SP648 TEN YEARS SURVIVAL AND MORTALITY RISK FACTORS AMONG CHRONIC DIALYSIS PATIENTS IN AN ITALIAN REGION
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Introduction and Aims: End-stage renal disease patients on renal replacement therapy are at high risk of mortality. Survival analysis among these subjects may be useful to identify predictable risk factors. The aim of the study is to analyze cumulative survival at 10 years and the determinants of mortality among patients undergoing renal replacement therapy.

Methods: Source of data is Lazio Dialysis Registry. We enrolled and followed-up 7234 subjects starting chronic dialysis in Lazio dialysis units from 1-1-1995 to 31-12-2004. Survival analysis was performed using Kaplan-Meier method. A Cox multivariate model was preferred to analyze mortality determinants.

Results: We observed 2794 deaths in the whole cohort. The survival proportion was: 87% (95%CI 86.2-87.7%) at 1 year, 77% (95%CI 76-78%) at 2, 68.6% (95%CI 67.3-69.7%) at 5, 61.4% (95% CI 60.1-62.7%) at 4, 55.7% (95%CI 54.3-57.1%) at 5, 50.7% (95%CI 49.2-52.2%) at 6, 46.5% (95%CI 44.9-48.1%) at 7, 43.5% (95%CI 41.6-45%) at 8, 41.1% (95%CI 39.9-43%) at 9 and 36.9% (95%CI 37.3-41.9%) 10 years after undergoing chronic dialysis. Median survival was 73 months. A lower survival (log-rank test, p=0.001) was found among subjects who at the beginning of chronic dialysis were older than 64, diabetic, HCV-positive; we did not find differences for gender (log-rank test, p=0.38). The multivariate Cox model showed a higher mortality risk among patients who at the beginning of chronic dialysis were older than 64 (HR 2.59 IC95% 2.35-2.86), diabetic, HCV-positive; we did not find differences for gender (log-rank test, p=0.38). The multivariate Cox model showed a higher mortality risk among patients who at the beginning of chronic dialysis were older than 64 (HR 2.59 IC95% 2.35-2.86), diabetic (HR 1.41 IC95% 1.29-1.54), HCV-positive (HR 1.19 IC95% 1.15-1.29). LDLC-cholesterol level <300 (HR 1.26 IC95% 1.15-1.37), with serum albumin level <3.5 grams/dl (HR 1.37 IC95% 1.27-1.49), with a low self-sufficiency degree (HR 2.08 IC95% 1.90-2.26) and male (HR 1.24 IC95% 1.14-1.34). We did not find a higher mortality risk for type of dialysis and for subjects undergoing dialysis in the period 1995-1999 compared to 2000-2004. Conclusions: Few Italian studies performed population-based 10 years survival analysis among chronic dialysis patients. Our survival proportion at 1 year (87%) was better than other European (84%) and U.S. studies (78%). The findings about mortality determinants suggest to focus prevention activity in pre-dialysis period, for conditions as malnutrition and anaemia and for pathologies as diabetes and HCV-virus infection.

SP649 SERUM OXIDIZED-LDL IS INVERSELY CORRELATED TO TELOMERASE ACTIVITY IN PERIPHERAL BLOOD MONONUCLEAR CELLS OF HEMODIALYSIS PATIENTS
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Introduction and Aims: Telomerase preserves telomeres’ function and structure preventing cellular senescence. Its activity is reduced in peripheral blood mononuclear cells (PBMCs) of hemodialysis (HD) patients. The purpose of this study is to investigate the potential correlation between increased oxidative stress/inflammation and telomerase activity in PBMCs of HD patients.

Methods: Telomerase activity was measured by PCR-ELISA in PBMCs isolated from a group of 42 HD and 39 non-renal failure subjects. Serum oxidized-LDL (ox-LDL), Tumor Necrosis Factor – α (TNF) and Interleukin-10 (IL-10) was also measured in both groups by ELISA.

Results: Serum levels of ox-LDL and TNF were significantly higher in HD patients than in control subjects (91.2±33.9 vs. 66.9±26.4 U/L and 24.5±6.1 vs. 17.4±7.1 pg/ml, P = 0.001 and < 0.001, respectively). OX-LDL was negatively correlated to % telomerase activity in PBMCs (r = -0.506, P = 0.000 in the whole group of 81 HD and normal subjects and r = -0.559, P = 0.000 in HD patients). TNF was also inversely associated with % telomerase activity in the whole group studied (r = -0.492, P = 0.000) while IL-10 was not. In stepwise multiple linear regression, taking into consideration the most important characteristics of the HD patients and control group, the only significant predictors for % telomerase activity in PBMCs were ox-LDL and TNF (β = 0.421, t = -4.083, P = 0.000 and β = -0.381, t = -3.691, P = 0.000, respectively) while examining separately HD patients, the predictors for the same parameter were ox-LDL and HD duration (β = -0.671, t = -7.409, P = 0.000 and β = -0.349, t = -2.447, P = 0.023, respectively).

Conclusions: Ox-LDL serum level is inversely correlated to telomerase activity in PBMCs of HD patients. Our study proposes a new consequence of increased oxidative stress in HD patients: the premature cellular senescence potentially related to atherosclerosis through LDL oxidation.

SP650 OUTCOME, PROGNOSIS FACTORS AND ANTIRETROVIRAL PRESCRIPTIONS IN FRENCH HIV HEMODIALYZED PATIENTS
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Introduction and Aims: HIV infected hemodialyzed patients have a worse prognosis than non infected hemodialyzed patients. Despite abundant literature, their outcome in the High Activity Anti-Retroviral Therapy era remains unclear. We determined survival and mortality risk factors in patients enrolled in the French cohort of HIV infected hemodialyzed patients.

Methods: HIV infected hemodialyzed patients were numbered in France on January 1st, 2002 (cross sectional study), and prospectively followed until January 1st, 2004. Survival was estimated by Kaplan Meier method and mortality risk factors were analyzed by uni- and multivariate analyses. The prescribed doses of anti-retroviral agents were compared to what is recommended for hemodialysis patients.

Results: 27 577 patients benefited from hemodialysis in France on 01/01/2002, 164 (0.59%) of which were HIV infected. Their clinical characteristics are the following: males: 72%, mean age: 44.8±10.9 years, black: 65%, HCV co-infection: 27% and HBV co-infections: 15%. During follow up, 17 patients died (mean HIV infection duration: 9.5±5.4 years). The death causes are infections, cancers and sudden deaths. Two-year cohort survival rate is 89±2±2%. Significant risk factors for death in univariate analysis are: a low CD4 cell count (hazard ratio [HR] 1.4 every less 100 CD4 cells/mm3, p<0.04 and HR 6.0 if CD4 cell count is less than 200/mm3, p<0.0001), a high viral load (HR 2.5 every other Log/ml; p<0.0001), the absence of HAART (HR 2.7; p<0.05) and a history of opportunistic infection (HR 3.7; p<0.01). Viral load (HR 2.6; p<0.0001) and history of opportunistic infection (HR 3.6; p<0.05) were independent prognosis factors. HIV immuno-virological parameters were controlled in only 41% of the patients. More than 50% of the patients receiving lamivudine, didanosine and stavudine were prescribed 196%-386% of the daily recommended dose for hemodialyzed patients. Conversely, the prescribed dose of indinavir, ritonavir and saquinavir are commonly insufficient (34%-61% of the daily recommended dose).

