Q5: Dialysis: nutritional status

HYPERMAGNESEMIA IN CHRONIC DIALYSIS PATIENTS: RELATIONS TO DIALYSATE MAGNESIUM AND SERUM ALBUMIN CONCENTRATIONS

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This study was to evaluate the difference of magnesium (Mg) concentration between hemodialysis (HD) and continuous ambulatory peritoneal dialysis (CAPD) patients since the Mg concentrations were different between HD (1.5mEq/L, Erica, NJ) and CAPD (0.5mEq/L, Baxter, IL) dialysates routinely used in our center. We also tried to evaluate the relationship between serum Mg and albumin (Alb) concentrations, and the effects of serum Mg concentration on the HD patients' survival. Two hundred and ninety HD patients (156 males and 134 females, aged 56.3±13.3 years, diabetic nephropathy [DN]=34%) and 22 CAPD patients (9 males and 13 females, aged 48.6±12.6 years, DN=14%) were enrolled in the study. Serum magnesium was quantitatively determined by using a colorimetric assay.
One session of HD did not alter serum Mg concentration significantly (preHD:PostHD=3.50±0.54mg/dl vs. 3.56±0.50mg/dl, p=0.07). In HD patients, patients with DN had lower Mg level than those were not (3.35± 0.53mg/dL vs. 3.58±0.53mg/dL, p<0.001). The Mg concentration of HD patients was significantly higher than that of CAPD patients (HD: CAPD = 3.50±0.54mg/dl vs. 2.94±0.68mg/dl, p<0.001), even after excluding DN patients' data (HD:CAPD = 3.52±0.44mg/dl vs. 3.01±0.69mg/dl, p<0.001). Serum Mg concentration positively correlate with serum albumin in both HD (Mg=0.34 × Alb +2.16; r=0.29, p<0001) and CAPD patients (Mg=0.53 × Alb +0.92; r=0.44, p=0.04). In HD patients, those with higher Mg levels (upper quartile, n=73, DN=27%) had higher serum Alb concentration (4.09±0.34 vs. 3.75±0.53, p<0.001) and better survival rate (p=0.025) than those with lower Mg level (lowest quartile, n=73, DN=49%).
HD patients had higher serum Mg concentration than CAPD patients in our center, supposed to be caused by higher HD dialysate Mg content. DN patients had lower serum Mg and Alb concentrations, may be due to less intake and poor nutrition. Since serum albumin level positively paralleled to serum Mg concentrations in both HD and CAPD patients, patients with higher Mg level, maybe due to better nutritional status, had less mortality rate. We concluded that dialysate Mg concentration and nutritional intake are two major determinants for uremic patients' serum Mg concentration.

ADEQUACY AND NUTRITIONAL STATUS IN DIABETIC PATIENTS ON PERITONEAL DIALYSIS

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Malnutrition is common in patients (pts) on continuous ambulatory peritoneal dialysis (CAPD) and its etiology is multifactorial. Adequacy and nutritional status are associated with outcome in dialysis pts.
The aim of the study was to evaluate adequacy and nutritional status through common biochemical and anthropometric markers in a group of pts affected by diabetes mellitus type I or II (DM) at the beginning and after 6 months of CAPD treatment. We examined 8 diabeticians and 25 pts affected by end-stage renal disease (ESRD) of other leading cause. We evaluated: Kt/V, weekly creatinine clearance (Ccr, l/m2), residual renal function (RRF, l/m2/week), normalized protein catabolic rate (nPCR, g/kg/day), hemoglobin (Hb, g/l), total serum protein (TP, g/l), serum albumin (SA, g/l), serum transferrin (µg/l), cholesterol (mmol/l), triceps skinfold thickness (TN), biceps skinfold thickness (BN), midarm muscle circumference (MAMC), percentage of body fat (%F), body weight, body mass index (BMI), subjective global assessment score (SGA).
Pts affected by DM started CAPD program with higher RRF, and they had higher Kt/V and Ccr during the follow-up, in spite of lower nPCR, indicating a lower protein intake in these pts: differences were not statistically significant. Biochemistry was better in DM pts at the beginning, but TP and SA declined and they were lower in DM pts after 6 months of CAPD treatment: differences were not significant. Anthropometric parameters were higher in DM pts at the beginning; 6 months later they were the following:

