BP subjects required 2.7 additional days in hospital than eSP subjects.

Conclusions: Endotoxin exposure, although not desired, did not have an apparent effect at 12 months on peritoneal membrane function or clinical outcomes. Bacterial peritonitis did appear to alter peritoneal membrane function and clinical outcomes, particularly rates of peritonitis and transfer to HD.

Introduction and Aims: Bacterial peritonitis is a major complication of PD and a leading cause of technique failure. Recognition of bacterial pathogens by the peritoniostatus is mediated in part by toll-like receptors (TLRs). Heme oxygenase-1 (HO-1) gene expression by LPS in macrophages is not only induced via a TLR-4-dependent mechanism, but also increased HO-1 activity has also been shown to have inhibitory effects on intracellular signaling, that is initiated by TLR-4 activation. This regulatory interplay between TLR-4 and HO-1 appears to form a negative feedback loop which might inhibit excessive activation of macrophage by LPS. However, the regulatory effects of HO-1 overexpression on LPS-induced inflammation, which plays a leading cause of technique failure, are unknown in HPMCs, yet. So, the objectives of the study are to examine the effects of overexpression of human HO-1 on LPS-induced inflammation in HPMCs.

Methods: HPMCs in overnight peritoneal effluent were completely isolated with centrifugation. We treated HPMCs with LPS (1μg/ml) and HO-1 inducer (hemin 5μM). To further investigate the pure effect of HO-1 on LPS-induced inflammation, Gene transfer of recombinant Adenovirus–harbouring human HO-1 (Adv-HO-1 Gene) to HPMCs was done. The involvement of MAP kinase family (ERK and JNK) and nuclear factor (NF)-κB in these processes was also studied.

Results: HPMCs constitutively expressed TLR4 and HO-1. LPS increased the expression of TLR4 and HO-1. A prominent induction of IL-8 was detected after LPS stimulation. Treatment of HPMCs with HO-1 inducer, hemin showed a amelioration of LPS-induced changes in expression of TLR4 and IL-8 with increase of expression of HO-1. Human HO-1 gene transfection resulted in a significant increase in HO-1 expression and ameliorated LPS-induced changes. NF-κB expression was also decreased but ERK and JNK were not detected in our study like other previous reports.

Conclusions: Our study suggest that HO-1 pathway is involved in LPS-induced TLR4 responsiveness and HO-1 may regulate LPS-induced inflammation in HPMCs. This study has implications for improving treatment of infection in PD patients and is the first to show the beneficial effect of HO-1 on attenuating LPS-induced inflammation in HPMCs.
patients were collected during the first day of an acute episode of peritonitis and on days 3, 7 and 30 (i.e. at least one week after antibiotic therapy withdrawal). All samples were examined for cell count, bedside culture and calprotectin concentration. In presence of fever or minimal pain, a PD fluid was measured than 100/ mm³ with or without a positive culture was used for diagnosis of peritonitis. Moreover we evaluated C reactive protein and blood leukocytes on the same days of PD effluent collection. Calprotectin levels were determined by means of a modified ELISA test with a threshold value of 156 ng/mL. Continuous glucose non ultrafiltration in PET of 184 ± 162 mL and in miniPET of 370 ± 109 mL. The sodium dip in miniPET was 0.078 ± 0.030, and free water fraction was 0.59 ± 0.22. The mean value of estimated LpS was 0.54 ± 0.026 mL/min/ mmHg and PFA was 1.1 ± 0.9 mL/min. The fractional contributions of different types of pores to hydraulic permeability were: alphaL = 0.038 ± 0.042, alphaS = 0.836 ± 0.095, and alphaL = 0.124 ± 0.081, that resulted in the reflection coefficient for glucose of 0.06 0.014 and OCG = 0.0029 ± 0.0010 mL/min/mmHg. The values of Ps were as follows: 17.3 ± 5.0 mL/min for urea, 8.7 ± 3.5 mL/min for creatinine, 8.2 ± 2.5 mL/min for glucose, 5.1 ± 9.2 mL/min for sodium, and 10.4 ± 4.3 mL/min for phosphate. The initial values of LpS, OCG, and Ps should be considered 1.67 times higher than the basic values.

Results: We investigated 48 patients (28 men, 61±18 yrs) of whom 24.3% were diabetic and 86.7% had hypertension. Mean PD vintage was 30.16 months. During the follow-up, peritonitis was diagnosed in 11 patients (8 men, 59±16 yrs). The PD effluent culture was positive in 9 patients. The mean calprotectin concentration was 263.7±81.4 on day 0 and 35.76±6.8 in day 3. Calprotectin was undetectable in PD samples in 6 patients on day 3 and in 9 patients on day 7, and in all patients on day 30. Notably the only 2 patients with persistence of calprotectin on day 7 were those who presented with a worse clinical course, a long in-hospital stay and who underwent peritonitis recurrence after treatment suspension. In all patients, both PD white cells count and calprotectin levels decreased significantly after the start of treatment (p<0.001). At the time of peritonitis onset, calprotectin concentration correlated well with both the neutrophil count in the PD effluent (r=0.088) and in the circulation (p=0.062).

Conclusions: Calprotectin was detected in PD fluids of all patients at the peritonitis onset and then slowly disappeared within 7 days. Persistence of calprotectin on day 7 or its reappearance after a previous disappearance should be regarded as a risk factor for a worse clinical course.

**SP450**

**A 12 POINT INTEGRATED CLINICAL AND SOCIAL INDEX TO PREDICT PERFORMANCE ON CAPD-2 YEARS FOLLOW UP**

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**Introduction and Aims:** Not much data is available about the impact of psycho-social factors like mental health, financial status, distance from the Unit, and education, on the long term performance of patients in peritoneal dialysis. We developed a 12 point scoring system that incorporated 6 clinical and 6 psycho-social parameters, and assigned scores based on different levels of these parameters. Scoring system for CAPD Diabetes Mellitus No-0, Yes-1 Urine Output <400mL-0, 400-1000mL-1, >1000mL-2 Serum Albumin ≥4.5-0, 3.5-4.0-1, 3.0-3.5-2, Hemoglobin ≥11.0-0, 10.0-11.0-1, 9.0-10.0-2 Ag≥65yrs-0, <65yrs-1 Dialysis/Phosphorus Product ≤0.40-0, >0.40-1 Support Structure for Dialysis Living with family/partner-0, Caretaker/Nurse-1, Alone-2 Education/College-more than School/graduate-Low Illiterate-2 Access to mother unit Easy(<100 miles)-0, Difficult (>100 miles)-1 Finances Fully reimbursed-0,Partly reimbursed-1 Self paying-2 Mental Health No/minimal depression-0, Mild Depression-1, Moderate/severe Depression-2 Mobility No restriction-0, Minor restriction-1, Moderate/severe restriction-2 Methods: All patients initiated on CAPD from Jan 2009 through June 2012 were included in the study and scores were computed. These patients were prospectively followed up 2 years and data on number of hospitalisations, episodes of peritonitis and exit site infections, technique failure and death were recorded. The scoring system was prospectively validated by separating the patients randomly into a validation cohort and a derivation cohort. Subsequently we also retrospectively applied this scoring tool to patients initiated on CAPD from Jan 2005 through Jan 2009. Results: 119 patients were included in the prospective phase of the study and underwent scoring at initiation of CAPD. A score of 14 or more had significant correlation with mortality (p<0.05), episodes of peritonitis (r=0.64,p=0.01) and technique failure (r=0.70,p<0.05). There was no association with Exit Site Infections (p=0.42). Patients were then randomly separated into a derivation cohort and a validation cohort and compared. In the retrospective arm of the study,179 patients were assessed. A score of 14 was significantly associated with hospitalizations(r=0.72,p=0.05)peritonitis (r=0.70,p<0.05)technique failure (r=0.73,p<0.05) and mortality (r=0.73,p<0.05). Upon separating into a derived and a validation cohort there were no significant differences between the patients in either cohort. AUROC curves for predicting hospitalizations was 0.699 (95% CI 0.727-0.859),peritonitis was 0.881 (95% CI 0.758-0.988),AUROC for technique failure was 0.602 (95% CI 0.538-0.757) mortality was 0.815 (95% CI 0.769-0.889).The predictive power remained robust even after a 2 year follow up.

