DIALYSIS. PATHOPHYSIOLOGY AND CLINICAL STUDIES

MP507
ULTRAFILTRATION VOLUME AND FIBROBLAST GROWTH FACTOR 23: A POSSIBLE LINK BETWEEN VOLUME HOMEOSTASIS AND PHOSPHATE METABOLISM IN HEMODIALYSIS PATIENTS

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Introduction and Aims: A high level of fibroblast growth factor 23 (FGF23) is a risk factor for mortality, and recent studies have linked FGF23 to parameters of volume homeostasis and an increased risk of heart failure. In hemodialysis (HD), a large ultrafiltration volume (UFV) is also associated with an increased mortality risk. We aimed to investigate whether circulating FGF23 levels and ultrafiltration volume are related in a cohort of stable HD patients.

Methods: Post-hoc analysis on a prospective cohort study of 104 HD patients, median age 66 (interquartile range 51-75) years, dialysis vintage 25.0 (8.5-51.2) months, who underwent a standard four-hour HD session at the first session of the week. Blood samples were drawn at onset of HD. Plasma C-terminal FGF23 was determined by ELISA. Residual renal function (RRF) and Kt/V were extracted from patient records. We used uni- and multivariate linear regression to assess the association between UFV and FGF23. Natural log (Ln)-transformation was applied when appropriate.

Results: At start of the HD session the median FGF23 level was 7535 (interquartile range 3276-13433) RU/mL. Mean UFV throughout the HD session was 2561 (standard deviation ±771) mL. In univariate analysis, natural log-transformed (Ln) FGF23 levels correlated with UFV (Figure 1), and also with serum phosphate (R=0.387, P<0.001), age (R=-0.384 P<0.001), and Ln Kt/V (R=-0.252 P=0.01), but not significantly with calcium (R=0.167 P=0.09). Multivariate linear regression analysis revealed a consistent strong association between Ln FGF23 AND UFV (St. β 0.385, P<0.001), in a model adjusted for serum phosphate (Standardized β 0.451, P<0.001) and serum calcium (St. β 0.222, P=0.002; model R2 52%). Age, gender, dialysis vintage, Kt/V, systolic and diastolic blood pressure did not contribute to this model. The association between FGF23 and UFV was independent of serum phosphate (Figures 1, 2). Patients with relevant residual renal function had a trend for lower FGF23 levels (Mann-Whitney P=0.04, Spearman’s Rho -0.230 P=0.04), however RRF was no correlate of FGF23 in multivariate analysis (St. β -0.111, P=0.16).
Conclusions: In a cohort of stable HD patients we found an association between FGF23 and UVF, independent of serum phosphate. Our findings are in line with the role of exaggerated sympathetic nerve activation in patients with large UVF, as it was recently reported in hypertensive patients with high FGF23 release from the bone (Kawai M et al J Biol Chem 2014). Further research on this novel connection between deranged volume and phosphate homeostasis in HD patients are urgently needed and may provide clues to better integrated management of these high risk patients.

Introduction and Aims: Advanced glycation end products (AGEs), in addition to being a complication of diabetes, are known to be associated with cardiovascular complications in renal failure patients, especially those undergoing dialysis, and malnutrition. Home hemodialysis (HHHD) patients tend to have longer dialysis duration and more frequent dialysis than center hemodialysis (CHHD) patients. We report plasma pentosidine (Pent) levels in an HHHD group that worked during the day and a CHHD group that worked during the day and received HD in the HD clinic at night. The aim of this study is to evaluate whether the plasma Pent level of HHHD patients is lower than that of CHHD patients, and whether HHHD is effective in eliminating Pent.

Methods: The subjects were 20 HD patients (mean age: 50.5±9.8 years, HD history: 150.0±57.5 days, BW: 63.4±7.0 kg, HD time: 5:11.0±0.6 h/session, 17.2±4.8/session, hemodialysis product (HDP): 63.3±20.0, KT/V: 1.60±0.22) and 28 CCD patients (mean age: 54.5±9.7 years, HD history: 144.3±103.3 days, BW: 61.2±12.2 kg, HD time: 4:50±0.5 h/session, 13.6±1.4/h/kw, HDP: 40.9±4.2, KT/V: 1.45±0.22). There were 2 diabetes mellitus (DM) patients in the HDP group and 3 DM patients in the CHHD group. Plasma Pent levels were measured using an ELISA kit (Fushimi Pharmaceutical Co., Japan), and then compared between the HHHD and CHHD groups. Correlations between the following items and plasma Pent levels were investigated. A) HD duration and frequency; B) HD adequacy: KT/V; C) dialysis duration/session; D) dialysis duration/month, number of dialysis sessions/month, hemodialysis product (HDP); E) HDP adequacy: KT/V.

Results: 1) The plasma Pent level was 0.225±0.07 μg/ml in the HDP group (n=20) and 0.348±0.041 μg/ml in the CHHD group (n=28), significantly lower in the HDP group (P=0.007). Excluding DM patients, the plasma Pent level was 0.229±0.008 μg/ml in the HDP group (n=18) and 0.347±0.046 μg/ml in the CHHD group (n=25). Thus, plasma Pent was significantly lower in the HDP group (P=0.019) even when DM patients were excluded. 2) Plasma Pent levels showed inverse correlations with HD duration/session (R = 0.404, P = 0.004), total HD duration/month (R = -0.408, P = 0.004), number of HD sessions/month (R=0.296, P=0.041) and HDP (R = -0.037, P = 0.195). However, no correlation was seen with KT/V.

Conclusions: Plasma Pent levels were significantly lower in the HHHD group than in the hospital CHHD group, and this group may therefore have lower expression of dialysis complications. This is thought to be due to the longer HD duration and more frequent HD in HHHD.

Introduction and Aims: The calcium mass balance during hemodialysis and the effect of different transport mechanisms in dialyzer on calcium removal or absorption were recently debated. However, the role of two different forms of calcium in dialysis fluid - ionic and diffusible but complexed to small anions - in net calcium balance was not assessed yet. Methods: Eighteen patients on HD were examined during three consecutive HD sessions of one week dialysis treatment cycle (with the interdialytic breaks of 2-2-3 days and calcium 1.25 mmol/L) and before the fourth session. Total and ionic calcium concentrations were measured in serum before, at 1, 2 and 3 h, and at the end and 45 min after each session, and every 0.5 h in the outlet dialysate. The removed mass was calculated from the differences in calcium in inlet and outlet dialysis fluid and dialysis fluid flow rate. The contribution of ultrafiltration to calcium transport was evaluated as ultrafiltration rate multiplied by calcium concentration in dialysate. The mass transported by diffusion was calculated as the difference between the total mass and the mass removed by ultrafiltration. The concentration of complexed calcium in dialysate was calculated as the difference between concentration of total calcium and ionic calcium. Results: The measured concentration of calcium in inlet dialysate fluid was 3.57 ± 0.48 mg/dl with 786 ± 4.2 % in ionic form, and at the outlet it was on average 5.25 ± 0.69 mg/dl (NS) with the fraction of ionic form decreased to 750 ± 4.2 % (p < 0.0001). The concentration of complexed calcium in dialysis fluid increased from 1.16 ± 0.31 mg/ml at the inlet to 1.34 ± 0.29 mg/dl at the outlet of dialyzer. The removal of calcium was observed in 35 dialysis sessions, whereas in 19 sessions calcium was absorbed from dialysate. The removed calcium mass was on average 52 ± 242, range 706 to -739, mg, but concomitantly 187 ± 203, range -129 to 827, mg of ion calcium was absorbed. Thus, 239 ± 261, range -592 to 842, mg of complexed calcium was removed. The absorption of calcium ion was mostly by diffusion (284 ± 202, range -56 to 933, mg) with some contribution of ultrafiltration (12 ± 34, range 28 to 197, mg). Complexed calcium ions were also removed mostly by diffusion (206 ± 260, range -608 to 827, mg) with some contribution of ultrafiltration (33 ± 14, range 7 to 69, mg). The corrective removal of total, ionic and complexed calcium was higher during the session after the long interdialytic break with high ultrafiltration than during the other two sessions. Less calcium ions were absorbed during the session after long interdialytic break than during the other two sessions. No statistically significant difference was found for total calcium mass removed during individual sessions; the mass removed by diffusion of all calcium forms was not different either.

Conclusions: We conclude that in hemodialysis patients on standard calcium concentration in dialysis fluid, a high variation in calcium mass balance in dialyzer is present. Whereas total calcium tends to be removed on average, it is mostly in the ionic form and the absorption of free calcium ions dominates in most dialysis sessions. Diffusion is the prevalent mechanism of transport of both ion and complexed forms of calcium. Absorption of calcium ions was higher during the two sessions after short dialysis breaks than during the session after long break. Our results demonstrate that the role of different forms of calcium in the body that balances the absorption of ionized calcium to the body.
Conclusions: Heparin is a risk factor in dialysis patients, particularly in those with hemorrhagic diathesis, anticoagulant therapy or with a long hemorrhage time at the end of HD treatment. Combining Citrate in dialysis fluid and heparin-grafted membrane could, based on our preliminary data, routinely halve the heparin dose in the 100% of ESRD patients treated with UFH and decrease of 30% the heparin dose in patients treated with LMWH. Further studies to validate our data and to investigate further decrease in the dose of heparin are required.

**MP511 NEW INSIGHTS INTO THE EFFECT OF HEMODIAFILTRATION ON MORTALITY: THE ROMANIAN EXPERIENCE.**

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**Introduction and Aims:** Despite improvements in the complex management of dialyzed patient’s morbidity and mortality rates remain unacceptably high. It was hypothesized that the removal of larger metabolites by hemodiafiltration (HDF) could be a potential approach to improve dialysis outcomes. Three large randomized controlled trials have recently been published. With the exception of the ESHOL study, they failed to show an improvement in survival associated with HDF treatment as compared with hemodialysis (HD). Two meta-analyses reported different results on all-cause mortality, but both confirmed a reduced cardiovascular mortality in HDF treated patients.