	Diabetes mell.	Other cause of ESRD
TN (mm)	17.3±6.9	9.6±4.0*
BN (mm)	8.7±2.6	5.8±2.4**
MAMC (cm)	21.9±2.0	21.0±3.3
%F	27.9±8.3	21.1±5.3*
BMI (kg/m2)	25.8±2.6	23.5±4.1
Weight (kg)	68.2±9.6	66.3±11.8

*: $p < 0.05$; **: $p < 0.001$
SGA score was slightly higher in DM pts during the follow-up period.
In conclusion: pts affected by DM performed adequate dialysis and they improved anthropometric parameters during the follow-up. CAPD is a satisfactory mode of therapy for ESRD pts affected by DM.

EFFECT OF DAILY FOOD INTAKE LEVEL ON THE NUTRITIONAL STATUS IN HEMODIALYZED PATIENTS

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In patients on chronic hemodialysis (HD), the daily level of nutrient intake can be variable. To evaluate the independent effect of daily protein-calorie level on the nutritional status, a one-year prospective study was carried out in HD patients (n=27) with no risk factor for malnutrition. Every 4 months, we evaluated the daily values of protein nitrogen appearance (PNAd), protein and calorie intake from dietary diaries (DPI, DCI) and weight gain (WGd) for 7 consecutive days, and the biochemical and bioimpedance (BIA) markers of nutritional status. During the study, Kt/V was always > 1.2. The mean interdialytic PNA was constantly > 1.1 g/kg body wt/day; however, the daily assessment of DPI and DCI revealed a significant reduction (20 to 30%) of both protein and calorie intakes in the 3rd day of the long interdialytic interval (L3), that was related to the fear of excessive weight gain. DPI values were confirmed by PNAd. To properly evaluate the impact on the nutritional status, we selected the patients that constantly showed, during the entire follow-up, time-averaged values of DPI and DCI in L3 < 0.8 g and 25 kcal/kg/day, respectively (LOW group, n=8). The one-year nutritional outcome in LOW was therefore compared with that of the other patients with normal intake (NOR group, n=19). Body weight, that was stable in NOR, decreased from 68.0±5.5 to 65.8±5.9 kg (p<0.05) in LOW. This was associated with a decline of lean mass, as testified by the significant reduction of serum creatinine (from 9.1±1.1 to 8.0±1.2 mg/dl) and albumin (from 3.98±0.08 to 3.66±0.12 g/dl). Similarly, BIA-derived reactance and phase angle decreased in LOW. In the two groups, Kt/V, blood pressure, serum bicarbonate and inflammatory indexes did not differ during the study. WGd at L3 was constantly < 1% in LOW and > 1% in NOR.To conclude, well-nourished HD patients can develop a persistent spontaneous reduction of protein-calorie intake in the 3rd day of the long interdialytic period, which is indicated by a low value of daily WG but not detected by standard interdialytic PNA. This abnormal eating behavior, even if limited to a single day of the week, leads to a moderate impairment of nutritional status.

BIOELECTRICAL IMPEDANCE ANALYSIS IN DIALYSIS PATIENTS: COMPARISONS TO THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III.