Conclusions: The scoring tool, prospectively and retrospectively, performed well in predicting more hospitalisations and episodes of peritonitis, technique failure and mortality. When retrospectively applied remained good. A score of 14 or more correlated well with adverse outcomes on CAPD.
Abstracts

Nephrology Dialysis Transplantation

was conducted to compare the clinical differences and the impact between patients with initial loss of and fast decline in RRF on long-term prognosis of CAPD patients. Methods: According to the timing of anuria (<100 ml/day) after the CAPD initiation, a total of 274 incident patients were divided into 4 groups: Group 1: anuria detected during the 1st peritoneal equilibrium test (n=41). The other 233 patients were stratified into 3 groups according to the RRF decline rate: group 2: slow decliners (n=78), group 3: intermediate decliners (n=78), and group 4: fast decliners (n=77). The maximum observation period was 120 months.

Results: No difference was noted in long-term prognosis between groups of 1 and 4 (p=0.60) but they had poor long-term prognosis compared to the other two groups (groups 2 and 3) (all p<0.05). By multiple logistic regression tests, group 1 was associated with a 53% increased risk of HD for more than 3 months (OR: 1.57, 95% CI: 1.33-1.86), higher levels of nPCR at initiation (OR: 0.24, 95% CI: 0.14-0.41), while group 4 was significantly associated with congestive heart failure (OR: 4.12, 95% CI: 1.70-10.00), male gender (OR: 1.81, 95% CI:1.71-5.93), and higher BMI (OR: 1.17, 95% CI: 1.07-1.27). By Cox proportional analysis, group 1 (HR: 2.51), group 4 (HR: 2.10), age (HR: 1.04), and diabetes (HR: 2.39) were independent risk factors for long-term mortality.

Conclusions: Although having the higher baseline RRF at the beginning of CAPD, fast decliners showed no initial anuria in the long-term mortality. Independent to age and diabetes, both fast decliners in RRF and initial anuria are two important factors associated to the poor long-term outcomes in CAPD patients.

Introduction and Aims: Tunnel and exit site infections (TESI) portend a potential risk of peritonitis and frequently demand peritoneal catheter removal, having a significantly contribution to Peritoneal Dialysis (PD) technique failure. Establishing risk profiles for TESI may have an important role in their prevention.

Methods: We developed a retrospective cohort study of all patients treated with PD in a single unit between 1990 and 2012. Main demographic, clinical and PD-related variables were compared between patients who suffered at least one episode of TESI and those remaining free from this complication. We applied univariate analysis, including survival between catheter insertion and first episode of TESI (Kaplan-Meier), and produced adjusted risk profiles for this complication using multivariate survival models (Cox).

Results: The study population included 665 patients with mean age of 59 years, 58% male, 34% diabetics, mean Charlson’s score 3.8 and 32% of patients in automated PD.

Conclusions: We also observed a strong association between the risk of TESI and peritoneal Staphylococcus aureus (SAu) and gram negative bacteria, 47% and 34% of TESI respectively. On univariate analysis, SAu carriage, despite screening and treatment with antibiotics, was significantly associated with increased morbidity and mortality in this population. We aimed to investigate the association between HRQoL decrement, other factors and mortality in PD patients.

Methods: One hundred and seventy one PD patients were included and followed for 7 years in this prospective study. Results: Of 171 PD patients, 65 (26.3%) deceased, 18 (10.5%) maintained on PD, 87 (50.9%) shifted to hemodialysis (HD), and 21 (12.3%) underwent renal transplantation (RT). The most common cause of death was cardiovascular disease (CVD) (7.1%), followed by infection (6, 3.3%), cerebrovascular accident (CVA) (5, 11.2%). The etiology of patients who shifted to HD was PD failure (41, 47.1%), peritonitis (33, 37.9%), leakage (6, 6.9%), catheter dysfunction (3, 3.4%), self willingness (4, 4.6%). There was statistically significant difference between surviving and non-surviving patients in terms of gender, body mass index, hemoglobin, serum creatinine, calcium, phosphorus, cholesterol, triglyceride, parathormone levels, Kt/V, PD duration, education and employment status (p<0.05 for all). However, non-survivers were older than survivors (56.6±15.0 vs 43.6±14.6, p=0.003). There were statistically significant difference between two groups in terms of serum albumin, residual urine, presence of diabetes and co-morbidity (p=0.002, p=0.0047, p=0.001, p=0.001, respectively). When the groups were compared regarding health related quality of life (HRQoL) scores, non-survivors had lower physical functioning (59.3±26.1 vs 81.7±21.4, p<0.001), role-physical (21.7±35.6 vs 43.1±42.7, p<0.005), general health (30.6±15.9 vs 38.8±18.9, p=0.004), role-emotional (17.3±35.5 vs 44.4±45.7, p=0.011), physical component scale (PCS) (46.4±20.2 vs 62±15.9, p=0.004), mental component scale (MCS) (35.5±17.7 vs 50±19.2, p=0.029). BDI scores of survivors and non-survivors were not found to be statistically significant (p=0.05 for all). Age, presence of residual urine, and diabetes, albumin, PCS and MCS were entered in the model of Cox-regression analysis. Among these parameters, decrease of 1 g/dl of albumin and being diabetic were found to be the independent predictors of mortality.

References:

Cox-regression analysis. Among these parameters, decrease of 1 g/dl of albumin and being diabetic were found to be the independent predictors of mortality.
Conclusions: We detected that diabetes and hypoaalbuminemia but not HRQoL scores were associated with higher mortality in PD patients after 7 years of following period.

THE ASSOCIATION BETWEEN ARTERIAL STIFFNESS AND FLUID STATUS IN PERITONEAL PATIENTS

Ismail Kocyigit1, Murat Sipahioglu1, Ozcan Orscevik1, Aydin Unal1, Ahmet Celik2, Samer Abbas3, Fansan Zhu1, Bulent Tokgoz1, Ali Dogan2, Octay Oymak1, Peter Kotanko3 and Nathan Levin4

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Introduction and Aims: Our aim was to evaluate the relationship between degree of fluid status and arterial stiffness measured by pulse wave velocity (PWV) in peritoneal dialysis (PD) patients.

Methods: Sixty PD patients were evaluated. Fluid status was determined by different methods including fluid load measured by Body Composition Monitor (BCM), calf normalized resistance (CNR), plasma N-terminal fragment of B-type natriuretic peptide (NT proBNP) and extracellular to intracellular water ratio (ECW/ICW). Patients were stratified in normo- and hypervolemic groups according to their fluid overload (FO). CNR was calculated from resistance at 5 KHz using calf bioimpedance spectroscopy. Lower CNR indicates increased ECM in calf due to hypervolemia.

Separate multivariate linear regression models were used to evaluate the correlations of each fluid status indicators with PWV.

Results: Clinical, laboratory characteristics were given table 1. PWV was higher in the hypervolemic compared to normovolemic patients. Hypervolemic patients had higher NT proBNP levels, a higher ratio of ECW/ICW and lower CPR. NT pro BNP level, ECW/ICW ratio, relative FO, and left ventricular (LV) mass index were positively and NT-proBNP levels, a higher ratio of ECW/ICW and lower CNR. NT-proBNP level, ionized calcium (iCa) and carboxy-terminal telopeptides of collagen type I (ICTx).

Conclusions: Arterial stiffness is increased in fluid-overloaded PD patients. Our results indicated that fluid status might is an independent predictor of PWV.