Conclusions: HIV infection is not optimally controlled in hemodialyzed infected patients. Survival greatly depends on HIV infection-related parameters. A better collaboration between caregivers and extension of HAART use in this young population might improve survival.

Haemodialysis 2

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ISSUE OF MENOPAUSE IN HEMODIALYSIS FEMALE PATIENTS

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Introduction and Aims: The end stage renal disease has accompaniments in body systems, including hormonal changes. Information on age at or reasons for the permanent cessation of menses among women with end stage renal disease on regular dialysis remains limited. The present pilot study was designed to evaluate the issue of menopause in Czech hemodialysis female patients.

Methods: Ten hemodialysis patients (HD) and ten age-matched controls (age range, 40-57 years) were enrolled. All women completed a questionnaire asking about pregnancies, menstrual periods (regularity, frequency, duration, character of flow, menopause), use of hormonal contraception, current and past estrogen replacement therapy and gynecologic counseling. Levels of thyroid stimulating hormone, thyroxin, triiodothyronin, prolactin, cortisol, testosterone, estradiol, androstendion, luteinizing hormone, follicle stimulating hormone (FSH), sex hormone binding globulin were measured. The results were compared in HD female patients and controls.

Results: In the group of HD patients five women showed androgen hormonal levels in the normal range of controls. One HD patient was with regular menses and four patients were postmenopausal, aged at around 50 years. The sixth HD patient was after hysterectomy due to gynecologic cause, hormonal spectrum was postmenopausal, aged 53 years. Among the rest four patients, one female patient, aged 38 years, showed normal androgen hormone and prolactine levels with menses ceased probably due to secondary amenorhea. Three patients reported permanent cessation of menses aged from 42 to 48 years due to either secondary amenorhea or earlier onset of menopause.

Conclusions: Permanent cessation of menses in HD female patients does not necessarily imply the onset of menopause. Serum FSH levels should be measured in HD patients with amenorrhea to confirm menopausal status and rule out secondary amenorhea. More extensive studies are needed to confirm this hypothesis.

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GABAPENTIN TREATMENT FOR URAEMIC PRURITUS IN HAEMODIALYSED PATIENTS

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Introduction and Aims: Pruritus is a major disorder among the skin derangements in patients with chronic renal failure on dialysis treatment. The pathophysiology of uraemic pruritus is poorly understood. Several treatment methods have been proposed to help patients suffering from this symptom, including pharmacologic and nonpharmacologic options, but their efficacy is still unsatisfactory. Gabapentin is a novel anticonvulsant with an unknown mechanism of action that has been reported to ameliorate itch associated with chronic uraemia. The aim of this study was to examine whether gabapentin intake could be effective in controlling uraemic pruritus.

Methods: 12 pruritic patients (male/female, 5/7; age, 25-62 years) with chronic uraemia. The aim of this study was to examine whether gabapentin intake could be effective in controlling uraemic pruritus. Gabapentin is a novel anticonvulsant with an unknown mechanism of action that has been reported to ameliorate itch associated with chronic uraemia. The mechanism of action that has been reported to ameliorate itch associated with chronic uraemia. The aim of this study was to examine whether gabapentin intake could be effective in controlling uraemic pruritus.

Methods: Gabapentin treatment is still unsatisfactory. Gabapentin is a novel anticonvulsant with an unknown mechanism of action that has been reported to ameliorate itch associated with chronic uraemia. Gabapentin is a novel anticonvulsant with an unknown mechanism of action that has been reported to ameliorate itch associated with chronic uraemia. Gabapentin is a novel anticonvulsant with an unknown mechanism of action that has been reported to ameliorate itch associated with chronic uraemia. Gabapentin is a novel anticonvulsant with an unknown mechanism of action that has been reported to ameliorate itch associated with chronic uraemia.

Results: In the group of HD patients five women showed androgen hormonal levels in the normal range of controls. One HD patient was with regular menses and four patients were postmenopausal, aged at around 50 years. The sixth HD patient was after hysterectomy due to gynecologic cause, hormonal spectrum was postmenopausal, aged 53 years. Among the rest four patients, one female patient, aged 38 years, showed normal androgen hormone and prolactine levels with menses ceased probably due to secondary amenorhea. Three patients reported permanent cessation of menses aged from 42 to 48 years due to either secondary amenorhea or earlier onset of menopause.

Conclusions: Permanent cessation of menses in HD female patients does not necessarily imply the onset of menopause. Serum FSH levels should be measured in HD patients with amenorrhea to confirm menopausal status and rule out secondary amenorhea. More extensive studies are needed to confirm this hypothesis.

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STUDY OF SLEEPING DISORDERS AMONG END STAGE RENAL DISEASE PATIENTS ON MAINTENANCE HAEMODIALYSIS: DOES HAEMODIALYSIS IMPROVE THESE DISORDERS?

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Introduction and Aims: Dialysis patients frequently complain of insomnia, excessive daytime sleepiness, restless leg syndrome and sleep apnea. Uremia is considered as a major factor for developing sleep disorders in chronic renal failure patients.

Methods: This study included forty subjects, thirty patients with chronic renal failure and ten normal subjects as a control group. Patients were classified into two groups. Group I (n=20), included those patients with chronic renal failure on maintenance hemodialysis, while Group II (n=10), included those patients with chronic renal failure in predialysis stage.

Results: Polysomnographic data in uremic patients, compared with control group showed significant rise in sleep onset and arousal index (p=0.004, 0.001 respectively). Also sleep efficiency and slow wave sleep (deep sleep) were significantly reduced in uremic groups of patients (p=0.001, 0.000 respectively). Restless leg syndrome was prevalent in uremic patients with significant increase of limb movement index than in control group (P=0.04). The present study revealed that uremic patients had several respiratory problems. Their desaturation index was higher than control group (P=0.017); they have lower oxygen saturation during sleep than control group, with higher respiratory disturbance index (P=0.00, 0.009 respectively). These findings indicated the presence of sleep apnea that was mainly obstructive in nature among hemodialysis patients.

There was no significant difference between patients on hemodialysis and predialysis patients in all the previously mentioned parameters. There was a significant negative correlation between blood urea and sleep efficiency, and a significant positive correlation between serum creatinine and arousal index in the two uremic groups of patients (P=0.04, 0.03 respectively).

Conclusions: It was concluded that sleep disorders are prevalent and variable among uremic patients and conventional hemodialysis did not improve neither sleep disorders nor sleep apnea found in those patients.
LYMPHOCYTE SUBSETS IN PEDIATRIC PATIENTS WITH CHRONIC RENAL INSUFFICIENCY

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Introduction and Aims: The defects in immunity in chronic renal insufficiency (CRI) may be caused by the uremic state itself or may result from hemodialysis (HD) treatment. The major defects in the immune system appear to be in cell mediated immunity. We aimed to study lymphocyte subsets in CRI, in addition to the effect of HD with various dialyzing membranes and erythropoietin (EPO) therapy on these subsets.