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Bioelectrical impedance (BEI) parameters of resistance (R), reactance (XC) and phase angle (PA) closely correlate with total body water (TBW), body cell mass (BCM) and fat free mass (FFM) content. We compared BEI values obtained in dialysis (ESRD) patients (N=197) using single frequency analysis (50 kHz) to those obtained in the general population (NHANES III) matched by age, sex, race and body mass index. Mean age was 57±8 years (34% female; 32% black; 69% hemodialysis, 31% peritoneal dialysis).
Relative to NHANES, ESRD patients have slightly increased R (3%) and significantly lower (27%) Xc and PA values (P<0.001). ESRD patients have 11% greater extracellular (ECW) and 7% lower intracellular (ICW) water content than NHANES individuals. Results are shown below (†P<0.001):

Group	ECW-L	BCM-Kg	FFM-Kg
Black Females			
ESRD	20±3	15±2†	42±5†
NHANES	19±3	17±2	44±5
Black Males			
ESRD	21±5†	30±7†	68±11†
NHANES	17±4	32±5	65±10
White Females			
ESRD	20±3†	13±2†	41±4†
NHANES	18±3	15±2	42±5
White Males			
ESRD	20±4†	27±6†	63±10†
NHANES	18±3	32±5	65±9

These results indicate that ESRD patients are in a state of overhydration and have lower BCM and FFM that the general (NHANES) population.

OVERWEIGHT ON DIALYSIS: ENVIRONMENTAL AND GENETIC FACTORS.

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Overweight is common on general population. Desequilibrium between caloric intake (CI) and energy expenditure can lead to obesity. Recently, an uncoupling protein 2 (UCP2) polimorphism DD gene variant was associated with a raised body mass index (BMI). Our aim was analize these questions on dialysis patients. A cross sectional study was performed on 40 unselected clinical stable patients: 47.5±14.6 y, 21M, 12.5% DM2, 30 HD and 10 DPCA. Nutrient intake was recorded during a 5-day period. Fasted biochemistry (cholesterol, triglyceride, uric acid, leptin) and anthropometric indexes were evaluated: actual body weight (BW), ideal BW (by Brocca formula), body mass index (BMI) and lean body mass(LBM)=body weight-fat mass. Total Basal Energy Expenditure was calculated from the Harris-Benedict equation, corrected by activity factor (TEE) and normalized for ideal body weight (TEE id). The quotient CI/TEE =1 was considered adequate. TEE was refered to metabolic active mass (lean body mass). Length variation of the UCP2 exon 8 variant was studied by the polymerase chain reaction. Patients were classified according BMI higher or lower 25 kg/m2. Overweight appeared in 35% of patients

	BMI > 25	BMI<25	P
Age (y)	54.5±9.5	43.8±15.6	0.01
Gender (n)	5M 9F	22M 4 F	0.004
HD	9	21	NS
DCPA	5	5	NS
BMI	30.8±5.04	21.6±2.17	0.000
CI/TEE	0.69±0.1	0.58±0.20	0.03
CI/TEE id	0.73±0.15	0.58±0.18	0.01
CI/BW id	30.04±6.8	26.4±8.3	0.1
TEE/LBM	51.9±19.9	63.9±21.2	0.1
TEE ideal/LBM	49.03±17.1	64.6±22.1	0.03
%DD polymorphism	64.2	34.6	0.06
Leptin (ngr/ml)	77.5±76.6	6.6±12.1	0.02
Cholesterol(mg/dl)	218.6±31.5	193±36.9	0.03
Trigliceride(mg/dl)	241.5±115.2	175.7±83.2	0.04
Uric(mg/dl)	6.4±1.4	5.6±1.4	0.1

DD patients present BMI 27.4±6.6 vs 22.8±3.5 no DD; 50% of DD patiens present overweight. Patients with BMI> 25 have a pathologic lipid profile, less TEE for lean body mass and more CI normalized for ideal body weight and activity factor than normal subjects. Conclusions: 1. In spite of a suboptim caloric intake, overweight is an important nutritional abnormality in dialysis patients and predominates in elderly and femenine sex. 2. UCP2 polimorphism is associated with overweight in dialysis population. 3. Overweigt is associated with hyperleptinaemia, dyslipemia and a low TEE for lean body mass. 4. Overweight is conditionated by demographics, hormonals, ambiental and genetic factors.