PERITONEAL DIALYSIS IS ASSOCIATED TO A HIGHER PROPORTION OF 7-84PTH FRAGMENTS. POTENTIAL ROLE ON BONE TURNOVER

M. Carmen Sánchez-González1, Maria Luisa González-Cesáreo2, Emilio González-Pierra3, Marta Ablaita4, Victor Lorenzo5, Vicente Torregrosa6, Elvira Fernández7, Concepcion de la Piedra8 and Mariano Rodríguez9

1Nephrology Service Hospital Universitario La Princesa Madrid Spain, 2Biochemistry Service Hospital Central Gómez Ulla Madrid Spain, 3Nephrology Service Fundación Jiménez Diaz Madrid Spain, 4Hospital Infanta Leonor Madrid Spain, 5Hospital Universitario de Canarias La Laguna Spain, 6Hospital Clinic Barcelona Spain, 7Hospital Arnu v de Villanova Lérida Spain, 8Hospital Universitario Reina Sofia Cordoba Spain

Introduction and Aims: Measurements of parathyroid hormone (PTH) is routinely performed for the diagnosis and management of mineral bone diseases. Unfortunately, measurement of PTH carries several limitations. Recent studies has described a large variety of PTH fragments present in serum with opposite effects. Theoretically, the assessment of these different PTH fragments should be useful to predict bone turnover. There are limited data on the assessment of different PTH fragments in hemodialysis vs peritoneal dialysis (PD) patients. We have studied possible differences in the distribution of circulating PTH fragments according to dialysis type in PD and haemodialysis patients and the relationship of these fragments to metabolic markers of bone turnover.

Methods: In a cross-sectional study, we analysed two dialysis units at tertiary care hospitals: 129 hemodialysis and 73 peritoneal dialysis (PD) patients. We determined: iPTH (1-84PTH plus 7-84PTH), bio-PTH (1-84PTH), total serum calcium (tCa); iCa, ionized calcium (iCa) and carboxy-terminal telopeptides of collagen type I (ICTx).

Results: Hemodialysis and PD patients presented similar iPTH and tCa values. However, iCa accounted for a higher percentage of iCa in PD than in hemodialysis (53% ± 39% p < 0.001) and 1-84PTH as a percentage of iPTH was lower in PD (44.0 ± 12.28% vs. 60.3 ± 10.82% p < 0.001). In the total group iCa was inversely correlated with serum 1-84PTH and 1-84PTH/7-84PTH ratio but not with iPTH. Serum levels of ICTX correlated with 1-84PTH, 1-84PTH/7-84PTH ratio and iPTH. There were no significant differences in the percentage of hemodialysis or PD patients with LTBD when defined according to KDIGO iPTH cut-off levels. However, use of the combined iPTH and 1-84PTH/7-84PTH ratio criteria proposed by Herberth et al (coefficient of 1-84PTH/7-84PTH ratio < 1 and iPTH < 420 pg/mL) resulted in a higher percentage of PD patients predicted to have LTBD (72.7% vs 16.3%, p < 0.001). In a multivariate logistic regression analysis, dialysis modality was the main determinant of the percentage of calcium present as iCa. Similarly, the main determinant of LTBD (defined according to Herberth) was iCa.

Conclusions: PD is associated to a higher proportion of 7-84PTH fragments. This may lead to higher serum iCa and might contribute to the higher prevalence of LTBD in PD.

25-HYDROXY VITAMIN D LEVELS ARE RELATED TO PARAMETERS OF RESIDUAL RENAL FUNCTION IN ADULT PERITONEAL DIALYSIS PATIENTS

Matthias Zeler1, Tanja Monteburini1, Rosa M. Agostinelli1, Rita Marinelli1 and Stefano Santarelli2

1Nephrology Ospedale Carlo Urbani Jesi Italy

Introduction and Aims: There is uncertainty about the importance of vitamin D supplementation in peritoneal dialysis (PD). 25-hydroxy vitamin D (25(OH)D) levels are low in dialysis patients, and seem to show some season variance due to differences in nutrition and sun exposure. Up to now the association between residual renal function and serum 25(OH)D was investigated only in pediatric PD patients. The aim of the study was to analyze the relation between 25(OH)D and residual renal function parameters in adult PD patients.

Methods: Renal function parameters, as daily urine creatinine and urea excretion, weekly creatinine clearance (Crea-Cl), urea clearance (Urea-Cl), fractional excretion of urea (FE-Urea) and renal Kt/V, were analyzed in 32 adult PD patients together with serum 25(OH)D. All patients presented residual diuresis of at least 100 ml per day: 25 (OH)D levels below 20 ng/ml were classified as deficiency and levels between 20 and 30 ng/ml as insufficiency. Furthermore, all patients were under high dose furosemide therapy of at least 250 mg per day, and did not receive oral vitamin D supplementation. Vitamin D receptor agonists (calcitriol or paricalcitol) were given to control calcium-phosphorous-parathormone.

Results: PD patients (mean±standard deviation: age 63±17 years) presented diuresis of 1108±683 ml per day, Crea-Cl of 49±34 1/L/week, Urea-Cl of 23±15 1/L/week, FE-Urea of 0.54±0.16 and Kt/V of 0.68±0.47. Mean values of 25(OH)D were 13.9±7.7 ng/ml. Two patients presented 25(OH)D levels slightly above 30 ng/ml, five patients 25(OH)D insufficiency and the remaining 25 patients deficiency. Serum 25(OH)D correlated to renal creatinine excretion (r=0.35, p=0.049), renal urea excretion (r=0.42, p=0.02), FE-Urea (r=0.40, p=0.02) and Urea-Cl (r=0.41, p=0.02), but not to diuresis, CI-Crea or Kt/V. Patients with higher 25(OH)D levels show relatively increased rates of urinary urea elimination even in relation to creatinine excretion.

25-HYDROXY VITAMIN D LEVELS ARE RELATED TO PARAMETERS OF RESIDUAL RENAL FUNCTION IN ADULT PERITONEAL DIALYSIS PATIENTS

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Conclusions: Serum 25(OH)D levels were in the majority of cases in the range of deficiency. Several parameters of residual renal function were associated to 25(OH)D, especially parameters regarding urea elimination (daily urinary urea excretion, FE-Urea and Urea-G). Whether vitamin D supplementation will have an effect on residual renal function parameters has to be proven in further studies.

<table>
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<th>SP458</th>
<th>VITAMIN D STATUS IN INCIDENT PERITONEAL DIALYSIS PATIENTS AND THE EFFECTS OF ORAL SUPPLEMENTATION</th>
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<tr>
<td>Francesca Bermond1, Cristiana Bagnis1, Cristina Marcuccio1, Giorgio Soragna1, Michela Brunu1, Corrado Vitale2 and Martino Marangella1</td>
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Introduction and Aims: It is known that vitamin D (vit D) deficiency is highly prevalent in uremic patients. Normalization is not always achieved despite oral vitamin D supplementation. In this study we evaluated vit D status, as serum levels of 25(OH)D3, in a cohort of 37 patients (22 males and 15 females, aged 64 ± 15 yrs) who were started on peritoneal dialysis in our Centre between September 2009 and December 2012. The effects of oral supplementation were investigated as well.

Methods: We measured 25(OH)D3, serum calcium and phosphate levels, alkaline phosphatase, intact PTH (iPTH) and pre-albumine, as an index of the nutritional status, at baseline and after treatment. Supplementation was carried out by using either weekly cholecalciferol or daily calcifediol. Deficiency or insufficiency were considered as 25(OH)D3-lower than 15 ng/ml or between 15 and 30 ng/ml, respectively.

Results: On baseline evaluation only 14% of patients had 25(OH)D levels above normal range, whereas 76% were deficient and 10% insufficient. There was no gender difference, while 25(OH)D3 was significantly inversely related to both age (p < 0.01) and nutritional status (p < 0.05). Upon treatment 69% achieved sufficiency, but deficiency (9%) or insufficiency (22%) still occurred. The addition of oral vitamin D yielded a significantly decrease in iPTH (p = 0.03) independently of the use of other medications (active vit D metabolites and/or calcimetics).