Methods: The study was conducted in the Pediatric Dialysis Unit, Children’s Hospital, Ain Shams University, on 38 pediatric patients that were classified into 3 groups. Group A included 18 patients with CRI under regular HD, their ages ranged from 10-16 (mean ± SD = 13.06 ± 1.79) years and the duration of disease ranged from 1-84 (33.06 ± 27.45) months. They were subdivided into 2 subgroups according to EPO therapy. Hemodialysis was performed using polysulfone and cuprophan membranes sequentially. Group B included 10 patients with CRI under conservative management, their age ranged from 7-15 (11.5 ± 2.7) years and the duration of disease ranged from 6-60 (21.2 ± 18.42) months. Group C (control) included 10 age and sex-matched healthy subjects. In addition to clinical evaluation, laboratory investigations including renal functions, complete blood count and enumeration of lymphocyte subsets CD4, CD8 (for T-cells), CD19 (for B-cells) and CD56 (for natural killer cells) using flowcytometry were also done for all subjects.

Results: Our results revealed that CRI caused a decrease in absolute lymphocytic count (ALC) as well as all subsets. HD with polysulfone lead to significant increase in ALC compared to groups B and C. There were also an increase in CD19 and CD56 compared to group B but still lower than group C. Concerning the effect of dialyzer membranes the only change was a significant decrease in CD19 and CD56 with cuprophan compared to polysulfone. EPO therapy caused a significant decrease in ALC, CD8 and CD56 while CD19 showed a significant increase compared to HD patients not receiving EPO.

Conclusions: CRI alone caused a decrease in ALC and all its subsets. Hemodialysis further affects ALC negatively, while CD19 and CD56 are increased. Cuprophan membrane negatively affects CD19 and CD56 compared to polysulfone. EPO therapy has an additional negative effect on ALC and all subsets except for CD4 in HD patients. It is suggested to add lymphocyte subsets to the parameters of biocompatibility.

ORAL DELIVERY OF MICROENCAPSULATED ENZYMES AND ENGINEERED CELLS FOR THE REMOVAL OF NON-PROTEIN NITROGEN COMPOUNDS: IN-VITRO AND PRELIMINARY IN-VIVO STUDIES

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Introduction and Aims: In its macroenvironment, nature has evolved sophisticated enzymatically-modulated biochemical pathways to recycle non-protein nitrogen compounds, such as urea, creatinine, and uric acid, first to ammonia and eventually to amino acids. Despite the increasing burden of uremic disease, little research is focused upon the exploitation of these pathways for deparative purposes. Our studies were undertaken in order to learn (1) whether enzymes or genetically modified cells which contain them are capable of first order degradation of NPN compounds (2) explore methods to encapsulate such materials in microcapsules suitable for oral administration, and (3) to evaluate the capacity of such orally delivered capsules to degrade multiple uremic toxins in invivo animal models of renal failure.

Methods: Enzymes to degrade urea (jackbean urease), creatinine (flavobacterium creatininase), and uric acid (arthribacter globomorisor uricase) were identified and dispersed in 500 micron alginate microcapsules. The resultant capsules were evaluated in-vitro in classic Michaelis-Menten kinetic studies. Parallel in-vitro studies were conducted with E. Coli DH-5 cells (S Mulrooney) containing the urease plasmid pkAU17 from klebsiella aerogens along with an ampicillin resistant gene and E Coli JM109 Cells (Y Koyama) containing the uricase plUXO21 plasmid. Both sets of microcapsules were subsequently evaluated in vivo in a sprague dawley rat model of acute renal failure; renal necrosis was induced by intramuscular injection of glycerine and the subsequent rise in urea, creatinine, and uric acid was compared in animals receiving oral capsules with untreated controls.

Results: In vitro experiments, capsules containing <1000 units (50 mg) of mixed enzymes cleared 20-100% of urea, creatinine and uric acid from 100 ml of simulated uremic plasma in 24 hours and similar results were obtained from encapsuled genetically modified cells. In-vitro, orally administered microcapsules are capable of removing 70% of the urea and uric acid and 50% of the creatinine produced in the functionally anephric rodents over a 24 hour period. The presence of an anion exchange resin to scavenge ammonia ions was found necessary for effective removal of urea but not uric acid or creatinine. Bacteria and enzymes were biochemically equivalent in their deparative impact and the choice between the two would be based upon formulary considerations.

Conclusions: Delivery of biochemically active capsules might lessen the frequency or duration of HD or CAPD, or might improve outcomes at existing therapy levels. In any case, it appears time for the community to take a fresh look at sorption and removal as an alternative to transport in the treatment of chronic uremia.

INVOLVEMENT OF SYMPATHETIC OVERACTIVITY IN SYSTOLIC HYPERTENSION IN NONDIABETIC HEMODIALYSIS PATIENTS

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Introduction and Aims: Systolic hypertension is one of the major complications in maintenance hemodialysis patients which may lead to severe cardiovascular diseases. The sympathetic nervous activity has reportedly been enhanced in patients with end-stage renal diseases. In this study, we investigated whether imbalance of the autonomic nervous system is involved in systolic hypertension in hemodialysis patients.

Methods: Twenty-four hour Holter electrocardiography with time- and frequency-domain analyses of the heart rate variability was carried out in 61 nondiabetic (62.1 ± 10.5 years) and 61 diabetic hemodialysis patients (62.1 ± 11.4 years) between dialysis sessions. We calculated the percentage of differences between adjacent NN intervals more than 50 msec (pNN50) in time-domain measures, and total frequency (TF), low frequency component (LF, 0.04-0.15 Hz) and high frequency component (HF, 0.15-0.40 Hz) in frequency-domain measures: pNN50 and HF as parameters of the cardiac parasympathetic activity, and the ratio of LF/HF as a parameter of cardiac sympathetic activity with vagal modulation.

Results: In nondiabetic hemodialysis patients, LF/HF ratio correlated with systolic blood pressure before dialysis (r = 0.519, n = 61, P = 0.0001) and after dialysis (r = 0.518, n = 61, P = 0.0001), but not in diabetic patients. In multiple regression analysis, LF/HF ratio was associated with systolic blood pressure before dialysis and after dialysis in nondiabetic hemodialysis patients (Table). However, LF/HF ratio was not associated with systolic blood pressure.