HOMOCYSTEINE (Hcy) PLASMA LEVELS AND NUTRITIONAL STATUS IN PATIENTS TREATED BY CHRONIC HEMODIALYSIS (HD)

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Both: hyperHcy and malnutrition are strongly associated with the development of atherosclerosis in patients treated by HD. The purpose of this study was to evaluate the relationship between plasma Hcy level and nutritional status in HD patients.
In 54 HD patients (25 women and 29 men), aged 23-78 years (mean 52.1±10.4 years) plasma Hcy and folate levels were measured and several biochemical parameters and indices of nutritional status were evaluated.
Plasma Hcy levels correlated positively with plasma creatinine concentrations (r=0.4, p<0.01), lean body mass (LBM) (r=0.33, p<0.02) and negatively with plasma folate level (r=-0.42, p<0.001). The results of Hcy were divided into 4 groups and presented in the table (mean ± SD):

Hcy [mg/l]	Number of patients	Plasma folate [mmol/l]	Plasma urea [mmol/l]	Body height [cm]	MAMC [cm]
<15	4	9.5±4.6	17.5±1.3	161.5±3.0	3.3±3.2
15-30	29	21.1±19.7	23.3±6.4	167.6±8.9	10.8±8.0
31-100	17	9.6±3.8	23.7±7.5	171.0±7.9	13.8±8.4
>100	3	7.2±1.1	20.6±1.1	175.7±2.4	9.9±6.3

MAMC - middle arm max. circumference

Anova analysis revealed significant differences between groups in: plasma folate (p<0.005), plasma urea (p<0.05), body height (p<0.05). Normal Hcy levels were found in 4 patients, exclusively women with LBM 39.9±12.4 kg and plasma albumin 33±4 g/l. In opposite highest Hcy levels were found in 3 male patients with the lowest mean plasma folate.
Our study confirm, that there is high prevalence of hyperHcy in HD patients; only female patients with poor nutritional status had normal Hcy levels accompanied by average folate concentrations.

IMPAIRED TASTE ACUITY IN PATIENTS WITH END STAGE RENAL DISEASE

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Patients with end stage renal disease (ESRD) often suffer from malnutrition.
This may be due to metabolic disturbances, hormonal derangements and anorexia. Taste abnormalities is considered to be one of the cause of anorexia. We examined taste acuity in patients with ESRD and effects of hemodialysis. Ten ESRD patients (age 60+/-7.9 years: 4 male, 6 female: 8 CGN, 1 DM, 1 PCKD) were questionaired about subjective taste abnormalities and tested four primary taste acuity (sweet, salt, sour, bitter) by using taste disc (TM of Sanwa Kagaku, Nagoya, Japan). Filter paper discs (5 mm in diameter) were soaked in four primary taste solution in five different concentration, and then placed on the surface of tongue. Patients who had decreased taste acuity were tested again after start of hemodialysis.
Two patients had complaints of taste abnormalities. They could not tell which primary taste were the most disorderd. The other patients were detected taste abnormalities by taste test for the first time. Sweet and sour taste abnormalities were common in patients with ESRD. When they tested about sweet taste, sour taste and salt taste, they recognized them as bitter taste. After start of dialysis, taste acuity were improved in all patients and they got better appetite. Taste test is considered to be one of the index of adequate hemodialysis.
In conclusion, many patients with ESRD have taste abnormalities and hemodialysis can improve their abnormalities.

EFFECT OF ORAL PROTEIN SUPPLEMENTATION IN HEMODIALYSIS PATIENTS.