**Methods:** We tested this hypothesis by retrospectively analyzing all available patients on April 1, 2013 (N=4942) from the Romanian Fresenius Medical Care Database. We conducted two types of analyses. In the first one we analyzed all patients that were on dialysis March 1st 2010 and considered only those patients that were performing HDF treatment at that moment (prevalent patients). In the second one we analyzed all patients that started dialysis between March 1st 2010 and April 1st 2013 and used two definitions for the HDF group: ≥ 30 or 50% of all dialysis sessions using HDF (incident patients).

**Results:** In the intention-to-treat approach 1546 patients were considered for the final analysis. There were more men in the HDF group, with a longer dialysis vintage, a higher prevalence of diabetes and a Charlson index score of ≥ 3. Patients in the HDF group had a better anaemia control, with higher hemoglobin and ferritin levels and with a lower usage of erythropoietin stimulating agents. Although in the univariate analysis there was a better survival in the HDF group (HR=0.67, CI=0.46-0.96, p=0.029), after adjustment for all univariate predictors of death, only chronic heart failure, albumin, iPTH, alkaline phosphatase and eKt/V remained significantly associated with mortality risk. In the second analysis we included 2447 incident patients. In the HDF group (as per definition ≥ 50% of all dialysis sessions) patients were younger, had longer dialysis vintage, and a higher prevalence of male sex and diabetes. Patients in either predominant HDF treatment at that moment (prevalent patients). In the second one we analyzed all patients that started dialysis between March 1st 2010 and April 1st 2013 and used two definitions for the HDF group: ≥ 30 or 50% of all dialysis sessions using HDF (incident patients).

**Conclusions:** Despite improvements in the complex management of dialyzed patients, morbidity and mortality rates remain unacceptably high. It was hypothesized that the removal of larger metabolites by hemodiafiltration (HDF) could be a potential approach to improve dialysis outcomes. Three large randomized controlled trials have recently been published. With the exception of the ESHOL study, they failed to show an improvement in survival associated with HDF treatment as compared with hemodialysis (HD). Two meta-analyses reported different results on all-cause mortality, but both confirmed a reduced cardiovascular mortality in HDF treated patients.

**Conclusions:**

The present study was treated 3x/week for volume CV. The magnitude of the reached CV was monitored after finishing the step-wise protocol and 4 and 8 weeks thereafter.

**EFFECT OF HEMODIALYSIS DURATION ON PARAMETERS OF ADEQUACY AND ALL-CAUSE MORTALITY – 24 MONTHS FOLLOW UP**

**Introduction and Aims:** Weekly duration of hemodialysis is traditionally 12 hours, and randomized controlled iHemo trial found no advantage in survival with higher dialysis dose or using high-flux dialysis membrane. However, experiences of French authors showed that the length of hemodialysis treatment is associated with benefits concerning Mb and Mt of dialysis patients. The aim of study was to compare the parameters of anemia, malnutrition, inflammation, mineral metabolism and survival rate, depending on the duration of hemodialysis treatment.

**Methods:** A total of 206 hemodialysis patients were divided into 2 groups according to the total weekly duration of dialysis treatment: group I (≤ 15 h) and group II (≥ 15 h weekly HD). We analyzed one-year average biochemical parameters, and 24 months patients’ survival.

**Conclusions:**

The study or dropped out at any time. After the step-up protocol, which took 6 weeks at max, 35 patients (89.7%) had reached a CV of ≥ 22L (max 32L; mean 28 L). 4 weeks thereafter, 4 dropped out due to various reasons. Of the remaining 33, 33 still reached ≥ 22L CV (max 30.11; mean 26.91 L). 8 weeks after the step-up protocol was finished, 33 patients remained, of whom 31 reached ≥ 22L CV. Mean CV was 26.8L. Overall, of 39 patients participating in the study, in 31 (79.2%) a high CV was achieved consistently. Baseline data between participants and non-participants (n=33) did not differ with respect to demographic variables, primary diagnosis, dialysis treatment, laboratory values and use of antihypertensive medication.

**Conclusions:**

In the great majority of ESRD patients, high volume HDF can be reached consistently with a structured treatment protocol.
Results: Patients with longer duration of dialysis were significantly younger and they had longer dialysis vintage (Table 1). They had significantly higher Hb level (despite of less frequent use of ESA), s-albumin level, s-calcium level and Kt/V and lower iPTH values and less frequent use of P-binders. According to Kaplan-Meier survival analysis the patients with longer duration of dialysis treatment had significantly better two-year survival than patients with shorter duration of treatment (Figure 1). Cox proportional hazards model confirmed that longer dialysis treatment caused a significant, 68 % RR reduction of mortality compared to shorter dialysis treatment (HR 0.32; 95 % CI 0.115 - 0.901; P=0.012).

Conclusions: We concluded that longer duration of hemodialysis (≥15 h) had beneficial effect of anemia indices and mineral metabolism and on 2-year patients survival as compared with standard dialysis regimen (12 h).

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>RR (CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y.)</td>
<td>0.5</td>
<td>0.72 (0.56 - 0.93)</td>
<td>0.011</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.33</td>
<td>3.15 (1.04 - 1.06)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hemodialysis vintage</td>
<td>-0.071</td>
<td>0.49 (0.44 - 0.55)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hours of HD per week</td>
<td>-0.232</td>
<td>0.79 (0.69 - 0.91)</td>
<td>0.001</td>
</tr>
<tr>
<td>Transfusions per year</td>
<td>0.04</td>
<td>1.05 (1.01 - 1.08)</td>
<td>0.016</td>
</tr>
<tr>
<td>Diabetic nephropathy, yes</td>
<td>0.63</td>
<td>1.89 (1.37 - 2.60)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Kt/V above 1.2</td>
<td>-0.354</td>
<td>0.70 (0.58 - 0.85)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hb above 100 g/L</td>
<td>0.617</td>
<td>0.62 (0.51 - 0.75)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hb above 110 g/L</td>
<td>-0.402</td>
<td>0.67 (0.54 - 0.84)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Conclusions: Age, gender, duration of HD treatment, hours of HD/week, number of transfusion per year and diabetic nephropathy were selected as significant independent predictors of HD patient mortality. The relative risk of mortality was associated with being outside the guidelines targets for Kt/V and Hb, but not outside the target ranges for Ca, PO4 andPTH.

**MP514**

**PREDICTORS OF MORTALITY FOR PATIENTS ON REGULAR HEMODIALYSIS IN SERBIA**

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**Introduction and Aims:** Mortality rates among hemodialysis (HD) patients vary greatly between different regions primarily due to the different treatment options but also due to different standards of treatment. The aim of the present study was to find out factors associated with mortality of patients on regular HD in Serbia and to evaluate whether the target levels proposed in the guidelines are associated with patient outcomes.

**Methods:** The three-year follow-up study included 2153 patients on regular HD in 23 HD centers in Serbia (~50% of overall HD population in Serbia). There were 833 females, aged 18-90 (59±12.5) years, dialyzed averagely 11.8±1.9 hours/week. Patients were followed from January 2010 to December 2012. Demographic, clinical and laboratory data that were collected at study enrollment were used for the analysis.

Univariate survival analysis was performed with Cox proportion hazard model (dependent variables: months from the beginning of HD treatment to death) with adjustment for patient age and gender. Significant variables in univariate analysis were tested in a multivariate Cox models using the backward stepwise method.

**Results:** During the follow-up period, 577 patients died, 44 were transplanted, 69 were lost from the follow-up and 1463 remained on regular HD. By univariate Cox proportional hazard model, the following variables were selected as potential predictors of death: age, gender, underlying kidney disease (glomerulonephritis, diabetic nephropathy, Balkan nephropathy, polycystic kidney disease) duration of HD treatment, hours of HD/week, type of HD, interdialytic weight gain, systolic blood pressure, Kt/V, hemoglobin (Hb), s-calcium (Ca), s-phosphate (PO4), iPTH, use of oral iron, phosphate binders, vitamin D, ESA dose and number of transfusions. Combining these variables in multivariate Cox proportional hazard model the significant independent predictors of death were selected (Table 1). When target values of Kt/V, Hb, Ca, PO4, iPTH were included in multivariate Cox model, target values for Kt/V and Hb were found to be the only significant predictors of death (Table 1).

**Conclusion:** Age, gender, duration of HD treatment, hours of HD/week, number of transfusion per year and diabetic nephropathy were selected as significant independent predictors of HD patient mortality. The relative risk of mortality was associated with being outside the guidelines targets for Kt/V and Hb, but not outside the target ranges for Ca, PO4 and PTH.

