What has been causing this impairment in long-term treatment remains to be investigated.

MP480 PERITONEAL TRANSPORT MONITORIZATION WITH PET 3.86%, CORRECTED SODIUM SEIVING AND CA125 APPEARANCE RATE

Anabela Rodrigues[1], Fernanda Bravo[2], Jose C. Oliveira[2], Isabel Fonseca[1], Antonio Cabrita[1]. [1]*Neprology, HGSA, Porto, Portugal;* [2]*Clinical Pathology, HGSA, Porto, Portugal*

ISPD Committee on Ultrafiltration Failure has proposed PET 3.86% for evaluation of peritoneal membrane transport. Krediet and collaborators developed a model for diffusion correction of sodium sieving and their reference values were recently published. The aim of this study was to evaluate the results of PET 3.86% in our PD Unit using the simplified Garred method for MTAC creatinine calculation and Krediet's group model for diffusion sodium sieving correction. CA125 appearance rate was also systematically measured.

A total of 104 PETs tests (2L, 3.86% glucose solution) were analysed. After excluding PETs performed in patients with acquired ultrafiltration failure (UFF), data on 93 PETs, reported to stable patients with median duration of PD of 13 months (range 1.3 - 91) are presented.

Patients were classified according to mean D/Pcreat ±1SD: 13(13%)low transporters (D/Pcreat <0.63); 32 (34%)low-average (D/Pcreat 0.63-0.73); 31 (33%)high average (D/Pcreat 0.73-0.83) and 16 (17%) high transporters (D/Pcreat >83).

Comparing PETs from stable patients with those with UFF, differences were all strongly significant.

Tipe I UFF was diagnosed in all studied cases of UFF. Absent dip as a marker of Type IV UFF was coexistent in 9/11 PETs.

PET 3.86% in stable patients (values reported as median, range, 95%CI)

PET Drained volume (mL)	2800	2300-3400	2770-2866
MTACcreat	8,9	1,5-24,5	8,8-11
D/P creat	0,73	0,38-0,98	0,71-0,75
D/D0gluc	0,29	0,15-0,39	0,28-0,30
Corrected D/PNa60	0,77	0,61-0,87	0,75-0,78
Corrected sodium Dip	0,16	0,04-0,28	0,15-0,17
CA125 appearance rate U/min	132	18-459	130-173

Comparison of PET 3.86% variables in stable and UFF patients (mean ±SD)

	Stable	UFF
MTACcreat	9.7±4.9	23.7±10
D/Pcreat	0.73±0.10	0.90±0.07
Corrected sodium Dip	0.16±0.05	0.06±0.03
CA125 appearance rate U/min	152±99	72±62

Conclusion: We validated in our PD population the discriminative value of PET 3,86% with corrected sodium sieving for peritoneal transport monitorization. This gives a better insight of severity and type of UFF. Measurement of CA125 appearance rate gives added information on peritoneal membrane status and is consistently lower in UFF patients.

MP481 HYPOKALEMIA IN PATIENTS UNDERGOING CAPD

Stamatina Papakonstantinou, Ioannis Tsouchnikas, Evangelia Dounousi, Kyriakos Ioannou, Xanthopoulou Kyriaki, Apostolos Kelesidis, Nikolaos Kotzadamis, Dimitrios Tsakiris. *Department of Nephrology, General Hospital of Veria, Veria, Greece*

Although CAPD in routine doses does not provide sufficient potassium (K^+) clearance, the majority of CAPD patients maintain eukaliaemia, under a rather unrestricted K^+ diet. Despite this, hypokalaemia (hypoK^+) is a common disorder during the course of CAPD, as reported by a limited number of studies. The aim of this retrospective study was to examine the prevalence of hypoK^+ and identify possible risk factors in our CAPD patients.

We recorded the presence of hypoK^+, in 45 CAPD patients who were alive during the period 1/1/2003-1/11/2003 and had been on CAPD for at least 2 months. HypoK^+ was defined as serum K^+ less than 3.5 mEq/l, for two consecutive visits in our clinic persisting for at least two months. Serum K^+ values, calcium, phosphate (P), albumin, intact parathyroid hormone (PTH) levels, and the duration and severity of hypoK^+ were recorded, along with age, sex, primary disease, duration of CAPD and the administered PD dose. All the patients had a peritoneal equilibrium test (PET) during the first two months and yearly thereafter.