Multiple regression analysis of systolic blood pressure regarding relation with the heart rate variability in nondiabetic hemodialysis patients

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<th>β</th>
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<tr>
<td>Systolic blood pressure before dialysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TF</td>
<td>0.300</td>
<td>1.342</td>
</tr>
<tr>
<td>HF</td>
<td>-0.310</td>
<td>-1.428</td>
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<tr>
<td>LF/HF</td>
<td>0.450</td>
<td>3.658</td>
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<tr>
<td>pNN50</td>
<td>-0.038</td>
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Systolic blood pressure after dialysis

| TF       | 0.125  | 0.552 | 0.583 |
| HF       | -0.184 | -0.838| 0.405 |
| LF/HF    | 0.477  | 3.833 | 0.0001 |
| pNN50    | -0.020 | -0.142| 0.888 |
with systolic blood pressure before or after dialysis in diabetic patients. The parasympathetic parameters such as HF or PNN50 were not related with systolic blood pressure before or after dialysis in nondiabetic and diabetic hemodialysis patients.

Conclusions: Sympathetic overactivity is likely to play a role in systolic hypertension in nondiabetic hemodialysis patients. In diabetic hemodialysis patients, involvement of the sympathetic activity in systolic blood pressure may be hindered by diabetic neuropathy.

### SP657 COMPARISONAL MANAGEMENT OF HEMODIALYSIS CATHETER RELATED INFECTION WITH AND WITHOUT AN ADJUNCTIVE ANTIBIOTIC LOCK SOLUTION

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Introduction and Aims: Central vein catheter are using as a temporary vascular access in hemodialysis patients. Catheter related infections are the most serious complication in this setting. Treatment of this infection without catheter removal is very important. Recently, it has been shown that antibiotic lock of the catheter is effective in the treatment of catheter related septicemia. The aim of this study was to compare the effect of systemic antibiotic therapy with and without antibiotic lock in the treatment of catheter related infection.

Methods: In a controlled clinical trial we included 49 dialysis patients who had catheter related bacterial infection (from 257 patients with central vein catheter) between 2003 to 2005. These patients were divided into two groups randomly. Group 1: patients who treated with systemic antibiotic with vancomycin and amikacin with therapeutic dose. Group 2: patients who treated with systemic antibiotic as described a bow plus antibiotic lock solution (vancomycin 10 mg plus heparin and normal saline) after each dialysis session. Then statistical analysis was performed using SPSS (t test).

Results: Mean age of patients was 54.5 ± 4.16 years with male to female ratio of 27/22. There was no significant difference regarding demographic parameter, site of inserted catheter, causes of CRF, and early non infectious complications after catheter insertion. There was also no significant difference in frequency of fever and chill, mean blood pressure, mean leukocyte count, and blood culture results, between two groups. There was significantly better control of catheter related infection in patients who treated with systemic antibiotic plus antibiotic lock solution. (P < 0.001).

Conclusions: In conclusion, it seems that antibiotic lock of infected hemodialysis catheter is safe without any side effects with considerable reduction of catheter removing. We recommended its use in the treatment of hemodialysis catheter related septicemia.

### SP658 PSYCHOSEXUAL DISORDERS IN RELATION TO PARAMETERS OF DIALYSIS ADEQUACY

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Introduction and Aims: The aim of this study is to investigate the prevalence of psychosexual problems in our dialysis patients and their possible relation to parameters of dialysis adequacy.

Methods: Sixty patients on regular thrice weekly hemodialysis were randomly selected from several dialysis units and were subjected to assessment of psychiatric functions using Zung scale fordepression,Taylor test for anxiety,Laupocisi questionnaire for quality of life,mimimalent state test for cognitive functions,as well assessment of sexual functions using sexual functions questionnaire about desire,frequency,errection in males,orgasm,sexual petting and satisfaction of the other partner.Parameters of dialysis adequacy asKt/V,nPCR, and nerve conduction velocity were also assessed.

Results: We detected depressive symptoms in only 21.7% of patients[20%mild,1.7%moderate,and none with severe symptoms],anxiety symptoms were detected in 70%of cases[20%mild,36.7%moderate,and13.3%severe symptoms].Cognitive functions were mildly impaired in few cases,while quality of life questionnaire showed impairment in 98.4%of cases.As regards sexual functions,frequency was impaired in 96.7%of cases,desire was impaired in 93.3% of cases,erection was impaired in45.8% of males,while orgasm was impaired in76.6% of females.However,we could not detect sig-nificant correlation of either sexual or psychiatric dysfunctions with each other, nor with KT/V,nor with nPCR.

Conclusions: It may be concluded that urea kinetic equations are not satisfactory for judgement of the overall wellbeing of dialysis patients and that regular assessment of sexual and psychiatric functions should be performed routinely in dialysis units.

### SP659 LOSS OF HEPATITIS B IMMUNITY EITHER NATURALLY ACQUIRED OR AFTER VACCINATION IN HEMODIALYSIS PATIENTS

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Introduction and Aims: The aim of this study was the longterm assessment of hepatitis B immunity and the titer of antibodies (anti-Hbs) which were acquired naturally or after vaccination in hemodialysis patients.

Methods: Thirty-nine hemodialysis patients were followed up for a mean time of 25.1 months (range 6-30). Sixteen of them acquired immunity (anti-Hbs>10iu/ml) after vaccination (group A), while the remaining 23 were not vaccinated and had anti-Hbs>10iu/ml and anti-Hbc (+) antibodies, suggestive of natural infection. In all patients anti-Hbs were determined every six months, starting 6 months after the last vaccine dose in vaccinated patients. Anti-Hbs titers>10iu/ml were considered protective. Age, sex, presence of diabetes mellitus, duration of dialysis did not differ between the two groups.

Results: Four patients of group A (25%) and two patients of group B (9%) lost immunity during the follow up period (anti-Hbs<10iu/ml) (p=ns). At the start group A had significantly higher anti-Hbs titers than group B (p<0.05). This difference was continued throughout the first year of the follow up. However, after the first year anti-Hbs titers were decreased significantly in group A compared to group B (p<0.05).

Conclusions: In conclusion, hemodialysis patients may progressively lose hepatitis B immunity acquired either naturally or after vaccination. Anti-Hbs titers may decrease faster in vaccinated dialysis patients than in those with natural acquired immunity who tend to hold rather stable titers for a longer period.

### SP660 URIC ACID, PARATHORMONE AND INSULIN RESISTANCE IN HAEMODIALYSIS PATIENTS

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Introduction and Aims: Uric acid levels have been associated to various components of metabolic syndrome in general population. The aim of the study was to investigate the relation of insulin resistance (IR) to uric acid and other parameters in patients undergoing haemodialysis.

Methods: In 32 (16M, 16F) patients, 59.5±15.9 years old, on dialysis for 46±3.2 months, we measured serum glucose and insulin (prior to a midweek session), as well as weight, height and waist, hip circumferences. For each patient, levels of serum Ca, P, parathormone (PTH), uric acid and albumin were recorded during last fifteen months. Body Mass Index (BMI), waist to hip (W/H) ratio and IR according to Homeostasis Model Assessment (HOMA) were also calculated.

Results: Patients were stratified in two groups based on histogram (Group 1: 18 patients with HOMA-IR < 5 μIUx mg/100 ml 2 - Group 2: 14 patients with HOMA-IR ≥ 5 μIUx mg/100 ml 2) and compared with Kruskal-Wallis ANOVA.