Conclusions: In conclusion, this study performed in a subset of uremic patients to be started to peritoneal dialysis, confirms that vit D status is most often altered, more severely in older and malnourished patients. Oral supplementation with our protocols allowed normalization in most but not all patients. It is confirmed that 25(OH)D3 per se is able to decrease iPTH levels.

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<th>SP459</th>
<th>CHOLECALCIFEROL EFFECT ON PTH IN PERITONEAL DIALYSIS PATIENTS</th>
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<tr>
<td>Francesca Martino1, Elisa Scalconzetto2, Maria Pia Rodighiero1, Carlo Crepaldi1 and Claudio Ronco1,2</td>
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Introduction and Aims: The deficiency of 25(OH) vitamin D is a widespread problem in peritoneal dialysis patients. Unfortunately, in peritoneal dialysis patients only few studies evaluated the effects of nutritional vitamin D on mineral metabolism. The purpose of the study is to evaluate the long-term effect of 25(OH) vitamin D supplementation on PTH in peritoneal dialysis patients.

Methods: We performed a cohort study on 68 patients who had peritoneal dialysis for at least 6 months before starting a treatment with cholecalciferol for the subsequent 6 months. We evaluated the following parameters before and after the treatment with vitamin D: calcium, phosphorus, PTH, alkaline phosphatase, and 25(OH) vitamin D. Moreover, in both periods we evaluated therapy with drugs such as calcitriol, calcimimetics and calcium-based binders. Statistical Analysis: All continuous variables were presented as the median values and interquartile range (IQR), while categorical variables were reported as number of cases. Normality of variable distribution was compared continuous variables. The cumulative dosage of cholecalciferol was evaluated as a categorical variable according interquartile range. Univariable and multivariable binary regression models were used to evaluate the PTH reduction event. We defined as PTH reduction event the decrease of at least 20% in PTH value between non-interventional and interventional period.

Results: After six months of cholecalciferol treatment we observed a significant increment in 25(OH) vitamin D level (p = 0.001) and a significant reduction of PTH level (p = 0.038). The decrease of PTH values was significant associated only with cumulative dose of cholecalciferol (OR=1.609; p=0.041) and with calcitriol dosage (OR=1.961; p=0.05). In multivariable regression analysis, both cholecalciferol (OR=1.713; p=0.028) and calcitriol (OR=2.168; p=0.037) doses were independent predictors of PTH decrease.

Conclusions: We showed significant decrease of PTH values during six-month therapy with cholecalciferol.

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<th>SP460</th>
<th>SERUM PHOSPHORUS LEVELS, BUT NOT SERUM CALCIUM AND PTH LEVELS ARE ASSOCIATED WITH ABDOMINAL AORTIC CALCIFICATIONS IN PERITONEAL DIALYSIS PATIENTS</th>
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<td>Samir Seferi1, Merita Froj1, Erilda Lakaj1, Myttar Barbulushi1 and Nestor Theresia1</td>
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1Department of Nephrology - Dialysis - Transplantation University Hospital Center “Mother Teresa” Tirana Albania

Introduction and Aims: Vascular calcifications are important complications in patients receiving PD therapy. Simpler and inexpensive techniques such as plan X-ray can be used to provide important information about vascular calcifications in CAPD patients. Disturbed mineral metabolism has been suggested to play a major contributing role for vascular calcification in ESRD patients. The aim of this study was to evaluate the relationship of abdominal aortic calcifications with biochemical data of mineral metabolism in CAPD patients.

Methods: We conducted a cross-sectional study in 38 stable patients (58.8% males; mean age 55.5 ± 13.6 years; 23.6% diabetics and average duration of dialysis 28.36 ± 16.97 months) treated with CAPD for more than 6 months. Demographic and biochemical data were examined. Plan X-ray images of lateral lumbar spine from all subjects with abdomen empty from diaphysial fluid were studied for calculation of semiquantitative vascular calcification scores as described by Kaupilla. The severity of the anterior and posterior aortic wall calcification were graded individually on a 0-3 scale for each first four lumbar segments and the results were summarized to a score (range 0-24).

Results: Kaupilla scores revealed 21 patients (55.2%) with presence of abdominal aortic calcifications (AAC ≥ 2) and 14 patients (36.8%) with scores higher than 7. The mean AAC score of the study population was 5.03 ± 3.85. We found that serum phosphorus levels increased significantly in patients with AAC score > 2 compared with patients without aortic calcification. SAC score > 0, respectively 5.3 ± 0.3 mg/dl vs 4.2 ± 0.2 mg/dl (P < 0.007). But there was no significant difference in serum iPTH and calcium levels in patients with and without AAC, respectively 427 ± 546 mg/dl vs 348 ± 116 mg/dl and 8.5 ± 0.4 mg/dl vs 8.2 ± 0.3 mg/dl. The reason of the lack of significant difference in iPTH levels probably is related to the presence of either high or low levels of iPTH (high turnover or low turnover bone disease) in the group with aortic calcification. To study further this association we excluded from analysis patients with AAC score = 0, and we found that serum phosphorus levels increased significantly in patients with severe AAC score ≥ 7 comparing with patients with mild AAC score 1-6, respectively 5.6 ± 0.3 mg/dl vs 4.8 ± 0.3 mg/dl (P < 0.01).

Conclusions: Our study demonstrates that abdominal aortic calcifications are highly prevalent in CAPD patients and strongly associated with serum phosphorus levels, but not with serum calcium and iPTH levels.

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<th>SP461</th>
<th>SAGITTAL ABDOMINAL DIAMETER IS AN INDEPENDENT PREDICTOR OF MORTALITY IN INCIDENT PERITONEAL DIALYSIS PATIENTS</th>
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<tr>
<td>Eun-Jin Kim1, Jae Hyun Han1, Hyang Mok Koo1, Fa Mee Doh1, Chan Ho Kim1, Kwang Il Ko1, Mi Jung Lee1, Hyung Jung Oh1, Seung Hyeok Han1, Tae-Hyun Yoo1, Kyu Hun Choi1 and Shin-Wook Kang1</td>
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1Department of Internal Medicine Yonsei University College of Medicine Seoul Republic of Korea

Introduction and Aims: Visceral fat plays a crucial role in the development and the progression of cardiovascular disease. However, the impact of sagittal abdominal diameter (SAD), an index of visceral fat, on clinical outcomes has never been explored in dialysis patients. Therefore, we sought to elucidate the prognostic value of SAD on patient mortality in incident peritoneal dialysis (PD) population.

Methods: SAD was determined prospectively using lateral abdominal X-ray at the time of initial dialysis, and the association of SAD with mortality was evaluated in 418 PD patients.

Results: The mean SAD was 24.5 ± 4.3 cm. During a mean follow-up of 39.4 ± 21.3 months, 97 patients (23.2%) died. SAD was an independent predictor of all-cause (HR [hazard ratio] 1.081, 95% CI [confidence interval] 1.015-1.151, P = 0.015) and cardiovascular mortality (HR 1.119, 95% CI 1.022-1.225, P = 0.015). In addition, SAD provided higher predictive value for all-cause and cardiovascular mortality than body mass index (BMI). In subgroup analysis, higher SAD (≥ 24.2 cm) was significantly associated with all-cause mortality in men (HR 1.996, 95% CI 1.014-3.992, P = 0.045), women (HR 2.476, 95% CI 1.082-5.655, P = 0.032), younger patients (< 65 years) HR 4.260, 95% CI 1.845-9.833, P = 0.001), and the lower BMI group (≥ 22.3 kg/m²) HR 4.033, 95% CI 1.056-13.914, P = 0.034).