The mean age of the 45 patients was 66 ±16 years (range, 16-89), 23 were males and 22 females, 13 patients (29%) were diabetics and the mean duration of CAPD was 30 ± 22 months (range, 3 - 77). The PET showed that 67% were high and high average and 33% low average transporters. The mean Kt/V was 2.14 ± 0.68 (range, 1.12-4.18).

Twenty one patients (47%) presented at least one episode of hypoK^+ (group A). These patients were compared with those who had normal serum K^+ over their course in CAPD (group B, n=24). In group A the mean serum K^+ during the episode of hypoK^+ was 3.1 mEq/l (range, 2.4-3.4), hypoK^+ occurred at 20 ± 21 months after CAPD had started (range, 2 - 64) and the mean duration of hypoK^+ was rather extended for 5 ± 4 months, despite therapeutic intervention consisting mainly in prescribing potassium enriched PD solutions.

Patients in group A were significantly older 71 ± 11 vs 61 ± 19 ($p < 0.05$), and had significantly lower P levels at the start of CAPD compared to group B (4.45 ± 1.18 mg % vs. 5.21 ± 1.04 mg %, $p < 0.05$). Furthermore, patients in group A during the episode of hypoK^+ were presented with statistically lower levels of serum P (3.9 ± 1.6 mg % vs. 5.05 ±1.14 mg %, $p < 0.05$) and serum albumin (3.04 ± 0.61 g % vs. 3.5 ± 0.54 g %, $p < 0.05$) compared to those of group B at the respective time of presentation of hypoK^+. With regards to comparison of PET results there were more high or high average transporters in group A compared to group B (71% vs 46%, $p < 0.05$). The difference in sex, incidence of diabetes, CAPD duration, peritoneal dialysis adequacy (Kt/V), and the levels of serum K^+, calcium, albumin and PTH at the start of CAPD was not significant between the two groups.

In conclusion, hypoK^+ appears to be a very frequent complication in CAPD patients. Elderly and malnourished patients are susceptible particularly when they are high and high average transporters. The trend to increase the adequacy of peritoneal dialysis might raise the prevalence and the severity of hypoK^+, and we suggest that elderly and malnourished CAPD patients should be closely monitored for hypoK^+ warrant the routine use of potassium enriched PD solutions.

MP482 PREDIALYTIC PREDICTION OF PERITONEAL MEMBRANE TRANSPORT IN UREMIC PATIENTS ON CONTINUOUS AMBULATORY PERITONEAL DIALYSIS USING ARTIFICIAL NEURAL NETWORK

Jainn-Shiun Chiu[1], Chee-Fah Chong[2], Yu-Chuan Li[3], Bor-Ching Huang[4], Shih-Hua Lin[1]. [1]*Division of Nephrology, Department of Medicine, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan, Taiwan;* [2]*Emergency Department, Shin Kong Wu Ho-Su Memorial Hospital, Taipei, Taiwan, Taiwan;* [3]*Graduate Institute of Medical Informatics, Taipei Medical University, Taipei, Taiwan, Taiwan;* [4]*Health Station of Shihmen Township, Health Bureau of Taipei County, Taipei, Taiwan, Taiwan*

Increased peritoneal membrane transport is associated with morbidity and mortality in continuous ambulatory peritoneal dialysis (CAPD) patients. Accurate prediction of the peritoneal membrane transport characteristics utilizing predialytic parameters will guide the therapeutic protocol adequately. For this purpose, we developed and internally validated an artificial neural network (ANN) to predict the type of peritoneal membrane transport.

We retrospectively analyzed a 5-year CAPD database with a final study population of 104 uremic patients (48 male and 56 female, age 48.8 ± 15.3). The predialytic parameters including demographic characteristics, associated diseases, blood and urinary biochemistries were recorded as independent (predictive) variables. The dependent (outcome) variable was dichotomous, either group H (high and high average transporters, n = 53) or group L (low average and low transporters, n = 51). A standard peritoneal equilibration test was used as golden test. Three different mathematical models of ANN, namely linear, radial basis function (RBF) and multilayer perceptron (MLP) networks were tested and the results were evaluated using the receiver-operating characteristics (ROC) curve analysis. The best simultaneous sensitivity and specificity were calculated and the discriminating power of each model is also represented by the area under the ROC curve.