Results: Differences of parameters (mean±SD) between two groups were as in the table:
Additionally to expected associations between anthropometric variables, in Group 1 BMI was associated to serum insulin and in Group 2 levels of uric acid associated to those of PTH.

**Conclusions:** Dialysis patients with higher -versus those with lower- insulin resistance may have greater levels of anthropometric markers and decreased serum P. Uric acid levels did not differ significantly, but in those with higher insulin resistance are associated to PTH. This may be due to the role of uric acid on activation of renin-angiotensin system, the latter being negatively regulated by vitamin D.

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**SP661** | REDUCED EXPRESSION OF TOLL-LIKE RECEPTORS 2 AND 4 ON MONOCYTES AND ALTERATION OF BALANCE BETWEEN TWO FUNCTIONAL SUBSETS OF DENDRITIC CELLS IN HEMODIALYSIS PATIENTS

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**Introduction and Aims:** Hemodialysis (HD) patients are predisposed to bacterial infections, but it is unclear what in their immune dysfunction is most relevant to this. Toll-like receptors (TLRs) 2 and 4 on immune cells play a pivotal role in pattern recognition of bacterial lipopolysaccharides and subsequent synthesis of cytokines which eliminate invasive bacteria. TLR surface expression occurs on peripheral blood monocytes and immature dendritic cells (DCs). DCs are the most potent antigen-presenting cells that initiate the primary immune response toward pathogens. In human blood, two functional distinct subsets of DCs, myeloid DCs (mDCs) and plasmacytoid DCs (pDCs), have been identified. mDCs and pDCs are shown to preferentially differentiate naive T cells into Th1 and Th2 cells, respectively. Thus, they link innate and adaptive immune defense against bacterial infections. To elucidate capacity of innate host defense against invasive bacteria, we investigated expression of TRLRs 2 and 4 on monocyte and number of subsets of DCs in peripheral blood from HD patients.

**Methods:** In 18 HD patients (mean age, 55 years) and 10 healthy controls (mean age, 43 years), we studied TLRs 2 and 4 expressions on monocyte and number of subsets of DCs in peripheral blood from HD patients.

**Results:** Frequency of TLR2 (17.1 ± 19.4% vs. 41.3 ± 8.9%; P = 0.014) and TLR4 (23.2 ± 14.0% vs. 55.2 ± 5.18%; P < 0.001) on monocytes was significantly decreased in HD patients compared with controls. While mDC counts (46.9 ± 27.7 vs. 66.7 ± 23.7 counts) were not different, pDC counts (15.4 ± 11.7 vs. 39.7 ± 15.4; p = 0.0012) were significantly decreased in HD patients, resulting in a significant increase of Dcm/Dcpc ratio (5.51 ± 5.55 vs. 1.85 ± 0.889; p = 0.032) in HD patients.

**Conclusions:** Reduced expression of TLRs 2 and 4 on monocytes and alteration of balance between two DC subsets may be involved in the predisposition to bacterial infections in HD patients.
serum phosphorus (sP), intracellular phosphorus ([P]) and 2.3 BPG enzyme ([2.3 BPG]) concentrations were measured before and after 1, 2, 3, 4, 5, 10, 30, 60 minutes of the HD initiation.

**Results:** There was no statistical significant difference in TPR between the 1st and 2nd HD session (282.5 ± 63.8 vs. 260.6 ± 57.2 mg, p=ns). The contribution of IPR to TPR was negative in the first 10 minutes in both HD sessions (-84.2 ± 20.3 and -81.8 ± 18.1 mg respectively, p=ns), while the contribution of the IPR to TPR was increased as time elapsed. The [P] and [2.3 BPG] remained almost unchanged during the 60 minutes of HD session.

**Conclusions:** a) the confirmation of the negative contribution of IPR to TPR in the first hour of HD session and b) the finding of an unchanged [P] concentrations at the same period does not reject the hypothesis of a simultaneously efflux and influx of phosphorus from intra to extracellular compartment.

**Introduction and Aims:**

The National Cholesterol Education Program-ATP III defined metabolic syndrome as the presence of any 3 of the following criteria: 1) abdominal obesity: waist circumference > 102 (or 90 cm in Asians) in men and waist circumference > 88 cm (or 80 cm in Asians) in women; 2) hypertriglyceridemia: TG ≥ 150 mg/dl; 3) low HDL-cholesterol levels: HDL-cholesterol < 40 mg/dl in man and HDL-cholesterol < 50 mg/dl in women; 4) hyperglycemia: fasting plasma glucose ≥ 110 mg/dl; and 5) high BP (SBP ≥ 130 mmHg or DBP ≥ 85 mmHg). Insulin resistance is an integral part of the metabolic syndrome. Insulin resistance and metabolic syndrome predisposes to chronic kidney disease. However, the determinants of insulin resistance and metabolic syndrome are not known in hemodialysis (HD) patients.

**Methods:** Insulin resistance was measured by the homeostasis model, HOMA-IR, and we studied 157 HD patients.

**Results:** The prevalence of metabolic syndrome was 46.5%. Patients with metabolic syndrome had higher HOMA-IR (5.6 ± 1 vs. 1.8 ± 0.3, P < 0.001), interdialytic weight gain (3.3 ± 0.2 vs. 3.0 ± 0.1 kg, P < 0.05) and intra-dialytic DBP drop (12.2 ± 7.3 ± 1.1 μg/dl, P < 0.05) and lower Kt/V (1.5 ± 0.0 vs. 1.5 ± 0.02, P < 0.05), serum creatinine (9.9 ± 0.3 vs. 10.4 ± 0.2 mg/dl, P < 0.05). The determinants of metabolic syndrome were: female, diabetes, HOMA-IR, cholesterol, interdialytic weight gain, magnesium and low Kt/V.

The risk of metabolic syndrome reached a plateau when HOMA-IR ≥ 1.0. The risk of metabolic syndrome was U-shaped with the nadir of magnesium at 2.4 mg/dl. The risk of metabolic syndrome was also U-shaped with the radial of Kt/V at 1.7. The determinants of HOMA-IR were: age, short duration of HD, HBsAg, triglyceride, low HDL-cholesterol, uric acid, ferritin, interdialytic drop in DBP and low PTH.

**Conclusions:** The prevalence of metabolic syndrome was much higher in HD patients than the general population (46.5% vs. 11.6%). The determinants of metabolic syndrome and HOMA-IR were different. Therefore, metabolic syndrome and insulin resistance are similar but distinct entities.

**Introduction and Aims:**

Haemodialysis transplant patients.

**Methods:** Patients who underwent renal transplant underwent pre transplant HRCT scan chest. The HRCT possibility of tuberculosis was suggested depending on the pattern of the parenchymal infiltrations, hilar adenopathy, pleural effusions, fibrotic strands or cavity formation. Detailed history pertaining to tuberculosis was taken and routine workup for identifying tuberculosis including sputum and early morning gastric aspirate for AFB, Mantoux, ESR. Anti-tb antibody, Chest X-ray and pleural fluid analysis were also performed. Patients with HRCT evidence of tuberculosis were treated with anti-tuberculous therapy for two months and HRCT Chest was repeated for follow up purposes.