**MP515**

**EFFECT OF HEMODIALYSIS MODALITY ON PARAMETERS OF ADEQUACY AND ALL-CAUSE MORTALITY – 24 MONTHS FOLLOW UP**

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**Introduction and Aims:** Retrospective studies showed that HDF was associated with a risk reduction of mortality over standard hemodialysis (HD) in patients with end-stage renal disease. Recently, a few prospective randomized clinical trials (except the “ESHOL study”), found no advantage in survival with HDF vs. high-flux HD (HFHD)

<table>
<thead>
<tr>
<th>Variable</th>
<th>group I LF-dialysis</th>
<th>group II HF-dialysis</th>
<th>group III HDF</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>69</td>
<td>64</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Male g. (%)</td>
<td>50.7%</td>
<td>68.8%</td>
<td>53.8%</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Age (y.)</td>
<td>67±10.8</td>
<td>59±11.8</td>
<td>57±10.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Time on HD (m.)</td>
<td>44±36.5</td>
<td>96±67.2</td>
<td>117±39.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HgB(g/dL)</td>
<td>10±0.7</td>
<td>10±1.2</td>
<td>10±1.2</td>
<td>0.001</td>
</tr>
<tr>
<td>ESA use (%)</td>
<td>97.1%</td>
<td>76.6%</td>
<td>80.8%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ESA weekly (L.U.)</td>
<td>5194±3190</td>
<td>5700±9400</td>
<td>7071±5800</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>ERI(U/kg/week)</td>
<td>8.2±5.0</td>
<td>9.0±8.2</td>
<td>10.4±10.0</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>BMI(kg/m2)</td>
<td>24±4.6</td>
<td>24±4.0</td>
<td>23±4.8</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>s.albumin(g/L)</td>
<td>37±12.7</td>
<td>38±12.8</td>
<td>38±3.3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>CRP(mg/L)</td>
<td>10±11.4</td>
<td>9.0±9.0</td>
<td>9.0±9.6</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>iPTH(pg/ml)</td>
<td>345±356</td>
<td>554±638</td>
<td>451±402</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Ca (mmol/L)</td>
<td>2.29±0.19</td>
<td>2.55±0.15</td>
<td>2.31±0.12</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>P (mmol/L)</td>
<td>1.48±0.36</td>
<td>1.71±0.44</td>
<td>1.64±0.41</td>
<td>0.003</td>
</tr>
<tr>
<td>P binders use (%)</td>
<td>(84.1%)</td>
<td>(82.8%)</td>
<td>(92.3%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Vit. D use (%)</td>
<td>(47.8%)</td>
<td>(51.6%)</td>
<td>(53.8%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Kt/V value</td>
<td>1.32±0.23</td>
<td>1.25±0.24</td>
<td>1.50±0.29</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
and low-flux HD (LFHD). The aim of study was to compare the parameters of anemia, malnutrition, inflammation, mineral metabolism and survival rate, depending on the type of hemodialysis treatment.

**Methods:** A total of 159 hemodialysis patients were divided into 3 groups according to the type of hemodialysis treatment: group I - low flux membranes, group II - high flux membranes, and group III - hemodiafiltration. We analyzed one-year average biochemical parameters, and 24 months patient’s survival.

**Results:** Patients on HDF were significantly younger and they had longer dialysis vintage as compared with patients on LFHD and HFHD. Compared to patients on LFHD, patients on HDF and HFHD had significantly higher hemoglobin value despite the less frequent ESA use (Table 1). Patient on HDF had significantly higher Kt/V than patients on LFHD and HFHD without difference between two later groups. According to Kaplan-Meier survival analysis patients on HDF and HFHD had significantly better two-year survival than patients on LFHD (Log-rank test P= 0.0299) (Figure 1). Cox proportional hazards model confirmed that HDF caused a significant, 56 % RR reduction of mortality compared to LFHD (HR 0.44; 95% CI 0.22 - 0.905; P=0.026), and HDF caused a 58 % RR reduction of mortality compared to LF dialysis (HR 0.42; 95% CI 0.15 to 0.202; P=0.015).

**Conclusions:** This study demonstrates 2-year survival benefit with use of HFHD and HDF compared with LFHD. There was no difference in survival between HFHD and HDF groups. Dialysis adequacy is not sufficient explanation for this HDF/HFHD benefit.

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**MP516 DIALYSIS ADEQUACY AND FACTORS RELATED WITH PATIENTS WELL BEING**

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**Introduction and Aims:** A global assessment of dialysis adequacy includes not only achieving target Kt/V or Urea Reduction but also achieving good control of metabolic acidosis, bone metabolism, anaemia, fluid balance and nutritional status. We performed a regional survey of our practice and collected data which are directly related to dialysis adequacy.

**Methods:** 606 patient data collected from 12 hemodialysis units in June 2013. Majority of the patients have 12 hours per week hemodialysis. Pre dialysis samples collected to check serum albumin, bicarbonates, C reactive protein (CRP) and phosphate levels on first session in beginning week of June 2013. Data recorded on pre generated proforma which was distributed among centres to record number of variables for hemodialysis adequacy assessment. Data for dialysis access were also recorded.

**Results:** Average pre dialysis serum bicarbonate levels from all centres were between 22-29 mmol/l in 74%. Serum Albumin above 35 g/l found in in 59% while 44.75% had serum phosphate levels above 1.7 mmol/l (Table 1) Serum CRP 15 mg/l in 40.2% of patients (table 2). It’s also noted that higher levels of CRP were related to patient dialysed via vascular catheter 23.6±5.8 (87 cases), 15.5 ± 2.3(12 cases) with graft and 15.5 ± 2.3(343 cases) with arterio venous fistula (AVF). We were unable to recorded data from one of the centres for CRP.

**Conclusions:** Above results is the average from twelve dialysis units. Some centres has better control of the studied variable than others. This is possibly due to use of hemodiafiltration modality in some centres and difference in vascular access. Overall it’s found that there is a scope for better control of serum phosphate, serum bicarbonate across centres to improve patient’s morbidity and mortality. Minimizing dialysis central catheters has been proven in studies to reduce infection rates hence assuming less inflammation and achieving better control of CRP. Effect of more frequent daily dialysis on adequacy will be evaluated in our home hemodialysis population later.

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**MP517 CLINICAL ASPECTS OF VITAMIN D PATHWAY GENE POLYMORPHISM IN HEMODIALYSIS WOMEN AND MEN**

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**Introduction and Aims:** Vitamin D metabolism is associated with life-threatening diseases with gender-dependent prevalence like myocardial infarction (MI) or bone mineral disorders. Our aim was to evaluate a frequency distribution of vitamin D pathway gene polymorphisms in hemodialysis (HD) women and men in relation to prevalence of coronary artery disease (CAD) and severity of secondary hyperparathyroidism (sHPT).

**Methods:** HD women (n=431, age 63.4±14.8 yrs) and men (n=625, age 61.3±14.8 yrs) as well as control women (n=163, age 49.5±12.7 yrs) and men (n=150, age 48.9±12.4 yrs) were enrolled into the study. Polymorphisms of genes encoding vitamin D binding
protein (VDRP; rs2298849 [genotyped by High Resolution Mel analysis - HRM]), rs7041 (Restriction Fragment Length Polymorphism analysis - RFLP, restriction enzyme - HaeIII), rs1515563 (HRM), vitamin D receptor (VDR; rs222870) (RFLP, FokI), rs1544410 (RFLP, BsmI), and retinoid A receptor A (RXRA; rs106776909 (HRM), rs10881578 (HRM), rs7497599 (RFLP, BstXI) were genotyping in all study subjects. Frequencies of the respective genotypes were compared between groups with and without age matching. Clinical data [prevalence of CAD, MI, parathyroidectomy (PTX)], and treatment of cinacalcet (TC), 955 patients reviewed] and laboratory results [serum Ca, P, ALP, and PTH, 827 mean values of 2-4 results for each parameter; plasma 25(OH)D, 207 results] were compared in HD women and men bearing different polymorphic variants of the analyzed genotypes. In patients who underwent PTX or TC, laboratory data shown before these treatment commencements were taken into analysis.

Results: HD women and men did not differ in a frequency distribution of vitamin D pathway gene polymorphisms, also if age pair matched subjects were compared which also did not differ in RRT vintage and main causes of ESRD (P trend<0.05). Plasma vitamin D levels were lower in HD women than those in men (13.0±5.2 vs 15.5±4.6 ng/mL; P<0.00004). HD women compared to healthy women differed in a frequency distribution of rs10776909 independently on whether age matched or not (P trend<0.02). Prevalence of MI was higher in HD men bearing GG compared HD men compared to healthy men did not differ in the frequency distribution of vitamin D pathway gene polymorphisms independently on whether age matched or not (P trend>0.05). Prevalence of MI was higher in HD men bearing GG compared HD men bearing AA+AG rs10881578 (OR 1.93, 95%CI 1.01-3.59, P<0.047). Lower 25(OH)D plasma levels were in CT+TT compared to CC rs2228750 carriers (P=0.040). TT female carriers compared to GG+GT rs7041 carriers showed higher P level (P=0.008), AA rs10881578 women had higher prevalence of PTH≥500 pg/mL (P=0.028) and higher ALP activity (P=0.020) than AG+GG women. HD men compared to healthy men did not differ in the frequency distribution of vitamin D pathway gene polymorphisms independently on whether age matched or not (P trend>0.05). Prevalence of MI was higher in HD men bearing GG compared HD men bearing AA+AG rs10881578 (OR 1.93, 95%CI 1.01-3.59, P<0.047). Lower 25(OH)D plasma levels were in AA compared to GG+AG rs1544410 carriers (P=0.035). Higher Ca levels were shown in CC compared to TT rs2228750 (P=0.036), TT compared to CC rs10776909 (P=0.010), and GG compared to AA rs10881578 (P=0.042) HD men.

Conclusions: In HD patients there are associations between vitamin D pathway gene polymorphisms, CAD/MI prevalence, mineral disorders, and severity of sHPT. Gender related factors may be important in expression of associations between vitamin D pathway polymorphic variants and mentioned abnormalities.

**INTERLEUKIN-31 IS ASSOCIATED WITH UREMIC PRURITUS IN HEMODIALYSIS PATIENTS**

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Introduction and Aims: Interleukin-31 is a novel cytokine associated with many itching skin diseases and has been found to induce severe pruritus and dermatitis in transgenic mice. However, the role of interleukin-31 in uremic pruritus remains unknown. This study aimed to examine the relationship between uremic pruritus and serum interleukin-31 levels in uremia patients.

Methods: Patients with maintenance hemodialysis in the hemodialysis unit in a referral medical center were recruited. Serum interleukin-31 levels were determined by enzyme-linked immunosorbent assay methodology. The intensity of uremic pruritus was measured using the visual analog scale (VAS) scores. The various characteristics of pruritus were assessed by a detailed interview questionnaire based on the short form of the McGill Pain Questionnaire. Patient demographic and clinical characteristics, laboratory parameters, as well as dialysis adequacy (as assessed by Kt/V), were recorded. Multivariate linear regression was used to assess the association between serum interleukin-31 and pruritus intensity. The generalized additive models were applied to detect the nonlinear effects and the dose-response relationship between serum interleukin-31 and pruritus intensity. The generalized additive models were applied to detect the nonlinear effects and the dose-response relationship between serum interleukin-31 and pruritus intensity.