Conclusions: SAD on lateral abdominal X-ray was an independent predictor of all-cause and cardiovascular mortality in incident PD patients.

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AN ASSOCIATION OF ENDOTHELIAL DYSFUNCTION AND PLASMA ADMA LEVELS, CARDIAC FUNCTIONS AND METABOLIC PARAMETERS IN PERITONEAL DIALYSIS PATIENTS

Sami Uzun1, Serhat Karadağ2, Metin Yegen3, Metem Gürso3, Savas Ozturk4, Zeliha Aydin2, Abdullah Sumru2, Egeemen Cebeci2, Eray Atalay2 and Rumeysa Kazancioğlu2

1Nephrology-Ordu State Hospital Ordu Turkey, 2Internal Medicine Kafkas University Medical Faculty Kars Turkey, 3Internal Medicine Haseki Training and Research Hospital Istanbul Turkey, 4Nephrology-Haseki Training and Research Hospital Istanbul Turkey, 5Nephrology-Bazilamal Kafkas University Medical Faculty Istanbul Turkey

Introduction and Aims: Chronic kidney disease (CKD) is associated with endothelial dysfunction and increased cardiovascular events. Asymmetric dimethylarginine (ADMA) is accepted as a risk factor for coronary artery disease by causing endothelial dysfunction and vasoconstriction. We aimed in the present study to investigate the relationship between flow-mediated dilatation (FMD) as an indicator of endothelial dysfunction and ADMA levels, echocardiographic and metabolic parameters in PD patients.

Methods: This is a cross-sectional study in which PD patients aged 18-80, with at least three months duration of dialysis and without active cardiac, infectious or malignant diseases, and clinically evident hypervolemia were included. FMD measurement, ADMA levels and echocardiographic parameters were recorded.

Results: Of the 55 patients included, the mean age was 53±15 years. Mean FMD level %10.7±6.5, Mean ADMA level was 81.9±48.0 μmol/L. There was no statistically significant relation between ADMA levels and FMD (p=0.075). We detected negative correlation of FMD with systolic and diastolic blood pressures (p=0.001 and p<0.001, respectively). Patients with hypertension had lower FMD values (p=0.012).

Conclusions: FMD was not related with echo-cardiographic findings, laboratory results and parameters of dialysis adequacy.

THE SPECTRUM OF PODOPLANIN EXPRESSION IN ENCAPSULATING PERITONEAL SCLEROSIS

Dominik Alschner1, Peter Fritz1, Joerg Latus2, Martin Kimmel1, Dagmar Biegler1, Maija Lindeman1, Cieriems D. Cohen1, Rudolf P. Wüthrich1, Stephan Segert2 and Nko Braun1

1Department of Internal Medicine, Division of General Internal Medicine and Nephrology Robert-Bosch-Hospital Stuttgart Germany, 2Department of Diagnostic Medicine, Division of Pathology Robert-Bosch-Hospital Stuttgart Germany, 3Division of Nephrology University Hospital Zurich Zurich Switzerland, 4Margarete Fischer-Bosch Institute of Clinical Pharmacology Stuttgart Germany

Introduction and Aims: Encapsulating peritoneal sclerosis (EPS) is a life threatening complication of peritoneal dialysis (PD). Podooplanin is a glycoprotein expressed by mesothelial cells, lymphatic endothelial cells, and myofibroblasts in peritoneal biopsies from patients with EPS. The goals of the current study were to confirm the overexpression of podooplanin in EPS and describe the morphological pattern of podooplanin in a series of peritoneal biopsies from patients with EPS.

Methods: Included were 20 peritoneal biopsies from patients with the diagnosis of EPS (n=5), patients on PD without signs of EPS (n=5), and control patients (uremic patients not on PD, n=5, non-uremic patients n=5). These were studied by quantitative Real-Time RT-PCR for the expression of podooplanin mRNA. In 24 peritoneal biopsies from patients with EPS, podooplanin and smooth muscle actin (SMA) were localized by immunohistochemistry.

Results: Biopsies from patients with EPS demonstrated significantly elevated levels of podooplanin mRNA (p<0.05). Four patterns of podooplanin distribution were distinguishable. The most common pattern (8 of 24) consisted of organized, longitudinal layers of podooplanin-positive cells and vessels in the fibrotic zone (‘organized’ pattern). 7 of 24 biopsies demonstrated a diffuse distribution of podooplanin-positive cells, accompanied by occasional, dense clusters of podooplanin-positive cells. Five biopsies exhibited a mixed pattern, with some diffuse areas and some organized areas (‘mixed’). These contained cuboidal podooplanin-positive cells within SMA-negative epithelial structures embedded in extracellular matrix. Less frequently observed was the complete absence of, or only focal accumulations podooplanin-positive fibroblasts outside of lymphatic vessels (podooplanin ‘low’, 4 of 24 biopsies). Patients in subgroup exhibited a lower index of systemic inflammation and a more chronic-symptomatic period than in EPS patients with the ‘mixed’ type (p<0.05).

Conclusions: In summary we confirmed the increased expression of podooplanin in EPS, and distinguished EPS biopsies according to different podooplanin expression patterns which are associated with clinical parameters. Podooplanin might serve as a useful adjunct to the morphological workup of peritoneal biopsies.

BODY MASS INDEX AND MORTALITY ON PERITONEAL DIALYSIS: A PROSPECTIVE COHORT STUDY

Yang Kyun Kim1, Hyung Wook Kim1, Ho Chul Song1, Euy Jin Chol2 and Chul Woo Yang1

1Department of Internal Medicine College of Medicine, The Catholic University of Korea Seoul Republic of Korea

Introduction and Aims: Previous studies have demonstrated that increased body mass index (BMI) is associated with decreased mortality in hemodialysis (HD) patients. In patients undergoing peritoneal dialysis (PD), the association between BMI and survival has not been well established. The aim of the study was to examine the association between BMI and mortality in PD patients in the Clinical Research Center (CRC) for End Stage Renal Disease (ESRD) cohort in Korea.

Methods: Patients with PD who were selected from CRC for ESRD, a prospective cohort study on dialysis patients in Korea. Patients were categorized into four groups by quartiles of BMI. Cox regression analysis was used to calculate the adjusted hazard ratio (HR) of mortality with a BMI of quartile 2 (21.35 - 23.48 kg/m²) as the reference.

Results: A total of 900 prevalent patients undergoing PD were included. The median follow-up period was 24 months. The multivariate Cox proportional hazard model showed that the lowest quartile of BMI was associated with an increased mortality (HR 3.00, 95% CI, 1.26-7.15). However, the highest quartile of BMI were not associated with mortality compared with the reference category of BMI quartile 2 (Quartile 3: HR 1.11, 95% CI, 0.93-2.85, Quartile 4: HR 1.64, 95% CI, 0.66-4.06) after adjustment for clinical variables.

Conclusions: Lower BMI was a significant risk factor for death. However, increased BMI was not associated with improved survival in PD patients. These findings indicate that the impact of BMI on mortality is different between PD and HD patients.

RELATIONSHIP BETWEEN RESIDUAL RESERVAL FUNCTION AND FLUID STATUS IN PERITONEAL DIALYSIS PATIENTS

Akihiko Matsuda1, Yousuke Tayama1, Tomonari Oogawa1, Mizuki Iwanaga1, Shinpei Okazaki1, Minoru Hatano1, Tota Kita1, Tatsuke Shimizu1, Hajime Hassegawa1 and Tetsuya Mita1

1Department of Nephrology Satsuma Medical Center, Satsuma Medical University Kagoshima Japan

Introduction and Aims: Residual renal function (RRF) has been recognized as an important factor influencing mortality, morbidity, and quality of life in peritoneal dialysis (PD) patients. However, few PD patients are kept on dialysis for a long period. The aim of the study was to determine the association between RRF and fluid status during the first 3 years on PD.