**Results:** There were 60 patients-49 males and 11 females. Age group between 14-63 years. 13 patients had ESRD secondary to Diabetic nephropathy and 47 were due to nondiabetic renal diseases. 6 patients had radiological evidences of tuberculosis in 2 diabetic group and 4 in non diabetic group. Two out of six patients were treated for pulmonary tuberculosis in the past. The radiological lesions were upper lobe parenchymal infiltrations in 5 patients-2 had associated mild ipsilateral pleural effusions and 2 had associated parenchymal fibrotic strands. One patient had right upper lobe anterior segment nodule with right hilar lymphadenopathy.

Early morning gastric aspirate for AFB, Mantoux, Chest X-ray was negative in all patients. Pleural fluid aspirate in one patient revealed exudative effusion with lymphocytosis with positive PCR for tubercular antigens. All patients were given anti-tuberculous therapy and HRCT was repeated subsequently which revealed complete resolution of parenchymal infiltrations, hilar adenopathy, pulmonary nodule and pleural effusion. The patients continued to receive their full course of their ATT and underwent renal transplant.

**Conclusions:** The incidence of occult pulmonary tuberculosis in our study is 10% and are not picked up by conventional investigations in asymptomatic renal failure patients. As immunosuppression is going to aggravate these unidentified and untreated infections, proper identification of these lesions are mandatory, particularly in disease endemic areas. Hence we recommend HRCT scan of chest as a routine pre-transplant investigation in our pre transplant patients.
SP667 EXERCISE TOLERANCE IN PEDIATRIC PATIENTS ON REGULAR HEMODIALYSIS AND THE EFFECT OF L-CARNITINE

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Introduction and Aims: Renal failure patients undergoing chronic hemodialysis (HD) have severely impaired exercise tolerance. Carnitine homeostasis is abnormal in HD patients, leading in selected patients to carnitine depletion. Maximum ventilatory oxygen consumption (VO2max) which is the maximum rate that oxygen can be taken up and consumed is widely used to characterize exercise function. We aimed at determination of exercise capacity among the studied patients through non invasive exercise testing. Evaluation of carnitine status and the effect of its supplementation on the exercise performance among those patients.

Methods: The study was conducted in Children’s Hospital, Ain Shams University; it included 11 patients with end stage renal disease (ESRD) on regular HD in the Pediatric Dialysis Unit. Their mean age was 15.27±2.3.2 years. They were compared to 20 healthy control subjects, their age mean was 12.8±1.93 years. For all subjects assay of lipid profile and serum carnitine (enzymatic ultraviolet test) were done. All subjects underwent exercise testing by cardiopulmonary evaluation in the Chest Specialized Clinic, data obtained were exercise duration, VO2 max, VCO2/VO2 ratio and anerobic threshold. All patients received intravenous carnitine supplementation for 5 weeks, after which lipid profile and exercise testing were re-evaluated.

Results: see Table 1.

Conclusions: Pediatric patients with ESRD on regular HD have significant impairment in exercise tolerance. VO2max, AT and VCO2/VO2 ratio could all be considered useful, reproducible and non-invasive way of evaluation of exercise tolerance. Carnitine deficiency may be an important contributing factor to exercise intolerance. Carnitine therapy proved effective in improving exercise tolerance but not lipid profile in this study.

SP668 INTERDIALYTIC WEIGHT GAIN AND SURVIVAL IN HEMODIALYSIS PATIENTS

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Introduction and Aims: Interdialytic weight gain is usually used as an indicator of compliance to fluid restriction but may also be an index of protein and calories intake and indirectly of nutritional status.

The aim of this study is to assess the prognostic effect of interdialytic weight gain (IDWG) in survival and its relationship with nutritional status and blood pressure.

Methods: We retrospectively studied the IDWG of 171 patients in haemodialysis in our unit between January and June 2001. They were divided in quartiles according to age and we selected the patients in the two middle quartiles (n=85; 46-72 years old). These were further divided in 3 cohorts. According to IDWG % (group 1: < 3.6%; group 2: 3.6-5.1%; n=83; group 3: ≥ 5.1%, n=21). We analysed the following four years and compared the survival, hospitalisations, nutritional status, blood pressure, and dialytic efficiency between groups. Kaplan-Meier survival curves and ANOVA were used as statistical tools.

Conclusions: Elder patients have lower IDWG %. Protein intake is lower in patients with lower IDWG %, so these patients are at risk for developing malnutrition. Survival is influenced by interdialytic weight gain with higher mortality in outmost groups.

SP669 THE IMPAIRED IMMUNE RESPONSE TO HEPATITIS B VACCINATION IN CRF DIALYZED PATIENTS IS RELATED TO SERUM ZINC

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Introduction and Aims: Zinc deficiency causes abnormalities of immune response. In chronic hemodialysis (HD) and continues ambulatory peritoneal dialysis (CAPD) therapy, abnormalities in zinc metabolism as well as an impaired immune response to vaccination have been reported. Therefore, we performed a study to determine correlation between serum zinc level and immune response to hepatitis B vaccination.

Methods: A cross-sectional study of 95 CRF dialyzed patients (70 HD and 25 CAPD), (63 males and 32 females) with three dose regimens of vaccination against HBV was performed.

Results: Four months after vaccination, there were 34 (36%) patients with sufficient HBS Antibody response (HBS Ab> 10 mU/mL) and 61 (64%) patients with insufficient HBS antibody (HBS Ab< 10 mU/mL). The mean of serum zinc level was 23.5±3.87 μmol/L (13.20-33 μmol/L). The mean of serum zinc concentration was significantly higher in patients with sufficient HBS antibody level than patients with insufficient HBS antibody level (24.94±4.17 versus 22.15±1.46, P= 0.005). In logistic regression analysis, independent variable that correlated with sufficient HBS Ab level (≥ 10 mU/mL) were higher mean serum zinc level (P=0.006) and female gender (P=0.048). Factors entered into the logistic regression model however were found to be insignificant included dialysis type (HD versus CAPD), age ≥ 50 years versus age < 50, prescription of erythropoietin versus no prescription, diabetes mellitus as a cause of ESRD versus all other causes combined and serum albumin.

Conclusions: We conclude that the failure to respond to HBV vaccination in HD and CAPD patients are related to a significantly low level of serum zinc and male gender. However, further studies should be performed in order to establish these effects.

SP670 PAIN IN THE HAEMODIALYSIS POPULATION: INCIDENCE AND IMPACT ON QUALITY OF LIFE

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Introduction and Aims: Dialysis patients have a heavy burden of symptoms, including pain. This may be due to any number of underlying systemic diseases or may well be specific to chronic kidney disease (CKD). The aim of this study was to conduct a cross-sectional survey in all dialysis patients to establish the effects of pain and its impact on the quality of life.

Methods: A total of 100 patients on regular dialysis therapy in York district hospital were surveyed. The patients were asked to complete a pain assessment questionnaire to determine the pain intensity and its impact on their quality of life and to identify associated factors.