**Table 1. Multivariate linear regression analysis of the predictors for VAS scores of pruritus intensity**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Parameter estimate</th>
<th>Standard error</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>rs10881578</td>
<td>0.04</td>
<td>0.02</td>
<td>0.047</td>
</tr>
<tr>
<td>rs1544410</td>
<td>0.03</td>
<td>0.01</td>
<td>0.008</td>
</tr>
<tr>
<td>rs10776909</td>
<td>0.02</td>
<td>0.01</td>
<td>0.020</td>
</tr>
</tbody>
</table>

Results: A total of 178 patients completed this study. Among the study participants, 34.8% suffered from uremic pruritus. The patients with uremic pruritus had higher serum interleukin-31 levels than those without pruritus symptoms (31.7±51.0 vs 11.8±17.2; P<0.04). Higher serum levels of interleukin-31 were positively correlated with higher VAS scores of pruritus intensity (r=0.15, P=0.02). Furthermore, a multivariate regression analysis showed that higher serum levels of interleukin-31, C-reactive protein, and alamine transaminase, as well as lower Kt/V, were independent predictors for higher pruritus intensity after adjusting for potential confounding factors (Table 1). A positive dose-response relationship between serum levels of interleukin-31 and VAS scores of pruritus intensity was also found (Figure 1).

Conclusions: Interleukin-31 may play an important role in hemodialysis patients with uremic pruritus. Whether a causal relationship exists between interleukin-31 and uremic pruritus deserves further study.

**LOWER SERUM HIGH-DENSITY LIPOPROTEIN-CHOLESTEROL LEVEL IS ASSOCIATED WITH THE NEW-ONSET OF PERIPHERAL ARTERIAL DISEASE IN NON-DIABETIC HEMODIALYSIS PATIENTS**

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Introduction and Aims: Some studies have demonstrated inverse correlation between the serum level of high-density lipoprotein-cholesterol (shDL-C) and the risk of new-onset peripheral artery disease (PAD) in general population. However, little is known regarding this relationship in hemodialysis (HD) patients. The aim of this study was to evaluate the association between shDL-C with the new-onset of PAD in non-diabetic HD patients.

Methods: We prospectively observed consecutive 132 non-diabetic HD patients diagnosed without PAD at baseline in a single center in Japan for five years. Diagnosis of PAD was defined as the significant lower limb arterial stenosis (60% and more) using ultrasonography at baseline and five years later. We set new-onset of PAD diagnosed by ultrasonography as the main outcome measure in this investigation. Main exposure to be tested was shDL-C at baseline: shDL-C greater or equal 40mg/dL (the Japanese guideline cut-off level) was defined as reference. Logistic regression analysis was employed to estimate the odds ratio (OR) and 95% confidence interval (CI) of newly PAD onset by shDL-C at baseline. Multivariate analyses were adjusted for age, gender, smoking, coronary artery disease, and statin use.

Results: The number of new-onset PAD were 12/34 cases (35.3%) and 6/77 cases (7.8%) in non-diabetic HD patients. Multivariate logistic regression analyses revealed that lower shDL-C was significantly related with greater odds of new-onset PAD (OR 2.1, 95%CI 1.1 to 4.0; P<0.05).

Conclusions: These results suggest that lower shDL-C is associated with new-onset PAD in non-diabetic HD patients.
explore the relationship between SG and mortality in a cohort of prevalent HD patients treated in our Department in a five year follow-up analysis.

**Methods:** We studied a cohort of 258 prevalent HD patients (mean age at beginning of HD 49.69±15.59 years, mean HD vintage 59±54.72±15.7 months, diabetes 17%) receiving thrice-weekly HD treatment. We calculated the mean plasma sodium by available pre-HD plasma sodium concentrations assessed at baseline and at monthly intervals during follow-up. All the patients were dialyzed with a standard dialysis sodium of 140 mEq/L. Association with all-cause mortality were explored initially between two groups of patients with negative and positive SG, then between three groups of patients stratified by SG with patients with SG >+2 mEq/L, SG between +2 mEq/L to -2 mEq/L and patients with SG < -2 mEq/L. Patients >+2 mEq/L were younger than the other two groups, ultrafiltration and interdialytic weight gain significantly reduced from positive to negative gradient, left ventricular mass index was significantly higher in patient with SG >+2 mEq/L (59.8±16.43/m2) in than in patients with SG between +2 mEq/L to -2 mEq/L (15.9±9.62/m2) and patients with SG < -2 mEq/L (15.9±9.62/m2). Groups showed lower mortality risk in patients with SG between +2 mEq/L to -2 mEq/L (log rank; p=0.002), while higher mortality was observed in patients both SG > +2 mEq/L and SG < -2 mEq/L (HR 1.875 (95% CI 1.34-7.32) and 0.000) for patients with SG >+2 mEq/L compared to patients with SG between +2 mEq/L to -2 mEq/L. We did not find significant difference in HR (1.4; 95% CI 0.83-1.22; p=0.86) between patients with SG >+2 mEq/L vs 2 mEq/L to -2 mEq/L.

**Conclusions:** This study showed that a sodium gradient between +2 mEq/L to -2 mEq/L was associated with lower all-cause mortality HD patients, but the prospective studies with larger numbers of patients are needed to apply in clinical practice.

**References:**

1. Kwak Background, University of Medicine, Gangneung, Republic of Korea.
2. Kangdong Sacred Heart Hospital, Hallym University, Seoul, Republic of Korea.
3. Yongin Severance Hospital, Yonsei University, Yongin, Republic of Korea.
4. Bundang CHA Hospital, CHA University, Seongnam, Republic of Korea.
5. Gangnam Severance Hospital, Yonsei University, Seoul, Republic of Korea.
**Methods:** the Biological Effects of Ionizing Radiation (BEIR) VII report. The aims of this study estimated the projected cancer risk, by estimating the Effective and Organ Doses (ED, OD) and applying organ-specific cancer incidence or mortality data, as summarized in the Biological Effects of Ionizing Radiation (BEIR) VII report. The aims of this retrospective study were to quantify the cumulative ED and OD to relevant organs and to assess radiation risks of cancer in hemodialysis patients (HDp).

**Methods:** 159 HDp with a follow-up ≥1 year and without previous neoplasia were enrolled. Cumulative ED and OD were estimated from the Radiology Information System and Picture Archiving and Communication System of our Radiology Department. Radiation risk, expressed as Risk of Exposure-Induced Death (REID %) was estimated according to the BEIR VII model.

**Results:** 159 HDp (101 males, mean age 65.3 years) were followed for a median of 2.7 years (486 patient-years). The median and mean total CED were 35.9 and 84.2 mSv, respectively; the median and mean annual CED were 12.1 and 28.1 mSv, respectively. 23 (15%) and 16 (10%) HDp received a total CED of 100-200 and >200 mSv, respectively. The mean cumulative OD were 102, 100, 99, 77 and 58 mGy for lung, stomach, liver, colon and bone marrow, respectively. The computer tomography contributed to 94% for lung, 99% for breast, minimum 81% for gynecological reasons. The cancer risk shows a strong, good and reasonable evidence for doses >100 mSv, 50-100 mSv and <50 mSv.

**Conclusions:** Radiation contributes significantly to cancer risk in hemodialysis patients. The radiation risk, expressed as REID %, is not negligible (about 1% in a few years). This should be of concern for nephrologists since HDp are living longer and have several concomitant risks factor for future cancer, including immunosuppression status for subjects who will undergo kidney transplantation.

**Introduction and Aims:** Advances in medical imaging have been associated with increased Ionizing Radiation Exposure (IRE). The relationship between IRE and cancer risk shows a strong, good and reasonable evidence for doses >100 mSv, 50-100 mSv and 10-50 mSv, respectively. Retrospective studies confirmed an excess risk of cancer in adults who underwent computer tomography in childhood, while other Authors estimated the projected cancer risk, by estimating the Effective and Organ Doses (ED, OD) and applying organ-specific cancer incidence or mortality data, as summarized in the Biological Effects of Ionizing Radiation (BEIR) VII report. The aims of this retrospective study were to quantify the cumulative ED and OD to relevant organs and to assess radiation risks of cancer in hemodialysis patients (HDp). A total of 92 hemodialysis patients underwent a 48-hour brachial and aortic ambulatory blood pressure monitoring (ABPM) with the use of the newly commercially available Mobil-O-Graph device (IEM, Stolberg, Germany). ABPM included a novel 4-hour hemodialysis session and the subsequent 44-hour interdialytic interval. Mobil-O-Graph is a novel validated brachial cuff-based automatic oscillometric device, which additionally records in ambulatory conditions pulse waveforms at brachial and aortic level and assesses wave reflection and arterial stiffness (Pulse Wave Velocity, PWV) via mathematical transformation.

**Results:** In 40 male HDP, 49.8 (45.3-54.2) years old, with sHPT (PTH>300 pg/ml), the 35 patients who completed the study cinacalcet treatment significantly decreased arterial stiffness during the interdialytic period over a 48-hour period in chronic hemodialysis patients. The aim of this study was to investigate potential variations in wave reflection and arterial stiffness parameters during the intra- and inter-dialytic periods over a 48-hour period in chronic hemodialysis patients.

**Methods:** A total of 92 hemodialysis patients underwent a 48-hour brachial and aortic ambulatory blood pressure monitoring (ABPM) with the use of the newly commercially available Mobil-O-Graph device (IEM, Stolberg, Germany). ABPM included a novel 4-hour hemodialysis session and the subsequent 44-hour interdialytic interval. Mobil-O-Graph is a novel validated brachial cuff-based automatic oscillometric device, which additionally records in ambulatory conditions pulse waveforms at brachial and aortic level and assesses wave reflection and arterial stiffness (Pulse Wave Velocity, PWV) via mathematical transformation.