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Protein energy malnutrition remains a major concern in hemodialysis (HD) patients and is associated with an increased morbimortaility. Daily energy and protein intake necessary for maintening a stable and appropriate nutritionnal status are 35kcal/kg/d and 1,2g/kg/d respectively. Clinical studies showed that approximatively half of HD patients ingests less than these quantities. The aim of this study was to evaluate the nutritionnal consequences of giving oral energy-protein supplements during HD session in stable HD patients. The duration of this study was 9 months. Inclusion criteria were: HD treatment fore more than 6 months and nPCR<1.2 during the last 6 months. Exclusion criteria were: acute illness and C reactiv protein (CRP)>10mg/l as well as patient noncompliance. Eighty two patients were on maintenance HD in our department but only 23 patients were enrolled into the study. Seven HD patients were excluded during the study for differents reasons (renal transplantation, acute illness, noncompliance, death). The remaining 16 patients (9 females, 7 males; mean age 65±11 years) received at each HD session, over a 9 months period, oral protein-energy supplements containing 26g protein and 350kcal. Clinical parameters evaluated at the beginning and at the end of the study were body weight and body mass index (BMI). Biological measurements (assessed every 3 months) included nPCr, KT/Vurea, phosphate, predialysis urea concentration, serum bicarbonate, albumin, prealbumin, cholesterol, CRP. Dialysis adequacy was stable during the study (KT/Vurea 1.49±0.21 to 1.45±0.18). The dry body weight (61±9 kg to 59±8 kg) and the BMI (22±3 to 21±2) remained unchanged during the study. nPCR and predialysis blood urea concentration increased respectively from 0.8±0.1 to 1±0.1 (p=0.002) and from 1.03±0.2 to 1.24±0.2g/l (p=0.0009). Predialysis serum phosphate (47±14 to 51±11mg/l) and serum prealbumin (0.31±0.09 to 0.33±0.11) non significantly increased during the study. Serum albumin concentrations were unchanged at the end of the study (36.7±5.8 to 36.8±5.5g/l).The failure to markedly improve nutritionnal status might be related to the short study period, insufficient nutritionnal support, as well as the small number of patients. However, increase of nPCR and predialysis blood urea suggest that energy-protein supplements giving during HD sessions, could contribute to balance the nutritionnal intake in stable HD patients with low habits.

ESTIMATING EQUILIBRATED PROTEIN CATABOLIC RATE (ePCRn) FOR DAILY DIALYSIS (DD).

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Short (2-hour) Daily Dialysis (DD) is associated with a high post-dialysis rebound, and an equilibrated BUN (Ceq) should be used for computing both Kt/V (eKt/V) and PCRn (ePCRn). To avoid measuring Ceq, one could first estimate single pool (sp) Kt/V from Daugirdas equation (Deq) and then eKt/V from Daugirdas-Schneditz formula (DSeq). Equations exist that compute ePCRn from spKt/V, but only for thrice- or twice-weekly schedules. We devised an algorithm that could be particularly useful for DD: it combines Deq with DSeq and allows to estimate Ceq, as follows: 1) it estimates spKt/V from Deq; 2) it estimates eKt/V from DSeq; 3) by iteration technique it finds a new value for the postdialysis BUN (Ct) that yields eKtV= Deq. (i.e, it replaces Ct with Ceq in Deq). From an antropometric volume (V) and next pre-dialysis BUN it will be possible to compute ePCRn, with the standard formula of UKM. We tested the above algorithm by comparing the estimated Ceq with BUN measured 30 min after dialysis (C30) from 14 patients on DD (2h x 6), as well as the corresponding PCRn values (respectively, ePCRn (Ceq) and ePCRn (C30)). Since blood samples for Ct were obtained 2 min after the end of the session, the appropriate DSeq for "ven-eKt/V " was used. The more relevant results were (M±sd): Ceq= 32.7±11.9; C30= 33.3 ±12.7; difference= -0.6±3 mg/dl (P=NS); ePCRn (Ceq)=1.2±0.41, ePCRn (C30)=1,17±0.4 difference=-0.03±0.12 g/Kg/day (P=NS). Other important results were: Rebound value ((C30-Ct)/Ct *100): 15.7 ± 10.8 (%); spKtV: 0.81±0.2; eKt/V(Ceq): 0.60±0.14; eKt/V(C30): 0.66±0.19; spPCRn: 1.36±0.44 g/Kg/day. In conclusion, the suggested algorithm is based on the well known formulae for spKt/V and eKt/V; it is quite simple (the iteration can be easily performed with Excel) and provides ePCRn values sufficiently accurate, at least for clinical uses.