Results: Of the 100 patients surveyed, 70% reported pain. The intensity of the pain was mild in 40% of patients, moderate in 30% and severe in 30%. The most common types of pain were musculoskeletal (30%), neuropathic (20%), and abdominal (10%). The median duration of pain was 6 months. Pain negatively affected the patients' quality of life, with the majority reporting that pain interfered with their sleep, activities of daily living, and overall well-being. Significant correlations were found between pain intensity and age, duration of dialysis, and comorbid conditions.

Conclusions: Pain is a significant problem for dialysis patients, affecting their quality of life. Effective pain management is crucial to improve their overall well-being. Further research is needed to understand the underlying causes of pain and develop effective strategies for pain relief.
was to identify the prevalence, source and severity of pain, and its impact on quality of life.

**Methods:** All patients undergoing maintenance haemodialysis were given a questionnaire to examine aspects of pain and quality of life, which included the Short Form McGill Pain Questionnaire (SF-MPQ) and the Brief Pain Inventory-Short Form (BPI-SF). This was completed during haemodialysis sessions, with assistance from a member of the medical team if required.

**Results:** There was a return rate of approx. 60% of questionnaires (42/68). SF-MPQ: 73% of patients reported experiencing pain, with a mean pain score of 4.1/10 on the Visual Analogue Score (VAS). BPI-SF: 36% had pain on the day of questioning and 67% had experienced pain within the previous 24 hours. Of those reporting pain, on a scale of 1 to 10 (ranging from no pain to worst pain imaginable), the mean worst pain was 6.3, least pain 2.5 and average pain 4.4. At the time of questioning the mean pain score for everyone was 3.2.

**Pain relief:** 27% experienced no relief at all from pain. Of the remaining group, the average pain relief achieved from therapies used, expressed as a percentage, was only 46%.

**Source of pain:** Muscle cramps (26%), back pain (19%) and peripheral limb pain (26%) due to both vasculopathy and neuropathy were the commonest causes of pain.

**Quality of life:** In the previous 24 hours, 66% felt pain impacted on their daily activities (mean 5.8/10), 58% on their mood (mean 5.2), 72% on walking (mean 6.0), 72% on their work (mean 6.0) and 52% on relations with other people (mean 5.7). 61% reported sleep disturbance (mean 5.1) whilst 68% felt it impacted on their enjoyment of life (mean 5.6).

**Conclusions:** Recurrent and often severe pain is very prevalent in the haemodialysis population. It is frequently under reported, under diagnosed and under treated. It has a significant impact on many aspects of daily living which can ultimately lead to a reduction in enjoyment and quality of life.

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**PARATHYROID GLANDS HYPERPLASIA AND CARDIOVASCULAR RISK IN HEMODIALYSIS PATIENTS**

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**Introduction and Aims:** In the past 20 years, epidemiological features of patients on maintenance haemodialysis (MHD) are changed: most of new patients entering MHD are old subjects with vascular or diabetic nephropathy, and they start MHD after a short conservative therapy period. Increased intact parathyroid hormone (iPTH) secretion and parathyroid glands (PTGs) hyperplasia progress together with end stage renal disease (ESRD) age. Secondary hyperparathyroidism (sHPT) severity influences cardiovascular (CV) morbidity and the success of treatments for disorders of mineral metabolism. High-resolution ultrasound (US) is very useful in detection of PTGs size and shape and in the management of sHPT. Aim of the study is to evaluate the prevalence of PTGs diffuse and nodular hyperplasia in MHD patients and to correlate PTGs hyperplasia with CV events.

**Methods:** Using US, we studied 75 patients (age 64±14 years). We considered: ESRD cause, ESRD age (non-dialytic, dialytic), pharmacological treatments for disorders of mineral metabolism, serum calcium (sCa), phosphorus (sP), calcium x phosphorus product (Ca X P) and iPTH. PTGs diffuse hyperplasia was suspected when PTGs diameter was >0.5 cm, and nodular hyperplasia when PTGs diameter was >1 cm. We registered CV events at 1 year of follow-up.

**Results:** We divided our cohort in 2 groups based on the absence (G1) or presence (G2) of PTGs hyperplasia. In both groups, 85% of patients were under treatment for disorders of mineral metabolism with one or more drugs, in several different associations. Characteristics of G1 (54 patients): age 67±13 years, conservative treatment period 97±84 months, dialysis duration 61±77 months, sCa 8.9±1.9 mg/dl, sP 4.6±1.3 mg/dl, CaXP 42.3±12.2 mg²/dl², iPTH 230.0±204.2 pg/ml, iPTH was greater than 300 pg/ml in 12/54 (22%) patients. Characteristics of G2 (21 patients): age 56±12 years, conservative treatment period 163±104 months, dialysis duration 101±67 months, sCa 9.5±0.8 mg/dl, sP 4.9±1.4 mg/dl, CaXP 46.4±13.5 mg²/dl², iPTH 609.9±457.8 pg/ml, iPTH was greater than 300 pg/ml in 16/21 (76%) patients, 13/21 (46%) patients had PTGs diffuse hyperplasia and 8/21 (38%) had nodular hyperplasia. PTGs volume was from 260 to 1337 mm³. Vascular and diabetic nephropathy were present in 46% patients in G1 and 18% patients in G2. G1 and G2 had a significant difference between age (p<0.001), conservative treatment period (p<0.006), dialysis duration (p<0.04) and iPTH (p<0.005). At 1 year we registered 13 non-fatal CV events: 8 in G1 and 5 in G2. PTGs hyperplasia was associated with a CV relative risk increased (RR=1.6).

**Conclusions:** Prevalences of PTGs hyperplasia and nodular hyperplasia are respectively 28% and 10.6%. Nodular hyperplasia is correlated with ESRD duration, so our prevalence of sHPT might be reduced because most of incident MHD patients are old subjects with vascular or diabetic nephropathy, and they start MHD after a short conservative treatment period. US balance of PTGs becomes very important for a rational approach to treatment of disorders of mineral metabolism, in the final attempt to reduce CV morbidity.
SP673 SEXUAL DISORDERS AND QUALITY OF LIFE IN PATIENTS ON DIALYSIS
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Introduction and Aims: Chronic renal failure (CRF) results in sexual dysfunctions, poorly understood in dialysed patients, which could influence satisfaction of life, and add to the psychological problems these patients present. The aim of the study was to measure the prevalence of various sexual disorders, and the impact they have on the health-related quality of life in haemodialysed patients aged 20 – 60.

Methods: This multi-center, observational, questionnaire-based study grouped 112 patients (69 males, and 43 females) assessed, concurrently, using International Index of Erectile Function (IIEF-5), Arizona Sexual Experience Scale, Mell-Krat Scale, Sexual Pathology Scale, Beck Depression Inventory, Self-Evaluation Questionnaire, Quality of Life Questionnaire (SF-36) self-completed or obtained during one-on-one conversation.