**Results:** In hemodialysis-on day (Day-1) mean heart rate-adjusted augmentation index (AixT(75)) was significantly lower during the intra-dialytic period than during the out-of-dialysis period (25.0±9.1 vs 27.0±7.8 %, P=0.001). In contrast, PWV did not significantly differ between the intra-dialytic and out-of-dialysis intervals of the hemodialysis-on day (9.29±2.4 vs 9.27±2.5 m/sec, P=0.679). Both AixT(75) and PWV were significantly elevated during the 24-hour period of the hemodialysis-off day (Day 2) as compared to the out-of-dialysis period of the hemodialysis-on day (28±6.4 vs 27.0±7.8 %, P<0.05 and 9.40±2.5 vs 9.27±2.5 m/sec, P<0.001, for AixT(75) and PWV respectively).

**Conclusions:** This study shows a gradual interdialytic increase in arterial wave reflections along with a slight and potentially BP-dependent elevation in arterial stiffness during the interdialytic period in hemodialysis patients.
serum free testosterone concentration and changes of serum PTH, calcium and phosphate concentration and cinacalcet dose, respectively.

Conclusions: Treatment with cinacalcet decreases serum free testosterone concentration in male hemodialyzed patients with chronic kidney disease and secondary hyperparathyroidism.

**MP528**  
**FIREFLIES STUDY: A FIRST THREE MONTH FOLLOW UP**

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Introduction and Aims: Free Light Chain immunoglobulins (FLCs) accumulate in the sera of patients with chronic renal failure as result of a reduced or abolished clearance and may be considered as members of uremic toxins family. SUPRA hemodiafiltration therapy, combining a very high performing membrane, in term of extraction capability, and the adsorption of ultrafiltrate on a resin cartridge, could reduce levels of FLCs in ESRD patients. Aim of the multicenter FIREFLIES study is the evaluation of SUPRA therapy on long-term reduction of FLCs levels. Moreover is expected an improvement, due to FLCs reduction, on the immunological and inflammatory parameters.

Methods: Within a cohort of 147 patients (selected for pre-screening) and on the basis of exclusions criteria of this protocol (i.e. active inflammatory and immunological diseases determine exclusion) were enrolled 27 patients (16M, 11F) with a mean age of 70±12 years, in 5 Dialysis centres. A wash out period of 2 weeks in Bicarbonate-Dialysis (BD) was followed by a six month of SUPRA treatment (4 hours, three times per week). Plasma Samples were collected at beginning of the dialysis session after three months and at the end of the study (Fig.1). After three months pre dialysis levels of FLCs k, FLCs l and β2M were determined by nephelometric assays (FERELITE; The Binding Site, Birmingham, UK); TGF β1 and CFD were evaluated by Solid Phase Sandwich ELISA (Quantikine ELISA kit, R&D System, Minneapolis, MN, USA).

Results: Here we present a preliminary and partial results on FLCs level in the twenty-seven patients that have completed the first three month of the study. The results shown a statistically significant reduction for FLCs k, FLCs l, β2M, TGFβ1-1 and CFD were evaluated by Solid Phase Sandwich ELISA (Quantikine ELISA kit, R&D System, Minneapolis, MN, USA).

Conclusions: The preliminary results of FIREFLIES study shown that SUPRA therapy is able to reduce the FLCs serum concentration as well as Complement Factor D (CFD) with the respect to the basal value (Table 1). Another marker, such as FLCs k/λ ratio, not shows significantly variation between T0 and T3 (1.90±0.14 vs 1.80±0.12) confirming that the SUPRA technique is able to remove both FLCs k and λ FLCs.

**MP550**  
**PREDICTORS OF HEALTH RELATED QUALITY OF LIFE PERCEIVED BY END STAGE RENAL DISEASE PATIENTS UNDER ONLINE HEMODIALFILTRATION**

Alexandra Moura1, José Madureira2, Pablo Aljia3, João Carlos Fernandes3, José Gerardo Oliveira4, Martin Lopez5, Madalena Figueiras5, Leonilde Amado6, Vasco Miranda7, Maria Sameiro-Faria8, Margarida Veira9, Alice Santos-Silva10 and Eliso Costa11

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Introduction and Aims: Patients’ perception of health quality of life (HRQOL) is a consistent and powerful predictor that affects the outcome of end-stage renal disease (ESRD) patients under dialysis. This study aims to identify factors that could predict the HRQOL among ESRD patients under online-hemodiafiltration (OL-HDF).

Methods: We evaluated 322 ESRD patients under OL-HDF (59.63% males; 64.9 ± 14.3 years old) from five dialysis units in the north of Portugal. Socio-demographic data, comorbidities, hematological data, iron status, dialysis adequacy, nutritional and inflammatory markers were collected from patients records. Moreover, patient’s reported HRQOL score, by using the Kidney Disease Quality of Life-Short Form (KDQOL-SF) was assessed.

Results: Analyzing the results according to quartiles of total score of HRQOL, significant differences were found. Patients with higher total score of HRQOL showed a significant increased age, mean cell volume (MCV), mean cell hemoglobin concentration (MCHC), urea and creatinine serum levels, and a decrease in RW. A trend (p<0.1) for higher hemoglobin concentration was found in patients with higher total score of HRQOL. Moreover, the highest total score of HRQOL was associated with a higher proportion of males, and with a lower proportion of diabetic patients and central venous catheter use. For multiple linear regression analysis, we included variables presenting a p value less than 0.1 in the ANOVA analysis. The model included the following independent variables: age, gender, diabetes, body mass index, hemoglobin concentration, MCV, MCHC, RDW and serum levels of potassium, creatinine, urea and total proteins. Our results showed three significant predictors of HRQOL: RDW, gender (male) and diabetes. Linear regression equation can be written as: HRQOL = 62.66 - 2.32 X RDW + 6.37 X gender (male) - 6.46 X diabetes. The multiple linear regression analysis, we included variables presenting a p value less than 0.1 in the ANOVA analysis. The model included the following independent variables: age, gender, diabetes, body mass index, hemoglobin concentration, MCV, MCHC, RDW and serum levels of potassium, creatinine, urea and total proteins. Our results showed three significant predictors of HRQOL: RDW, gender (male) and diabetes. Linear regression equation can be written as: HRQOL = 62.66 - 2.32 X RDW + 6.37 X gender (male) - 6.46 X diabetes.

Conclusions: In conclusion, our results showed that associated morbidities, specially diabetes, gender and erythropoietic disturbances are independent predictors of HRQOL in patients under OL-HDF.

**MP551**  
**ASSOCIATION OF SEROTONIN 1A RECEPTOR POLYMORPHISM WITH HEALTH RELATED QUALITY OF LIFE IN THE KOREAN HEMODIALYSIS PATIENTS**

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Introduction and Aims: Hemodialysis patients suffer psychological distress and have reduced quality of life (QoL) due to chronically ongoing physical health problems. Genetic polymorphisms associated with emotional distress may contribute to the reduced level of QoL in this patient group. The aim of study was to assess the relationship of genetic polymorphisms and other clinical characteristics with health-related QoL in Korean hemodialysis patients.

Methods: One hundred and ninety clinically stable patients from 6 hemodialysis centers participated in this study. Thirty-six item Short-Form Health Survey (SF-36) and Hospital Anxiety and Depression Scale (HADS) were used to assess health-related QoL and psychological distress, respectively. Sociodemographic factors, hemodialysis-related clinical factors, and serotonin 1A receptor, BDNF, glucocorticoid receptor genetic polymorphisms were assessed.

Results: In bivariate correlation analyses, mental and physical QoL scores showed significant correlations with age, total dialysis duration, the number of comorbid medical illnesses, serum calcium level and cholesterol level, C reactive protein level, and severity of anxiety and depression. In the final linear discriminant analyses, mental QoL level was significantly associated with age, anxiety, depression, and serotonin 1A receptor gene type. Physical QoL level was significantly associated with age, depression, total dialysis duration, and serotonin 1A receptor gene type.

Conclusions: All controlling factors, as well as the serotonin 1A receptor polymorphism as well as age and depression showed significant relationship with mental and physical QoL. Serotonin activity may have a modulating effect on QoL in hemodialysis patients.

Introduction and Aims: Mildly depressed LVEF is independently associated with cognitive impairment. This study was conducted to ascertain the cutoff level of LVEF which best predicted cognitive impairment. Also, linear discriminant analysis was performed to determine the association between copeptin and its stimuli pre- and during HD and these analyses were corrected for age, sex, and diabetes.

Results: Patients were 63±15.6 years old and 65% were male. The median dialysis vintage was 1.6 years (IQR 0.7–4.0). Twenty-five patients had diabetes mellitus and 86% had hypertension. Median pre-HD copeptin levels were 141.5 pmol/L (IQR 90.1–244.8 pmol/L). Pre-HD plasma sodium levels, plasma NT-proBNP levels and blood pressure were not significantly associated with higher plasma copeptin levels pre-HD. During HD, copeptin levels rose significantly to 164.0 pmol/L (IQR 98.3–292.0 pmol/L) at the end of dialysis (p<0.01). Greater decreases in blood volume and MAP were associated with a greater increase in copeptin levels (β=0.06; p=0.01 and β=0.05; p=0.04, respectively), whereas there was no significant association between the change in plasma sodium levels and the change in copeptin concentration during HD (β=0.01; p=0.97).

Conclusions: Plasma copeptin levels are elevated predialysis and increase further during HD. Volume stimuli, i.e. decreases in blood pressure and blood volume, rather than the change in plasma sodium level as the main determinant of an osmotic stimulus, are significantly associated with the rise in plasma copeptin levels during HD.

Cognitive impairment is a common finding in end-stage renal disease patients on chronic hemodialysis, but data on the associated factors are still scanty.

Methods: We enrolled 72 patients admitted to the hemodialysis Unit of the Catholic University, Rome. Cognitive performance was evaluated using the Mini Mental State Examination (MMSE); a cutoff of 24 was used to diagnose cognitive impairment. Left ventricular ejection fraction (LVEF) was assessed by echocardiography. Multivariable linear and logistic regressions were adopted to assess the adjusted association between cognitive performance and LVEF. Also, linear discriminant analysis was performed to ascertain the cutoff level of LVEF which best predicted cognitive impairment.