Methods: In this single-center observational study, we evaluated 48 PD patients at our hospital. The main outcome measure was the slope of the decline in glomerular filtration rate (GFR). GFR was measured using the average of renal creatinine (Cr) and urea clearances. Fluid status was evaluated as the ratio of extracellular water (ECW) to total body water (TBW), measured using multi-frequency bioelectrical impedance analysis. Data included clinical data, urinary protein excretion and PD modality at baseline, and GFR, ECW/TBW, blood pressure, peritoneal urea Cr clearance, dialysate volume, ultrafiltration, dialysate glucose load, and dialysate-to-plasma Cr ratio (D/P Cr) using the fast peritoneal equilibration test were collected semiannually for 3 years. Episodes of peritonitis were also recorded during the observation period.

Results: The average slope of decline for GFR was -1.64±1.93 mL/min/year/1.73 m². In response to loss of RRF, ECW/TBW showed a significant increase over the first 2 years. Multivariance analysis showed that higher baseline GFR (P<0.001), higher baseline protein excretion (P=0.02) and higher average blood pressure during the observation period (P=0.001) were independently associated with rapid declines in GFR. Higher body mass index also showed a significant association with rapid declines in GFR according to univariate analysis. However, no association was seen between slope of decline in GFR and ECW/TBW in comparison analysis between subgroups with more rapid and slower declines in GFR, according to the median slope of decline in GFR, and simple linear regression... Conclusions: Overhydration is not beneficial for the long-term preservation of RRF.
Registry of Peritoneal Dialysis (Registre de Dialyse Peritonéale de Langue Française) between 01/01/2007 and 31/12/2011 and extracted the day-of-week they occurred; this was also done for peritonitis; in addition, we determined the day-of-week patients were transferred to HD.

**Results:** Day-of-week deaths: Monday: 434 – Tuesday: 419 – Wednesday: 454 – Thursday: 436 – Friday: 383 – Saturday: 379 – Sunday: 432. These non significantly different numbers represented from 11.9 to 14.5 % of all deaths, with no significant variation between the years observed. The main causes of death (in % of all deaths) were: non-PD related (66.2 to 70.2 %), coronary artery disease (14.5 to 17.7 %), peritonitis (2.7 to 5.6 %), malnutrition (2.7 to 6.6 %) and cancer (3.0 to 6.0 %), without a day-of-week effect. As to peritonitis, its occurrence was significantly (Spearmain’s rank coefficient = 0.785, p<0.05) different along the week (ranging from 328 to 836 cases or 13.0 % to 33.0 % relative to the mean number of treated patients per year, 2533).

Finally, among 1876 transfers to HD mainly caused by peritonitis, underdialysis and catheter dysfunction, 88 (4.7 %) were decided on a Saturday, and 165 (8.8 %) on a Friday while on the other days, there were 384 to 348. No difference was observed between France and Belgium.

**Conclusions:** In the largest European PD database, there was a day-of-week effect on the occurrence (or reporting) of peritonitis as well as on the rate of transfer to HD, but neither of these were large enough to be of clinical significance.

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**SP468**

**INCREASED TRANS-PERITONEAL GLUCOSE TRANSPORT IN PATIENTS UNDERGOING PERITONEAL DIALYSIS COMPARING TO UREMIC AND INTERMITTENT INSTALLATION OF PERITONEAL DIALYSIS SOLUTION ON UREMIA**

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**Introduction and Aims:** In patients undergoing peritoneal dialysis (PD), peritoneal fibrosis is generally believed to be a principal factor to cause peritoneal insufficiency and further interruption of PD therapy. Recent works reveal that peritoneal fine arteriole stenosis is developed by long-term exposure to PD solution, suggesting possible involvement of peritoneal ischemia in the development of peritoneal insufficiency. The aim of this work was to study the significance of peritoneal ischemia as a deteriorating factor for the peritoneal damages in uremic rats with daily exposure to PD solution.

**Methods:** Renal failure was induced to male SD rats (6 weeks old) by administration of food containing 0.75% adenine for 4 weeks, and then human-use PD solution, Mpd Periterm 400 (100 ml/kg), was injected into peritoneal cavity on 6 days a week for 4 weeks. Following peritoneal equivalent test (PET), visceral peritoneum was sampled for histological, immunohistochemical and molecular biological analysis in control (C), uremic (U) and intermittent installation of PD solution on uremia (PD) groups.

**Results:** In PET study, daily installation of PD solution in the uremic rats showed reduction of ultrafiltration volume (C:3.9±1.1, U: -3.5±1.9, PD: -6.2±2.1 ml), trans-peritoneal glucose transport (D/D,glucose: 0.2±0.01, 0.27±0.04, 0.09±0.01), and an elevation of small solute permeability (D/P,creatinine: 0.75±0.05, 0.91±0.02, 1.16±0.01).

Peritoneal thickness and the number of TGF-β positive cells were both significantly increased in PD group compared to U group. Because the number of peritoneal small vessels has been known to be increased in response to peritoneal ischemia, factor VIII positive cells and pimonidazole positive cells were measured to assess the severity of ischemia associated with installation of PD solution. As a result, both positive cells were increased by daily exposure to PD solution as compared to U group, suggesting increased number of peritoneal vessels in response to the peritoneal ischemia.

**Conclusions:** Present results might indicate that initiation of PD therapy worsened the peritoneal functional. In compatible with previous report that peritoneal small vessel would be increased in the uremic cases and be increased more in cases with PD therapy in compensation to the fine arteriole stenosis, it was suggested that PD therapy itself might induce the stenosis of peritoneal fine arteriole and resultant ischemia, possibly leading to the peritoneal insufficiency.

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**SP469**

**ZINC SUPPLEMENTATION ATTENUATES HIGH GLUCOSE-INDUCED EPITHELIAL-TO-MESENCHYMAL TRANSITION OF PERITONEAL MESOTHELIAL CELLS**

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**Introduction and Aims:** Zinc (Zn) plays an important role in preventing many types of epithelial-to-mesenchymal transition (EMT)-driven fibrosis in vivo. But its function in the EMT of the peritoneal mesothelial cells (PMCs) remains unknown. Here, we studied the Zn effect on the high glucose (HG)-induced EMT in the rat peritoneal mesothelial cells (RPMCs) and the underlying molecular mechanisms.

**Methods:** RPMCs were isolated, cultured and passaged by enzymatic disaggregation, then identified by phase contrast inverted microscope, transmission electron microscope with immunocytochemistry method. RPMCs were incubated with 120μM HG for 48 hours, or incubated with 120μM HG for 24 hours followed by 120μM HG for 48 hours. RPMCs in the control group were just incubated with medium. The expression of α-SMA, F-actin, vimentin, E-cadherin, P-cadherin and N-cadherin were measured by Western Blot. In addition, EMT analysis was performed to investigate the change of TGF-β1 in the culture medium. Reactive oxygen species assay

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**SP467**

**SIGNIFICANCE OF PERITONEAL INSUFFICIENCY IN THE DEVELOPMENT OF PERITONEAL DIALYSIS RATES IN PATIENTS UNDERGOING PERITONEAL DIALYSIS**

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**Introduction and Aims:** In patients undergoing peritoneal dialysis (PD), peritoneal fibrosis is generally believed to be a principal factor to cause peritoneal insufficiency and further interruption of PD therapy. Recent works reveal that peritoneal fine arteriole stenosis is developed by long-term exposure to PD solution, suggesting possible involvement of peritoneal ischemia in the development of peritoneal insufficiency. The aim of this work was to study the significance of peritoneal ischemia as a deteriorating factor for the peritoneal damages in uremic rats with daily exposure to PD solution.

**Methods:** Renal failure was induced to male SD rats (6 weeks old) by administration of food containing 0.75% adenine for 4 weeks, and then human-use PD solution, Mpd Periterm 400 (100 ml/kg), was injected into peritoneal cavity on 6 days a week for 4 weeks. Following peritoneal equivalent test (PET), visceral peritoneum was sampled for histological, immunohistochemical and molecular biological analysis in control (C), uremic (U) and intermittent installation of PD solution on uremia (PD) groups.