The linear model had a (sensitivity, specificity) of (54%, 73%), compared to (58%, 69%) from the RBF model and (73%, 82%) from the MLP model. The area under the ROC curve is greatest for the MLP model (0.808), followed by the RBF (0.705) and the linear (0.646) models. The MLP model also has the highest best simultaneous sensitivity and specificity and the best calibration.

ANN can accurately predict the type of peritoneal membrane transport in CAPD candidates and may be useful for risk stratification of these patients.

MP483 HIGHLY SELECT CAPD PATIENTS INFLUENCE THE PREVALENCE OF HIGH TRANSPORTERS

Jyh-Chang Hwang, Jiann-Renn Lin, Jen-An Chen, Chum-Ting Wang. *Nephrology, Chi Mei Foundation Hospital, Tainan, Taiwan*

The association of high transporters (HT) in CAPD patients with high mortality rates was well established. The cardiovascular risks of diabetic mellitus (DM) and old age were also higher in chronic dialysis patients. The aim of this study was to evaluate the changes in distribution of HT if those of DM and/or over age 60 were completely excluded. Totally 178 patients who entered the CAPD program from Nov. 1992 to Mar. 2002 at our center were separated into two stages: non-select (Non-S) stage: Nov. 1992 to Jun. 1998; and highly select (H-S) stage: Aug. 1998 to Mar. 2002. The indication criteria for the H-S stage were: non-DM and less than age 60 at the initiation of CAPD treatment. Patients in the Non-S stage (n=93; M/F: 52/41) were older (51.9 ± 15.2 vs. 42.2 ± 12.4, $p<0.001$) than those in the H-S stage (n=85; M/F: 32/53). Diabetics accounted for 33% (31/93) in the Non-S stage. The mean value of 4th hour D/P Cr ratio in the Non-S stage was higher than those in the H-S stage (0.66 ± 0.13 vs. 0.57 ± 0.10, $p<0.001$). High transporters accounted for 14% in the Non-S stage, and 2% in the H-S stage. Only 2 HT were noted in the H-S stage (one in year 2000 and the other in 2002). Patients with DM and/or over age 60 in the Non-S stage (n=47) were older than those without these two criteria (n=46) in same stage (63.1 ± 9.2 vs. 40.5 ± 11.1, $p<0.001$). The mean 4th hour D/P Cr ratio of the former group was also higher (0.69 ± 0.14 vs. 0.62 ± 0.11, $p=0.019$) than those of the latter group. Patients in the Non-S stage had a poorer cumulative survival rate than those in the H-S stage ($p=0.033$). Concerning the four-year treatment time as a cutoff point, those patients expiring (n=40) had higher prevalence of DM (60% vs. 9%) and 4th hour D/P ratio (0.70 ± 0.13 vs. 0.61 ± 0.11, $p=0.007$) than those still alive (n=34) in the Non-S stage. In conclusion, we found that after the patients with DM and old age were excluded, the percentage of HT in CAPD patients was significantly declined, and this led to a better cumulative survival rate. It signifies the correlation among high PET and DM and old age.

MP484 FLUID AND SODIUM REMOVAL IN RELATION TO PERITONEAL TRANSPORT IN CAPD PATIENTS

Oskar Zakiyanov[1], Vladimira Bednarova[1], Vitezslav Kriha[2], Sylvie Sulkova[1], Rita Sakova[1], Vladimir Polakovic[1]. [1]*Department of Internal Medicine Strahov, 1st Faculty of Medicine of the Charles University, Prague, Czech Republic;* [2]*Department of Physics, Czech Technical University, Faculty of Electrical Engineering, Prague, Czech Republic*

Sodium and water retention are common in peritoneal dialysis patients and contribute to cardiovascular disease, which is the main cause of death.

Both peritoneal transport characteristics as well as residual renal function are related to the fluid state in CAPD patients. The aim of this study was to determine the effect of fluid and sodium removal on fluid status in relation to peritoneal transport characteristics in stable CAPD patients. 107 patients were stratified into three groups H (high+high average, n=19); LA (low average, n=38); L (low, n=50). Serum sodium, albumin, aldosteron, total, extra-cellular, intra-cellar body water (TBW, ECF, ICF), and fat free mass (FFM) multifrequency bioimpedance (Xitron); 24-hour ultrafiltration (UF) and total sodium losses were measured in each patient.