Results: Cognitive impairment was found in 37 (51%) subjects. Subjects with a MMSE score <24, as compared with other participants, were significantly older and more frequently disabled in the IADLs also; they showed a higher Charlson comorbidity score index and a more prevalent diagnosis of depression. In addition, they showed lower creatinine and albumin serum levels, and higher IL-6 levels, as compared with patients without cognitive impairment. According to linear regression, LVEF was associated with MMSE in the unadjusted model (B=12; 95% CI=-5.0–29; P=0.19), after adjusting for age and sex (B=0.09; 95% CI=-0.15; P=0.94), as well as in the multivariable model (B=0.06; 95% CI=-0.12; P=0.40), adjusting for those variables which showed significant difference in univariate analyses (i.e. education level, Charlson index, disability in the IADLs, diagnosis of diabetes, presence of depression, dialytic blood flow, and interleukin 6, albumin, and creatinine levels). When the same linear model was analyzed considering WMSI instead of LVEF, MMSE was not associated with this score (B=25; 95% CI= -2.44–2.94, P=0.83).

In multivariable logistic regression model, after adjusting for those variable which showed significant differences in univariate analyses, LVEF was inversely associated with cognitive impairment (OR=0.87; 95% CI= 0.78–0.96; P=0.022). When the same logistic model was analyzed considering WMSI instead of LVEF, cognitive impairment was not associated with this score (OR=1.58; 95% CI= 0.4–5.04, P=0.810). According to linear discriminant analysis, LVEF ≤ 51% best predicted a MMSE<24 (P=0.002). A LVEF ≤ 51% was detected in 13/72 (18%) of patients.

Conclusions: Cognitive impairment is a common finding in hemodialysis patients. Even mildly depressed LVEF is independently associated with cognitive impairment. This association and its potential therapeutic implications should be assessed in dedicated studies.

Abstracts
only few studies reporting the relation between 25OHD level and physical performance function in maintenance hemodialysis (MHD) population.

Methods: This ongoing study has recruited ambulatory MHD patients aged ≥20 years old with MHD ≥26 months, without hospitalization history for the previous 3 months. Study participants performed various performance function tests the day after hemodialysis treatment, such as short physical performance battery (SPPB), sit to stand test-30(ST30), the number of sit to stand cycles completed for 30 seconds), 6 minute walk test (6MWT, distance in meters measured for 6 minutes) and timed up and go test (TUG, seconds). Grip strength (GS, kg) was measured three times in dominant hand with Jamar Hydraulic Hand Dynamometer and the best score was selected for data analysis. Demographic and laboratory data were obtained from a review of medical records. 25OHD level was measured twice at 3-month interval and averaged for analysis.

Results: Sixty three patients evaluated were 57.5±11.6 years of age (mean±SD) on MHD for 5.2±5.4 years; 49.2% were male. MHD level was 12.4±7.8 ng/mL, and 56 participants (88.9%) were in a state of vitamin D deficiency (defined as <20ng/mL). According to serum 25OHD levels, study participants were classified into severely deficiency group (defined as ≤10ng/mL, n=25) and >10 ng/mL group (n=38). Severely deficient patients were more likely to have diabetes (7.0 vs. 39.5%, P<0.05) and higher Charlson-Comorbidity Index (CCI) score (6.3±2.1 vs. 5.0±2.1, P<0.05). Severely 25OHD deficient patients also showed worse physical function than the other group as follows; lower SPPB scores (10.5±1.2 vs. 11.4±1.1; P<0.01), lower ST30 (16.2±4.7 vs. 19.2±5.7, P<0.05), shorter 6MWT distance (416.8±104.5 vs. 489.4±79.1, P<0.01), lower GS (22.9±4.9 vs. 28±4.7; P<0.01). In multivariate analysis, SPPB, TUG and GS showed significant associations (odds ratio [95% CI]: 193 [1.08-3.64], 0.52 [0.33-0.83] and 1.20 [1.03-1.42], respectively) with 25OHD level above 10 ng/mL after adjustment for age, gender, diabetes, CCI, levels of hemoglobin and albumin.

Conclusions: Severe vitamin D deficiency is significantly associated with poorer physical performance function and less skeletal muscle strength. Randomized controlled trial with vitamin D replacement will be needed to confirm clinical implications of 25-hydroxyvitamin D to improve physical function and strength in this population.

Introduction and Aims: Over the last 5 years, we diagnosed cutaneous Mycobacterium chelonae infection in 2 hemodialyzed (HD) patients. Both presented with cutaneous erythematous nodules on the arteriosclerotic fistula (AVF) arm, slowly evolving towards soft-tissue involvement, abscesses and fistulization, documented by Magnetic Resonance Imaging and requiring multiple surgeries. The diagnosis was suggested by nodule biopsy showing granulomatous inflammation in one case (biopsy non-specific in the other) and made by culture. The infection was cured by antibiotics.

Methods: We searched the literature (from 1966) and surveyed all Belgian HD units (between 2001 and 2011) for similar cases.

such score over time, BMI was the one variable independently associated with reduction. 

Conclusions: Fatigue is stable over time in patients on chronic hemodialysis

SEVELAMER POSSIBLY INFLUENCES NEUTROPHIL FUNCTION IN DIALYSIS PATIENTS VIA ENDOTOXIN BINDING

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Introduction and Aims: Bacterial infection and sepsis are among the most common complications in patients on dialysis. The aim of this study was to investigate the impact of sevelamer on endothelium levels and on neutrophil function in patients undergoing haemodialysis (HD) or haemofiltration (HDF).

Methods: Neutrophil function was determined by coincubating whole blood with FITC-labelled E.coli (Phagotest, Glycotope, Germany). Samples were analysed by flow cytometry. Endotoxin was measured by an adapted LAL assay (Kinetic Chromogenic LAL, Charles River USA). Endotoxin binding proteins such as lipopolysaccharide binding protein (LBP) and sCD14 were measured by ELISA (Human LBP, Human sCD14, Hycult biotech, Netherlands).

Results: Fifteen dialysis patients on sevelamer and 14 dialysis patients without sevelamer were studied and compared with healthy controls (n=19). Vascular access type was an arteriovenous fistula in 12, a graft in 8 and a central venous catheter in 9 patients. Phagocytic capacity was significantly decreased by 40.3% (p<0.001) in patients not taking sevelamer compared to sevelamer treated patients, who on the other hand showed equal phagocytic capacity compared to healthy controls. Endotoxin was only detected in two patients not on sevelamer. sCD14 was increased to 3.74 mg/ml (p<0.001) in patients on sevelamer and 4.23 mg/ml (p<0.001) in patients not on sevelamer compared to controls (1.06 mg/ml). LBP was not different between all groups. Vascular access type had no influence on phagocytosis, sCD14 or LBP.

Conclusions: These preliminary results show that patients receiving sevelamer have a better neutrophil phagocytic capacity, no detectable endotoxin in serum and lower sCD14 levels. Our data suggest that sevelamer has positive effects on innate immune function due to its enteric endotoxin binding capacity. Other influencing factors need to be assessed to better characterise the role of sevelamer in innate immune function.

EFFICACY AND SAFETY OF LOW-DOSE FEBUXOSTAT IN CHRONIC HEMODIALYSIS PATIENTS WITH HYPERURICEMIA

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Introduction and Aims: Hyperuricemia is strongly associated with the development of chronic kidney disease (CKD). Fubuxostat can carefully administrate to mild to moderate renal dysfuncion with hyperuricemia , and decrease serum uric acid. However, no data are available regarding the effect of Fubuxostat in patients with end stage renal disease (ESRD). Therefore, the primary aim of this study is to examine the efficacy and safety of low-dose treatment of Fubuxostat in chronic hemodialysis patients with hyperuricemia.

Methods: Thirty-two ESRD patients in chronic hemodialysis with hyperuricemia (Male 15, Female 17, mean age 64.8 years, DM 11 patients) were enrolled. Low-dose treatment of Fubuxostat (5-10mg) was prescribed newly in or place of allopurinol 100mg/day. Clinical, hematomatological and biochemical parameters were measured at baseline and 3, 6 and 12 months of treatment. We define our study end points as: (1) reduction of maintenance serum uric acid < 6.0 mg/dl; (2) the effect and tolerability of Fubuxostat.

Results: Serum uric acid levels were significantly decreased from 8.4±1.0 mg/dl to 5.2 ±1.2 mg/dl after 2 weeks (p<0.01). Also, serum uric acid levels were shown under 6.0 mg/dl during treatment. Final average dose of Fubuxostat was 8.8 mg/day, and low dose therapy could keep during the study. There were significantly decreases of total cholesterol (from 1744.40 mg/dl to 1653.34 mg/dl; p<0.01), and especially LDL cholesterol (from 943.29 mg/dl to 802.22 mg/dl; p<0.001) after 12 months. In our study, no serious adverse effects appeared during the treatment.

Conclusions: Low-dose treatment of Fubuxostat can be an effective and safety drug in chronic hemodialysis patients, not only to decrease hyperuricemia quickly and keep lowering serum uric acid for a long time, but also to improve lipid markers finally.

CLINICAL FACTORS AND RENAL FUNCTION AT THE START OF DIALYSIS: IMPACT ON MORTALITY IN INCIDENT HEMODIALYSIS PATIENTS

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Introduction and Aims: The knowledge of the barriers that are associated with decreased physical activity (PA) in patients on chronic hemodialysis (PCh) may be of

TESTOSTERONE, RELATION WITH BODY COMPOSITION AND PHYSICAL ACTIVITY IN HEMODIALYSIS PATIENTS

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Introduction and Aims: CKD induces changes in body homeostasis by altering the production of various hormones, including testosterone. Testosterone has anabolic activity by stimulating the production of muscle mass. Low testosterone levels and muscle mass loss have been associated with increased cardiovascular mortality. Performing physical activity (PA) has mainly beneficial cardiovascular effects. HD patients have lower physical activity that may be partly related to a decreased muscle mass. The aim of this study was to determine the association between testosterone with body composition and physical activity hemodialysis (HD) patients.