**Results:** In PET study, daily installation of PD solution in the uremic rats showed reduction of ultrafiltration volume (C:3.9±1.1, U: -3.5±1.9, PD: -6.2±2.1 ml), trans-peritoneal glucose transport (D/D,glucose: 0.2±0.01, 0.27±0.04, 0.09±0.01), and an elevation of small solute permeability (D/P,creatinine: 0.75±0.05, 0.91±0.02, 1.16±0.01).

Peritoneal thickness and the number of TGF-β positive cells were both significantly increased in PD group compared to U group. Because the number of peritoneal small vessels has been known to be increased in response to peritoneal ischemia, factor VIII positive cells and pimonidazole positive cells were measured to assess the severity of ischemia associated with installation of PD solution. As a result, both positive cells were increased by daily exposure to PD solution as compared to U group, suggesting increased number of peritoneal vessels in response to the peritoneal ischemia.

**Conclusions:** Present results might indicate that initiation of PD therapy worsened the peritoneal functional. In compatible with previous report that peritoneal small vessel would be increased in the uremic cases and be increased more in cases with PD therapy in compensation to the fine arteriole stenosis, it was suggested that PD therapy itself might induce the stenosis of peritoneal fine arteriole and resultant ischemia, possibly leading to the peritoneal insufficiency.
Experiments were performed using the reactive oxygen species assay kit (Beyotime, Haimen, China) according to the manufacturer’s instructions.

Results: We found that Zn supplementation significantly inhibited TGF-β1 and ROS production, and reduced the HG-induced EMT in the RPMCs, likely through inhibition of MAPK, NF-κB and TGF-β/Smad pathways.

Conclusions: These results indicate that Zn can inhibit EMT in HG-induced RPMCs by inhibition of TGF-β1 production as well as MAPK, TGF-β/Smad pathways activation.

**SP470 INCREASED RESIDUAL RENAL FUNCTION AFTER START OF PERITONEAL DIALYSIS**

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Introduction and Aims: Preservation of residual renal function (RRF) is one of the most important aims in peritoneal dialysis (PD). In the last decade, consensus was reached about the positive effect of RRF on outcomes. Avoidance of nephrotoxic exposure is therefore strongly recommended in PD patients (pts). We conducted a retrospective observational study to investigate the trend of RRF in our PD pts during the first 6 months of follow up.

Methods: Data was collected from 37 adult pts admitted between 2009-2012. All patients were initiated on continuous ambulatory peritoneal dialysis (CAPD). PD modality was eventually changed to automated PD (APD) in accordance to the results of modified peritoneal functional test. Glimler filtration rate (GFR) was estimated by the arithmetic mean of urea and creatinine clearance. A 15% variation in GFR from baseline was considered a cut off value to define a significant change in RRF. We considered a GFR increment greater than 15% as an increase in RRF, a GFR reduction more than 15% as a decrease in RRF and any other GFR variation as a stable RRF. Hydration status was evaluated using bioimpedence through the Body Composition Monitor (Fresenius Medical Care).

Results: Baseline GFR was 6.6±2.7, 3 and 6 months GFR value was 6.8±3.5 and 7.6±4.5 respectively (p=ns). Urinary volume at baseline was 1746±617; after 3 months a significant reduction occurred (1474±608, p=0.006). 17 pts (45%) showed an increase in RRF: 13 pts had an increase in GFR after 3 months, while the remaining 4 pts showed an increase after 6 months. Mean variation in GFR was 68±53% (19%-222%), which corresponds to an absolute value of 3.18±2.62 ml/min (0.9-11.2 ml/min). No association between the increase in RRF and age, gender, comorbidities or hydration status at baseline was found. No significant correlation was found between increase in RRF and baseline GFR, even though 12 pts (70%) with increased RRF had baseline GFR < 7 ml/min.

Conclusions: In the last few years many efforts have been made to find a strategy to further decrease the slope of RRF reduction in PD pts. Our preliminary results show that a clinically relevant increase in RRF during the first 6 months of follow up is indeed possible. It is reasonable to believe that the hemodynamic improvement achieved after starting dialysis can be responsible for better heart performance and increased renal perfusion that can in turn lead to an increase in RRF. However, further investigation is needed to identify factors which may be related to an increase in RRF in PD pts.

**SP471 COMPARISON BETWEEN UREA DISTRIBUTION VOLUME DETERMINED FROM MULTIFREQUENCY BIOMEPDANCE AND WATSON FORMULA IN PERITONEAL DIALYSIS PATIENTS**

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Introduction and Aims: Antropometric formula of Watson is standard used to measure Urea Distribution volume (VUrea) and derived Kt/V Urea. Multifrequency Bioimpedance analysis is a new validated tool to measure patient body composition, hydration status and nutrition parameters. The aim of this study is to evaluate the difference between VUrea with the two methods and evaluate the impact on weekly dialysis dose (Kt/V).

Methods: We measured Urea distribution volume using BCM (VUrea) in 54 stable Peritoneal Dialysis (PD) patients, and compared with Urea distribution volume using antropometric Watson formula (VWatson) and determined VUrea variation between the two methods (ΔVUrea(Watson-BMCM)). We excluded BCM1 in the excluded BCM presentations with quality < 90% and error > 35%. Using the two VUrea determinations, we calculated the weekly Kt/V and also determined the variation between Kt/VWatson and Kt/VUrea (ΔKt/V).

Results: VWatson was positively associated with ΔVUrea (r=0.21, P=0.02). Use of ACE-i/ARB was associated with higher ΔVUrea. ΔVUrea was positively associated with ANGII system activity (P=0.01) and ACE-i/ARB use (P=0.001). The difference between VWatson and VBCM(p<0.001) and weekly Kt/V BCM was 0.21±0.27 higher than Kt/V Watson (p<0.001).

Conclusions: VWatson overestimate VUrea and leads to significant systematic underestimation of dialysis dose in PD patients. This is even more important in Obese patients and in patients with low protein intake, in whom BCM® give us an additional and important information about body composition variables that significantly influence such error.

**SP472 ULTRAFILTRATION AT THE BEGINNING OF INCREMENTAL RESIDUAL RENAL FUNCTION (iDOP): USEFUL, HARMFUL OR FUTILE?**

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Introduction and Aims: Elective start of low-dose PD, with further increase of dialysis dose to match progressive residual renal function (RRF) loss, is increasingly used in CKD 5 patients, due to patient/care provider preference and satisfactory clinical results. Although RRF plays a pivotal role for the outcome of iPD, its course during this modality has been scarcely investigated. Aim of the present prospective observational cohort study was to examine the evolution of RRF as a function of some potential conditioning factors such as baseline patient’s characteristics, CKD progression prior to dialysis initiation, modality of PD (manual versus automated), ultrafiltration (UF), diuresis and ACE-i/ARB use according to a monitoring module.

Methods: Twenty-one consecutive CKD 5 patients, 12 m and 9 f, aged 49±16 years, range 21-74, starting manual (n=15) or automated (n=6) iPD with a residual GFR of 7.58±5/min (95% CI 6.58 to 8.72) were included. All the patients had serial quarterly determinations of small solute clearances, RRF and PD dose and drugs prescriptions. Mean UF and diuresis were collected and analyzed. PD prescription was adjusted to meet currently recommended adequacy targets.