ASSESSMENT OF ASCORBIC ACID (AA) INTAKE AND SERUM LEVEL IN DIALYSIS PATIENTS.

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Ascorbic acid deficiency may occur in dialysis patients. It may be more pronounced in hemodialysis (HD) patients as opposed to patients on peritoneal dialysis (PD). We assessed the AA intake and determined its serum level in HD, PD patients and healthy controls. Diet history was taken from 31 PD patients (16M/15F, age 52.5+/-14.6), 28 HD patients (15M/13F, age 48.3+/-11.2) and 37 controls (14M/23F, age 33.8+/-12.2). Serum AA level (recommended value: 2.1-13.7 mg/l) was determined by colorimetric method with ascorbate oxidase in 47 PD patients (26M/21 F, age 53.2+/-15.2), 44 HD patients (25M/19F, age 51.6+/-14.1) and 37 controls (14M/23F, age 33.8+/-12.2).Patients on HD and PD were supplemented routinely with vitamin C: 100 mg daily for PD patients and 200 mg once a week for HD patients. Results: Daily diet AA intake (mean+/-SD): PD 73.9+/-51.7 mg, HD 53.5+/-36.8 mg, controls 82.1+/-50.8.AA serum level (mean+/-SD): PD 2.2+/-2.5 mg/l, HD 2.1+/-3.5 mg/l, controls 3.7+/-2.6.There was a low intake of vitamin C in the diet in all three groups. Serum level of AA were low in dialysis patients and controls and did not differ significantly between the groups. The low serum level of AA in patients may indicate either inadequate dosage or incompliance in taking vitamin C. In addition, it appears that Polish healthy population is AA deficient.

DAILY PERITONEAL LOSS OF HDL CHOLESTEROL, APOLIPOPROTEIN AND PROTEINS IN PATIENTS ON CAPD

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We studied 20 patients treated with continuous ambulatory peritoneal dialysis CAPD) aged 8-20.7 (mean 14.2 ± 4.3) years: 9 girls and 11 boys. Daily excretion in dialysate (DEx), normalized clearance (nCr, ml/day/1.73m²) and fractionated excretion (FEx) of total cholesterol (TC), HDL cholesterol (HDL-C), apolipoprotein (apoA), total protein (TP), albumin (A) and globulin (α 1, α 2, β, γ) were calculated in all patients based on measurements in serum and condensed dialysate sample from daily dialysate collection. Dialysate was condensed 70-230 times by ultracentrifugation with Vivacell 70 filter.
DEx values are shown in the table as mean values ± SD:

TC	HDL-C	ApoA	TP	A	α 1	α 2	β	γ
mg/d	mg/d	mg/d	g/d	g/d	g/d	g/d	g/d	g/d
33.48	15.39	58.4	3.8	2.44	0.26	0.3	0.37	0.42
±21	±9.1	±28.2	±1.98	±1.31	±0.16	±0.15	±0.2	±0.28

A significant positive correlation was found between peritoneal excretion of HDL-C and apoA and the excretion of TP (r=0.51 and r=0.86 respectively; p<0.05), A (r=0.56 and 0.70, p<0.05), α 1 (r=0.5, and 0.81, p<0.05), α 2 (r=0.66 and 0.97, p<0.05), β (r=0.6 and 0.85, p<0.05) and γ globulin (r=0.51 and 0.61, p<0.05). In addition, a significant positive correlation was found between daily loss of HDL-C and apoA in dialysate and nCr and FEx for TP, A, α 1, α 2, β and ã globulin. Serum HDL-C and TP were inversely correlated (r= - 0.46, p<0.05)
Conclusion: Daily peritoneal loss of HDL-C and apoA is increased in patients with higher peritoneal protein loss.