Methods: In a cross-sectional study including a total of 78 HD patients we analized: serum testosterone levels (performed by Chemiluminescence, reference values: males 241-827 ng/dl; female 14-76 ng/dl); PA with a geonaute onstep- 400 pedometer; body composition (BC) by bioelectrical impedance measures, and general nutritional and inflammatory biochemical parameters. For the measure of PA patients were asked to use the pedometer during 6 days (2 HD days, 2 non-HD midweek days and 2 non-HD weekend days). Patients with physical limitations (amputation), neurological impairment or recent admission were excluded.

Results: Mean Testosterone levels were 332.70 ± 159.72 ng/dl in men and 29.06 ± 22.37 ng/dl in women (33% men and 36% women had levels below the normal range). We found a direct relationship between testosterone levels and age in the male group, this association does not occur in women. Testosterone keep relationship with BC, associating higher testosterone values greater lean mass (p = 0.011) and lower fat mass (p = 0.010). When we correlate testosteronel levels with physical activity (controlled by gender) we found that higher testosterone levels are associated with greater physical activity (p = 0.046) in males. This correlation was not found in the female group.

Conclusions: The association between testosterone levels and muscle mass loss has been associated with increased cardiovascular mortality.

BARRIERS TO PHYSICAL ACTIVITY IN PATIENTS ON CHRONIC HEMODIALYSIS

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Introduction and Aims: The knowledge of the barriers that are associated with decreased physical activity (PA) in patients on chronic hemodialysis (PCh) may be of
PNEUMONIA IN MAINTENANCE HEMODIALYSIS PATIENTS: DETECTION RATE OF CAUSATIVE ORGANISMS IN SPUTUM V ARIES BY TIME OF SAMPLING AND QUALITY

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Introduction and Aims: Previous studies have demonstrated that almost half the deaths by infection in hemodialysis patients are due to pneumonia. Causative organisms in pneumonia are not defined. We assessed the positive rate of blood and sputum cultures in a cohort of dialysis patients admitted with pneumonia.

Methods: We retrospectively enrolled 50 consecutive pneumonia patients on maintenance hemodialysis attending on outpatient clinic at a single department of nephrology between October 2005 and October 2013. Pneumonia was defined by chest sputum cultures in a cohort of dialysis patients admitted with pneumonia. The severity of pneumonia was scored using the pneumonia severity index (PSI) and the presumed causative organisms were identified.

Results: Among the 50 subjects, median age was 75 (interquartile range, 68 - 78) years, 70.9% were men, 32.4% had chronic obstructive pulmonary disease, and 58.7% had diabetes mellitus. Almost all patients (93.5%) were class IV or V on PSI. Blood cultures were all negative, but 38.0% of sputum cultures were positive. The most common pathogens were Staphylococcus aureus (14.6%), Pseudomonas aeruginosa (8.0%), Escherichia coli (4.0%), and Chlamydia pneumonia (4.0%). The detection rate of causative organisms contribute was related to quality of sputum (group 4 and 5 of Geckler classification) and was 63.5% in samples collected before dialysis on a day of dialysis, and 36.8% in samples collected on the day before a day of dialysis. In contrast, the detection rate was low (18.5%) when samples were collected after dialysis on a day of dialysis.

Conclusions: In hemodialysis patients, the detection rate of causative organisms is elevated if sputum samples are collected before undergoing dialysis on a day of dialysis. Prospective confirmation in a larger number of patients is warranted.

IMPACT OF DIFFERENT TREATMENTS OF SECONDARY HYPERPARATHYROIDISM (PARACALCITOL, ALFACALCIDOL, CINACALCET+ LOW-DOSE ALFACALCIDOL, CINACALCET+ PARACALCITOL) ON FGF-23, TESTOSTERONE, PTH, CA AND P IN DIALYSIS PATIENTS.

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Introduction and Aims: It is known that FGF 23, PTH, P and Ca directly correlate with mortality, but testosterone inversely. Application of vitamin D analogs increase Ca, P, FGF 23 and testosterone, on the contrary cinacalcet can reduce FGF23, Ca , P and testosterone. Both medicines decrease PTH.

Methods: We analysed 75 hemodialysis patients. The enrolled subjects were with IPHT >300 µg/ml. In groups which were treated vitamin D analogs serum P was less then 1,8 mmol/l. We selected 4 groups of dialysis patients with secondary hyperparathyroidism who were treated for up to 6 months: Group 1: 20 patients were treated alfacalcidol in the stable dose of 0.25 µg/day; Group 2: 20 patients were treated with cinacalcet in the stable dose of 30.0 mg/day and alfacalcidol in the dose of 0.25 µg/day; Group 3: patients (n=20) were treated with cinacalcet + alfacalcidol in the stable dose of 30 mg and paricalcitol in the stable dose of 2 µg/day; and Group 4: patients (n=15) were treated paricalcitol in the stable dose of 15 µg a day. Groups were matched for age, gender, time on dialysis. The control group consisted of 15 healthy subjects.

Results: Initial PTH was not significantly different in patients (657.3±284.5; 678.9 ±276.2; 647.4±271.2 and 582.7±284.9 pg/ml, respectively). After 6 months PTH significantly decreased (p<0.01) in all groups, but more considerably in group 3 (-62.4%). In 1 group (8%), in 2 group (-15.9%), in 4 group (-39%). Ca and P significantly increased in groups which were treated with alfacalcidol or paricalcitol, without cinacalcet. P decreased in 2 group (cinacalcet + alfacalcidol), but did not change in 3 group (cinacalcet + paricalcitol). FGF 23 significantly decreased only in groups which were treated with cinacalcet. FGF 23 even increased in 1 group and did not change in 4 group. Testosterone did not significantly change in all groups. PTH, Ca, P, testosterone were normal values and FGF 23 was minimal amount (4.2 ±2.0 pg/ml) in control group. Parameters of patients were shown in table 1. (note - p<0.01 between 0 and 6 months).

Conclusions: The use only alfacalcidol or paricalcitol in the treatment of secondary hyperparathyroidism is associated with increased P, Ca. Alfacalcidol on its own even increased the level of FGF 23. Cinacalcet makes it possible to decrease FGF23 level, even if used in combination with alfacalcidol or paricalcitol. The treatment effect on P, Ca in combination therapy depends on the dose of vitamin D analog. Testosterone values did not change in treatment either with cinacalcet or vitamin D analog.

MP545 Serum concentrations of Ca, P and FGF -23 in dialysis patients with different treatments

<table>
<thead>
<tr>
<th>Groups</th>
<th>Ca, mmol/l, 0 month</th>
<th>P, mmol, 0 month</th>
<th>PFG-23, 0 month</th>
<th>PFG-23, 6 month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patients were treated alfacalcidol, n=20</td>
<td>2,1±0,3</td>
<td>2,5±0,2*</td>
<td>1,4±0,5</td>
<td>1,9±0,6*</td>
</tr>
<tr>
<td>2. Patients were treated cinacalcet + alfacalcidol, n=20</td>
<td>2,1±0,2</td>
<td>2,5±0,3*</td>
<td>2,4±06</td>
<td>2,1±0,4*</td>
</tr>
<tr>
<td>3. Patients were treated cinacalcet + paricalcitol,n=20</td>
<td>2,1±0,3</td>
<td>2,1±0,3</td>
<td>2,3±0,5</td>
<td>2,2±0,7</td>
</tr>
<tr>
<td>4. Patients were treated Paricalcitol,n=15</td>
<td>2,2±0,2</td>
<td>2,4±0,2*</td>
<td>1,5±0,2</td>
<td>1,8±0,4*</td>
</tr>
</tbody>
</table>

Volume 29 | Supplement 3 | May 2014
doi:10.1093/ndt/gfu177 | iii513
Introduction and Aims: Hepatitis C Virus (HCV) infection has a great impact on the prognosis of patients affected by end-stage renal disease. The prevalence of HCV infection in hemodialysis (HD) patients is still significantly higher than the one observed in general population. In this group, the infection bears a strong effect on both mortality and morbidity. Similar considerations can be made for renal transplant (RTx) recipients: in addition to an increased mortality risk due to progressive liver damage, cardiovascular disease, infections and neoplasms, HCV infection is a negative prognostic marker of graft function and survival. Indeed, infected RTx patients have a higher relative risk for post-transplant glomerulonephritis and chronic allograft nephropathy. To date, laboratory confirmation of HCV infection is based on two different principles: immuno-enzymatic assays (EIA), which can be considered as a screening test that identifies anti-HCV antibodies in the patients serum, and molecular biology techniques, based on viral RNA quantification, which are employed as confirmatory and follow-up assays. The latter methods are considered as the gold standard due to their high accuracy, but they are burdened by some negative aspects, such as the high cost, the elevated turnaround time, and the need for dedicated personnel and spaces.

Methods: The primary aim of the study was to determine the accuracy of two EIA for the quantification of HCV core antigen (HCVAg ARCHITECT®) and IgM anti-HCV (DIA.PRO HCV IgM), employed as a confirmatory test in two cohorts of HCV-positive patients (HD and RTx). We analyzed 32 serum samples from HD patients (Group A) from three different hemodialysis facilities, and 11 samples from RTx recipients (Group B). We compared the obtained results with a standardized molecular biology method, a real-time PCR (COBAS® TaqMan® HCV Test, v2.0).

Results: The HCVAg ARCHITECT® immunoassay, used as a confirmatory test for the infection, showed a perfect sensitivity (100%) in both of the two groups of patients, while the specificity was estimated to be 87.5% and 66.7% in Group A and Group B respectively. The DIA.PRO HCV IgM immunoassay showed a lower concordance with the viremia, with a sensitivity of 100% and 85.7%, and a specificity of 75% and 50% in the two groups respectively [Table 1]. Owing to the high sensitivity of both assays in Group A, we considered as positive only the samples which tested reactive for both tests: in HD patients the accuracy of this combined test reached 100%. We also found a strong correlation of the HCV core antigen and the HCV-RNA levels in both Group A and Group B (R = 0.77 and Group B (R = 0.85) [Figure 1].