Results: There were no significant differences in Kt/V, renal creatinine clearance, ICF, and total sodium losses. A significant relationship was found between net UF and peritoneal sodium losses $r=0.84$, $p<0.001$ in all studied groups.

The net UF was lower in H vs. L ($p=0.002$). TBW and ECF were higher in H vs. L, and in LA vs. L (both $p<0.05$). Sodium renal losses were higher in H vs. L ($p=0.004$), and LA vs. L ($p=0.002$) patients. Serum sodium ($p=0.005$) was higher, while aldosteron (0.02) was lower in group H. Despite lower serum albumin ($p=0.0003$) in H patients, a higher FFM was found ($p=0.02$) in this group.

In conclusion, no significant differences in total sodium removal were found in studied groups. Fluid and sodium removal in high transporters is lower by peritoneal dialysis and optimal fluid and sodium status are depended on residual renal function.

MP485 RELATIONSHIP BETWEEN PERITONEAL MEMBRANE SOLUTE TRANSPORT CHARACTERISTICS AND CYSTATIN C SERUM CONCENTRATIONS IN CAPD PATIENTS

Maria Majdan[1,2], Ewa Bober[2], Anna Orlowska[3]. [1]*Department of Rheumatology, University Medical School, Lublin, Poland;* [2]*Department of Nephrology, University Medical School, Lublin, Poland;* [3]*Department of Nephrology, Public Hospital, Sandomierz, Poland*

Cystatin C belongs to a group of serum low molecular weight proteins (LMWP). It freely crosses the glomerular membrane to become reabsorbed and metabolized in the tubules.Recently it has been suggested that serum cystatin C concentration(conc.) is a sensitive indicator of subclinical renal dysfunction. However there is very little data concerning cystatin C conc. in patients (pts) with advanced kidney disease and in pts on dialysis treatment.Taking into account that cystatin C belongs to LMWP we assumed that peritoneal solute transport characteristics have an influence on cystatin C conc. in CAPD pts. In our study we tried to find relationship between serum cystatinC conc. and peritoneal membrane transport solute characteristics in a group of CAPD pts.

The study was conducted in 33 (20M,13 F) CAPD pts who were stable,without peritonitis, their mean age was 49.5 ± 17.1 years (range 21-79), mean peritoneal dialysis duration 26.6 ± 20.7months (range 4-72), with mean daily diuresis 790 ± 656 ml (range0-2500). Standard peritoneal equilibration test (sPET) was done in all pts.Creatinine (enzymatic method) and cystatin C (using immunonephelometry) serum conc. were measured at the same time. According to the sPET values pts were divided into two groups: group1(high/highaverage transporters,n=21) and group2 (low/low/average transporters, n=12). Relationships between parameters were evaluated using linear regression analysis. Cystatin C serum conc. in all CAPD pts were markedly increased. Pts in group 1 had statistically significant lower cystatinC conc.than pts in group 2 (8.1 ± 2.3 vs 12.2 ± 3.8, $p<0.01$). The differences in mean daily diuresis in both groups of pts were not statistically significant.Correlations: we did not find statistically significant correlations between cystatin C and creatinine serum conc. and between cystatin C serum conc. and daily diuresis. We found statistically significant positive correlation between D4/D0 for glucose and cystatin C($r=0.41$,$p<0.01$) and significant negative correlation between D4/P for creatinine and cystatin C ($r=-0.38$, $p=0.02$).

We concluded that cystatin C serum conc. in pts on CAPD is markedly increased and mainly depends on peritoneal membrane solute transport characteristics.

MP486 IMPAIRED DIFFERENTIATION OF PERITONEAL MACROPHAGES INTO DENDRITIC CELLS IN VITRO IN PATIENTS ON PROLONGED PERITONEAL DIALYSIS

Miodrag Colic[1], Djoko Maksic[2], Sasa Vasilijic[1], Ivana Majstorovic[1], Slavko Mojsilovic[1], Biljana Bufan[1]. [1]*Institute for Medical Research, Military Medical Academy, Belgrade, Serbia, Yugoslavia;* [2]*Clinic for Nephrology, Military Medical Academy, Belgrade, Serbia, Yugoslavia*

Continuous ambulatory peritoneal dialysis (CAPD) is a therapy modality of the end-stage renal disease. However, it is frequently followed by damage of peritoneal membrane and peritoneal cells (PC), development of peritonitis and other complications due to impairment of general and local