Results: RRF loss was significantly mitigated after the institution of PD, up to 2 years (from 0.60±0.36 to -0.22±0.21 ml/min/month, P=0.0004), regardless of PD modality. On univariate and multiple regression analysis only mean UF was associated with RRF decline (adjusted R²= 0.21, P=0.02). Use of ACE-i/ARB was associated with higher UF (728±58 ml/day, 95% CI 593 to 864, vs 324±58 ml/day, 95% CI 234 to 415, P=0.0001) and less average urine output (1166±58 ml/day, 95% CI 1003 to 1328, vs 1550±58 ml/day, 95% CI 1388 to 1711, P=0.001) but only marginally affected RRF preservation (-0.19±0.5 ml/min/month, 95% CI -0.31 to -0.07 vs -0.35±0.5 ml/min/month, 95% CI -0.59 to -0.1, P=0.24). Initial PD dose was significantly higher in patients on incremental iPD (14±5 ml/h, 95% CI 1.2 to 21.2, vs 2±3 ml/h, 95% CI -0.01 to 0.01), the difference decreasing gradually with time until becoming not significant at 2 years. During this time, 7 patients previously on manual iPD had switched to APD. Time to the first increase of dialysis dose was significantly shorter in patients who started with manual PD. Eleven patients experienced 20 episodes of peritonitis (cumulative incidence 0.32 episode/patient/year). During a mean follow up of 34 months (95% CI 23 to 46), 3 patients received a renal transplant, 4 patients switched to HD after 12 to 27 months, 5 patients died after 33 to 63 months.

Conclusions: Incremental PD represents a safe and clinically valuable first renal replacement therapy (RRT) option. Overzealous UF should be avoided because of its possible negative effect on RRF preservation, that appears to be the major beneficial result of this RRT strategy.

**SP473 BLOOD PRESSURE AND RESIDUAL RENAL FUNCTION IN PERITONEAL DIALYSIS: ROLE OF LOCAL RENIN ANGIOTENSIN SYSTEM ACTIVATION**

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Introduction and Aims: Hypertension is an important cause of cardiovascular morbidity and mortality in patients with end stage renal disease under peritoneal dialysis.
dialysis treatment. Recent studies showed that local renin-angiotensin system activity in the kidneys may have a role in the pathogenesis of hypertension and kidney damage in patients with chronic kidney disease. Purpose of this study is to investigate the effect of local renin-angiotensin system activity on hypertension and residual renal function in peritoneal dialysis patients.

Methods: Fifty peritoneal dialysis patients with residual urine were included in this study. Patients were divided into two groups as hypertensive (n=30) and non-hypertensive (n=20). Urine angiotensinogen/creatinine ratio, as an indicator of local renin-angiotensin system activity, is measured in all patients. This ratio is compared between two groups and also factors affecting this ratio are investigated.

Results: There was no significant difference in the urine angiotensinogen/creatinine ratios between two groups. Correlation analysis showed that urine angiotensinogen/creatinine ratio had a significant negative correlation with residual renal function determined by 24 hour creatinine excretion (r=-0.397, p=0.004). There was a positive correlation between urine angiotensinogen/creatinine ratio with proteinuria (r=0.289, p=0.049) [Figure 2] and negative correlation with serum albumin levels (r=-0.280, p=0.049). However, we could not find any association between urine angiotensinogen/creatinine ratio and neither systolic nor diastolic blood pressure values.

Conclusions: This study showed that local renin-angiotensin aldosterone system activation in kidney reflected by urinary angiotensinogen may be associated with residual renal function and proteinuria in peritoneal dialysis patients; however, high blood pressure was not correlated with urinary angiotensinogen levels.

Abstracts

The Relation Between Apelin Levels, Echocardiographic Parameters and Carotid Intima Media Thickness in Peritoneal Dialysis Patients

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Introduction and Aims: Inflammation, oxidative stress, and obesity are important features associated with pathogenesis of cardiovascular diseases. The occurrence of cardiovascular diseases (CVD) is markedly increased and it is the most important cause of mortality in patients with chronic kidney disease (CKD). Apelin is an adipokine involved in a variety of physiological functions. Serum levels of Apelin increase in heart failure, it is associated with endothelial functions and take a role in the fluid homeostasis. Apelin may also be associated with increased mortality due to CVD. The aim of this study was to test whether Apelin levels might be associated with carotid artery atherosclerosis and left ventricular mass index (LVMI) in peritoneal dialysis patients.

Methods: Fifty peritoneal dialysis patients (25 male, 25 female, mean age 41.4±11.9 years, mean dialysis vintage 65.0±35.4 months) and 18 healthy individual (9 male, 9 female, mean age 41.7±6.8 years) were included in this cross-sectional study. All subjects underwent echocardiographic examination to assess LVMI and B-mode carotid artery doppler ultrasound examination to assess atherosclerosis by measuring the intima-media thickness of the common carotid arteries (CIMT). Serum Apelin concentrations were measured using a Human Apelin ELISA kit and CRP levels by immunonephelometric assay.

Results: There were no difference between patient and control groups with regard to demographic characteristics. In patient group, LVMI, CIMT, CRP and Apelin levels were elevated compared to control group. However there was no association between Apelin, LVMI and CIMT. There was a positive correlation between Apelin and CRP, which was statistically marginally significant (p=0.05). When patients were divided in to two groups according to mean serum Apelin levels, LVMI, CIMT and CRP were higher in the high Apelin group but this difference did not reach statistical significance.

Conclusions: We observed an increased inflammation and target organ damage in peritoneal dialysis patients. However serum Apelin levels seem not to be associated with cardiovascular risk in this group of patients.

PLASMA HYDROGEN SULFIDE IMPROVES ERYTHROCYTE ELONGATION INDICES IN PATIENTS UNDERGOING PERITONEAL DIALYSIS

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Introduction and Aims: In ESRD patients increased mortality due to complications from cardiovascular disease is observed. Growing evidence, from experimental and clinical studies points, that oxidative stress may be implicated in the pathogenesis and complications of ESRD. Additionally, renal replacement therapy may aggravate the production of reactive oxygen species and long time of treatment may intensify depletion in antioxidant defense in vascular endothelium and erythrocytes leading to changes in red blood cell deformation. One of the important serum marker of oxidative stress is a product of lipid peroxidation malondialdehyde (MDA) concentration. The increase of free radicals is the reason of lipid peroxidation taking place in erythrocytes membranes including the
oxidation of polyunsaturated fatty acids and phospholipids. It was demonstrated that hydrogen sulfide, synthesized in the endothelium, protects from hypoxia-reoxygenation injury via reaction with superoxide anion and hydrogen peroxide. Antiatherogenic action of H2S is directly related with prevention against hemin-mediated oxidative modification of LDL and decrease in release of oxidized phospholipids from atherosclerotic plaque. The present study was designed to evaluate probable links between plasma total hydrogen sulfide and malondialdehyde concentrations, as well as red blood cells deformation (elongation index, EI) and length of peritoneal dialysis.

Methods: Thirty four patients (14 women and 20 men) undergoing regular peritoneal dialysis treatment were enrolled in the study. The median age of patients was 69 years (range 21-77 years) and they underwent peritoneal dialysis from 1 to 141 months (median 23). The modified spectrophotometrical method by Fogo and Popowsky for measurement of total plasma sulfide was used in this study. This method is based upon the reaction of sulfide with N,N-dimethyl-p-phenylenediamine sulfate to form methylene blue. Red blood cells deformation was measured as elongation index with Shear Stress Diffractometer Rheodyn SSD (Myrenne Gmbh, Germany).

Results: Significant and positive Pearson's correlation was observed between dialysis time and creatinine concentration (r=0.25; p=0.03), whereas H2S concentration (r=-0.15; n.s.) and red blood cells elongation indices decreased with increased dialysis duration (r = -0.27; p=0.04). Hydrogen sulphide concentration correlated negatively with level of MDA (r = -0.25; p=0.05), while red blood cells EI increased with increase of hydrogen sulphide concentration (r =0.35; p<0.05).

Conclusions: Results shown in this study confirm that length of peritoneal dialysis may predispose erythrocytes to decrease in deformability especially at the shear stresses occurring in capillary vessels. Hydrogen sulfide or H2S donors may play a key role in prevention of disturbances in the flow of erythrocytes through the capillary.