Conclusions: Both of the assays showed a good accuracy as confirmatory tests for HCV infection. In particular, HCVAg ARCHITECT® proved to be a reliable marker of viral replication, with an extremely good correlation with the viremia in both of the studied cohorts. Therefore, these assays could be a useful complementary tool to the gold-standard diagnostics for HCV infection.
Introduction and Aims: Vitamin D deficiency is associated with insulin resistance while both are with increased cardiovascular risk and prevalent in chronic HD patients. This aim of this study is to investigate the predictors of insulin resistance as well as the impact of vitamin D supplementation on insulin resistance in chronic HD patients.

Methods: We conducted a cross-sectional, observational study and collected the demographic, clinical, laboratory, and the measured Homeostasis Model Assessment-Insulin Resistance (HOMA-IR) data in chronic HD patients (aged ≥ 16 years).

Results: Among the enrolled 110 patients, 35 (32%) were type 2 diabetes subjects. In all chronic HD patients, male, higher triglycerides (TG) and hemoglobin were associated with higher log-HOMA-IR. In non-diabetic chronic HD patients, higher Hba1c, TG, and creatinine were associated with higher HOMA-IR. Vitamin D supplementation was associated with lower HOMA-IR in non-diabetic patients. (P=0.002)

Conclusions: TG seems to be the constant predictor of HOMA-IR in all or non-diabetic chronic HD patients. Vitamin D supplementation was associated with lower HOMA-IR only in non-diabetic chronic HD patients.

MP551
FRAILTY IS SIGNIFICANTLY RELATED TO PHYSICAL PERFORMANCE FUNCTION IN MAINTENANCE HEMODIALYSIS PATIENTS

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Introduction and Aims: Frailty is very common concerns in maintenance hemodialysis (MHD) patients, which is associated with disability, hospitalization and mortality. However, there is only few study reporting the relation between frailty and physical performance function in this population.

Methods: This ongoing study has recruited ambulatory MHD patients aged ≥20 years (y) old on MHD ≥8 months, without hospitalization history for the previous 3 months. We adopted frailty phenotype composed of the following components; 1) unintentional weight loss more than 4.5 Kg or 5% of the previous body weight for the last 1 year, 2) physical inactivity, 3) RAND-36 physical function (PF) scale <75 and vitality (VT) scale <55 as surrogates for weakness/slowness and exhaustion, respectively. Low physical performance scale was scored as 2 points and other components as 1 point for each. Those with 3 or more points were considered as “frail”. Short physical performance battery (SPPB), sit to stand test (STS30, the number of sit to stand cycles completed for 30 seconds), 6 minute walk (6MWT, distance in meters measured for 6 minutes) and timed up and go (TUG, seconds) tests were measured the day after hemodialysis treatment. Demographic and laboratory data were obtained by review of medical records.

Results: Thirty three patients evaluated were 57.5±11.6 years of age (mean±SD) on MHD for 5.2±5.4 years (y); 49.2% were male. Frail patients was 28.6% (9/32), who were more likely to be older (64.4±10.4 vs. 54.8±10.9; P=0.05), diabetes (32% vs. 44.4%; P=0.05), have higher Charlson-Comorbidity Index (CCI) (6.9±1.9 vs. 5.0±2.1; P<0.001) and lower 25-hydroxyvitamin D (25OHD) level (ng/ml) (9.6±4.9 vs. 13.4±4.8; P=0.05). Frailty was significantly associated with lower SPPB scores (10.2±1.4 vs. 11.4±1.0; P<0.001), lower STS30 (14.3±3.9 vs. 19.5±5.4; P<0.001), lower 6MWT (377±92.2 vs. 493.7±67.3; P<0.001) and longer TUG (s) (8.9±1.7 vs. 6.8±1.7; P<0.001). In multivariate analysis, SPPB, STS30, 6MWT and TUG showed significant association with each frailty component (odds ratio [95% CI]): 0.65 (0.33-1.35) [0.05]; 0.45 (0.23-0.85) [0.05]; 0.67 (0.40-1.16) [0.05]; 1.67 (1.08-2.59) [0.05] respectively with frailty, after adjustment for age, gender, DM, CCI, levels of hemoglobin, albumin and 25OHD.

Conclusions: Frailty is very common even in relatively stable MHD patients. Frailty phenotype is useful to reflect impaired physical performance function in MHD population.

MP552
ASSOCIATION BETWEEN HIGH-DEGREE LIPOPROTEINS, BETA2-MICROGLOBULIN AND INFLAMMATION IN PATIENTS ON RENAL REPLACEMENT THERAPIES

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Introduction and Aims: High-density lipoprotein (HDL) protects against atherosclerotic plaque formation. Beta2-microglobulin (beta2M) is accumulated in the circulation of dialysis patients. The present study examined the relationship between HDL serum concentrations, beta2M and markers of inflammation in patients on renal replacement therapies.

Methods: We studied 96 dialyzed patients, 62 males and 34 females, on mean age 62.1 ±4.27 years old and 24 healthy controls. The treatment modalities which were applied were: regular hemodialysis (HD, n=34), predilution hemodiafiltration (HDF, n=42) and peritoneal dialysis (PD, n=20). Dialysis adequacy was defined by Kt/V urea for urea and serum bicarbonate levels were measured in gas machine. Cholesterol, triglycerides, HDL, and serum concentrations were biweekly measured. beta2M serum concentrations were measured by ELISA. Beta2M and leptin serum concentrations were measured by radioimmunoassays.

Results: The patients presented increased beta2M, hsCRP, leptin and triglycerides than control group, but HDL exhibited significant reduction (p<0.05). The patients on PD had significantly higher serum bicarbonate levels than other groups of patient (p<0.05). HDL positively associated with Kt/V, presented negative correlation with beta2M (r=-0.291, p=0.004). Suppotringly, the patients with high beta2M values (higher than the median value = 26 mg/L) simultaneously had low HDL serum concentrations (lower than the median value = 38.8 mg/dL) (x² = 9.379, p=0.004). Beta2M was positively associated with hsCRP (r=0.257, p=0.01), which, in the meantime, was inversely associated with serum bicarbonate levels (r=-0.232, p=0.05), but positively associated with leptin concentration.

Conclusions: The low HDL was associated with increased beta2M concentrations in patients on renal replacement therapies. The HDL reduction was lower in PD patients compared to hemodialysis modalities patients. The acidosis state influenced the inflammatory environment and dialysis adequacy was positively correlated to HDL serum concentrations.

MP550
ASSOCIATION BETWEEN HIGH-DENSITY LIPOPROTEINS, BETA2-MICROGLOBULIN AND INFLAMMATION IN PATIENTS ON RENAL REPLACEMENT THERAPIES

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Introduction and Aims: In hemodialysis (HD) patients, hemodynamics is unstable by ultrafiltration and extracorporeal circulation during dialysis therapy. It was easily considered that improvements of activities of daily living (ADL) in dialysis patients affect beneficially on hemodynamics during the HD therapy, however details are still unclear. To clarify this issue, we investigated the relation between ADL of HD patients and hemodynamical or biochemical data at the initial time and one year after the initiation of HD.

Methods: We employed retrospectively 47 HD patients, treated regularly 4 to 5 hours HD therapy 3/week (64.1±15.1 years, n=47) one year after the initiation of HD therapy. They were divided into three groups. 1) wheelchair group (n=9); patients in need of a wheelchair when moving, 2) DM group; patients with diabetes mellitus and a free standing ADL (n=16), 3) NDM patients with non-diabetes and a free standing ADL (n=22). A decline in ADL in the wheelchair group was caused by cerebrovascular diseases, diabetic neuropathy and disuse syndrome. General condition of all subjects was basically stable and continued the same dialysis method during the observation period. Following data were obtained at the start of dialysis beginning of the week; 1) systolic blood pressure at the start of dialysis, 2)lowest systolic blood pressure during dialysis, 3) systolic blood pressure decrease calculated by a subtraction of 1) minus 2), 4)daily urinary volume and 5)laboratory data (blood urea nitrogen (BUN), creatinine (Cre), albumin (Alb), Ca, P, LDL-Cholesterol, hemoglobin).

Results: There were no significant differences among the three groups about background factors (age, body mass index and dialysis period). There were significant differences in NDM group (22.5±14.6 mmHg) and the wheelchair group (69.6±35.3 mmHg) on the systolic blood pressure decrease calculated by a subtraction of 1) minus 2), (p<0.001). While, there were no significant differences on ultrafiltration volume in HD session between the two groups. According to the urinary volume, there were no differences among the three groups at the initial dialysis therapy. However, that of the wheelchair group was dramatically decreased (164 ± 222 mL /day) compared to that in DM group (653 ± 572 mL /day) and NDM group (658 ± 462 mL /day) one year after the initiation of dialysis therapy (p<0.05). Alb level in the wheelchair group was significantly lower than that of the other two groups at initial dialysis therapy (p<0.05), however the difference had disappeared after one year. There were no differences about BUN levels among the three groups during the observation period. On the contrary, Cre level of the wheelchair group was significantly decreased (8.2 ± 2.4 mg/dL) compared to that in DM group (653 ± 572 mL /day) and NDM group (658 ± 462 mL /day) one year after the initiation of dialysis therapy (p<0.05). While there were no differences among the three groups at the initiation of dialysis therapy.

Conclusions: The wheelchair group with reduced ADL decreased markedly in systolic blood pressure during the dialysis session. Cre value of this group decreased one year after the initiation of HD though Alb level was improved. This tendency was not observed in the group with free standing dialysis patients but was characteristic of ADL reduction group. These results suggest that a decrease in motor function leads to a decrease in muscle mass, which leads to hemodynamic dysfunctions during dialysis. An improvement of motor functions and ADL may stabilize the hemodynamics during dialysis therapy.