Results: The libido was decreased in 48.8% of women, and 72.4% of men. The weakening of sexual responsiveness was universal (only 6.9% of women have reached an appropriate score in Mell-Krat Scale). The dyspareunia (23.4%), vaginismus (occasional 16.3%, regular 4.6%), and erectile dysfunction (51.8%) were common. The incidence of depression was 74.5% in women, and 66% in men, and higher in those with sexual dysfunctions. Patients perceived their health as bad and deteriorating, and were extremely concerned with their ability to work, as indicated by the lowest scores for these two determinants of quality of life (22% and 35%, respectively). These findings were less expressed in those who had lived for more than one year with a renal transplant.

Conclusions: We conclude that sexual and psychological problems in dialysed patients are strongly under-evaluated by medical teams, and along with the disability caused by general somatic factors, significantly affect these patients’ relationships and quality of life.

SP674 ARE PATIENTS DIALYSING AT SATELLITE RENAL UNITS (SUs) IN THE UK A SELECTED MORE STABLE GROUP OF HD PATIENTS WHEN COMPARED WITH THE MAIN UNIT (MU)?
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Introduction and Aims: The UK Renal Registry shows wide variation between renal centres in the achievement of Standards for laboratory parameters. This variation between centres may be related to differing selection pressures between MUs and SUs. We compared the variability of various laboratory parameters as a surrogate for patient stability in HD patients treated in MUs and SUs.

Methods: Only MUs with SUs were selected for this analysis. Patients were assigned to a category of MU and SU on basis of URR at day 90 after start of dialysis. Those patients starting dialysis between 1998 and 2004 were included in the analysis if they had minimum 8 quarters data. 1615 patients from 19 MUs and 544 patients from 29 associated SUs were studied. Following variances were calculated (a) Between MUs and between SUs, (b) Between patients at MUs and between patients at SUs.

Results: Variance between MUs and between SUs was significantly different. Between patient variability at MUs was significantly greater than between patient variability at SUs for Hb (p=0.009), ferritin (p=0.001), albumin (p=0.003), phosphate (p=0.001), URR (p=0.001) and bicarbonate (p=0.001). Consent: We have shown that there is significantly greater ‘between patient variability’ in laboratory data from MUs compared to SUs. This supports the hypothesis that there are less stable patients at main units which may require more support during HD treatment. This also has implications for funding of MUs when compared with SUs and comparative audit of outcomes and survival.

SP675 REMOVAL OF SERUM FREE LIGHT CHAINS BY HAEMODIALYSIS IN PATIENTS WITH MULTIPLE MYELOMA
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Introduction and Aims: Renal failure is a common complication of multiple myeloma (MM) and is associated with a poor outcome. The cast nephropathy which results from the excess free light chain (FLC) production is the main cause of renal failure in MM. There is intense interest in whether rapid normalisation of serum FLC by plasma exchange (PE) and/or haemodialysis can improve renal outcomes. We have previously demonstrated that haemodialysis (HD) using high flux membranes removes serum FLC in a non-MM chronic HD population. The purpose of this study was to demonstrate the ability of HD to remove FLC in patients with MM.

Methods: Four patients who presented with dialysis dependent renal failure and MM had FLC levels measured in serum and dialysate fluid at 15 min intervals through the course of consecutive four hour dialysis sessions. Three membranes were studied: (i) B Braun Hi Pes 1.8 High Flux Polysulfone; (ii) Toray Super Flux BK-F 2.1 Poly-methy-methacrylate; (iii) Gambro Protein Permeable HCO 1100 Polyamide. FLC measurements were performed using the nephelometric immunoassay FREEELITE (The Binding Site). Using these measurements we used a mathematical model to analyse removal of FLC in MM by HD.

Results: FLC were demonstrated in the dialysate fluid levels ranging from 1mg/L to 650mg/L. The efficiency of dialysis to reduce serum FLC concentration was dependent on the membrane. The B Braun Hi Pes 1.8 reduced the serum levels on average by 459mg/L, the Toray BK-F 2.1 by 1306mg/L and the Gambro HCO 1100 by 5395mg/L per dialysis session. Figure 1 shows reductions in sFLC levels over 3 dialysis sessions in a patient with a Kappa MM, using the Toray membrane. Figure 2 shows the sFLC reduction in a patient with a IgG Lambda MM on a dialysis session using the Gambro HCO with the corresponding dialysate concentrations. The Gambro HCO has a sieving coefficient of 0.02 for the Lambda light chains and a clearance of 14ml/min. The clinical data was then used in a mathematical model which indicated that extended daily HD decreases FLC to non toxic levels more rapidly a standard PE prescription (3 vs 21 days).

Fig. 1. VF serum clearance summaries.
Free light chain removal from serum by haemofiltration and haemodialysis: a comparison of dialysis membranes in vitro

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Introduction and Aims: Many patients with multiple myeloma (MM) present with renal impairment, mostly caused by cast nephropathy from the excess monoclonal serum free light chains (sFLC). These patients have a poor prognosis. Interest has focused on methods of rapidly removing sFLC in an attempt to prevent ongoing renal damage. Variable results have been obtained using plasmaphoresis for sFLC removal in MM. We hypothesised that haemodialysis (HD) would be more efficient at removing sFLC, particularly the high-flux and the new super-flux dialysers that allow the removal of middle-sized molecules. The aim of this study was to investigate the capacity of several commercially available dialysers to remove sFLC in vitro.

Methods: We compared: B Braun HiPES18, Asahi APS-1050, Nikkiso FLX18GWS, Idemsa 200 MHP, Toray BK21-F and Toray BG2.1U and the Gamro HC100 dialyzers. Efficiency of sFLC removal was determined in vitro by recirculating serum containing 1g/L of monoclonal light chains. The haemofiltration (HF) was stopped when production of ultrafiltrate (UF) fluid ceased; the dialysis was stopped after 4 hours. The filtered or dialysed serum and UF were analysed for sFLC using the nephelometric Freelite™ assay (The Binding Site Ltd, UK).

Results: All dialysers were able to remove sFLC from serum with k light chains removed more easily than λ (Table 1). The B Braun dialyser showed the least sFLC clearance (54% and 39% for k and λ respectively) whilst the Toray BK model had the best for both- and λ (88% and 73% respectively). The super-flux Toray BG model and the high-flux Asahi both cleared 71% of k, but the Asahi was more effective at λ removal (65% compared with 41%) and a significant proportion was removed to the UF (30% of k and 18% of λ). The Nikkiso and Toray dialysers showed high sFLC clearance but with only small quantities in the UF, suggesting that the adsorptive properties of these membranes are responsible for the substantial clearance demonstrated. In vitro dialysis experiments on 3 of the membranes broadly supported the data obtained from the filtration. After dialysis, 88%, 82% and 96% of k and 62%, 78% and 94% of λ removed by the B Braun, Toray BK and Gambro dialyzers respectively.

Conclusions: We have demonstrated in vitro the ability of super-flux dialysers to effectively clear sFLC. Further research now needs to be carried out to determine whether these membranes can be used to maximise sFLC removal in patients with MM and acute renal failure.

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Conclusions: Inequality to access RRT among Low income countries are evident. Nephrologists are responsible for correction by invention of more cheap but with good quality method of bloodpurification.