BENEFITS OF HELICOBACTER PYLORI ERADICATION IN HEMODIALYSIS(HD) PATIENTS

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In recent studies it was shown that HP infection may be responsible for the increase in acute phase response and alterations in lipid and hemostasis patterns. We aimed to see the effect of helicobacter pylori eradication on lipid profile and acute phase response of HD patients in our center. In our study, we included 88 HD patients (50 male, 38 female; mean age 38.92±10.94 years; renal failure duration 67.32±65.06 months; HD duration 53.38±65.65 months) who were diagnosed as helicobacter pylori gastritis with clo test and/or biopsy. They were chlamydia pneumonia negative and nonsmokers. Most common renal failure etiology was glomerulonephritis. All the patients were evaluated before and after helicobacter pylori eradication treatment with amoxicillin, clarithromycin and omeprazole for 2 months. Alterations in CRP, sedimentation rate, ferritin, fibrinogen, total protein, albumin, total cholesterol, triglyceride, LDL, HDL, VLDL were evaluated. After eradication of helicobacter pylori infection, there was statistically significant decrease in CRP (15.73±24.26 to 10.85±16.27 mg/L, p<0.03), sedimentation rate (42.92±27.33 to 31.70±19.87 mm/hr, p<0.005), fibrinogen (341.26±116.43 to 329.73±202.14 mg/dl, p<0.03). Meanwhile HDL (38.68±9.33 to 45.76±10.38 mg/dl, p<0.001), total protein (6.82±0.59 to 7.14±0.56 g/dl, p<0.001) and albumin (3.74±0.39 to 3.96±0.40 g/dl, p<0.001) levels were significantly increased. There was no significant change in ferritin, total cholesterol, LDL, VLDL and triglyceride levels (p>0.05). As a result our findings support the hypothesis that chronic infections may change lipid profile and acute phase response in a way that could increase the risk of cardiovascular disease due to atherosclerosis so we advise to screen and treat hemodialysis patients for helicobacter pylori infection because of its probable beneficial effects.

DAILY HEMODIALYSIS (DD) CAN IMPROVE NUTRITIONAL STATUS.

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Introduction: Caloric proteic malnutrition (CPM) is the main factors of morbidity and mortality in dialysis patients. Many efforts were made to improve nutritional status, including oral and parenteral supplements of nutrients.
Aim of the work is to evaluate if a change of dialysis schedule, namely DD, is able to modify nutritional status of dialysis patients.
Material and Methods: We studied prospectively 13 patients before and after 6 months of DD (two hours for session, 6 days a week).
We evaluated nutritional status by biochemical indices (Total protein TP, Albumin Alb; Cholesterol Cho, White blood cells WBC, Hemoglobin Hb,); and Bioimpedance (Body Cell Mass BCM, Total water TW, Extra Cellular water ECW, Phase Angle PA). Dialysis efficiency was evaluated by dpEKRc and the Proteic intake by PCR. Both formulas were specially designed for the purpose (Abst XXXVIII congress EDTA: Estimating equilibrated PCR for Daily Dialysis)

	Standard	HD	Daily Dialysis
AF	3,806	4,344	P<0.05
ALB	4,008	4,183	n.s.
BCM%	29,116	31,049	P<0.05
ECW%	59,394	49,125	P<0.01
BCM Kg	15,628	16,395	P<0.05
PT	6,975	7,108	n.s
TW%	58,346	54,705	P<0.01
PCR	1,115	1,453	P<0.05
dpEKRc	13,406	15,494	P<0.01

Results:Our data show a significantly increase of BCM, PA and, decrease of ECW. Total protein and albumin raised but not significantly KT/V and PCR improved significantly in the period of study:
Conclusions:
1) DD is able to increase nutritional status
2) Bioimpedance is able to detect early changes of nutritional status and body composition.
3) To obtain valuable date for DD it is necessary to assess PCR and KT/V with specially designed formulas
3) Anthropometry and biochemical parameters are not early markers of nutritional status change

ANTHROPOMETRIC AND BIOELECTRICAL IMPEDANCE MEASURE-MENTS: TWO SENSITIVE METHODS FOR ESTIMATING THE EVOLUTION OF THE MALNUTRITION STATUS IN HEMODIALYSIS PATIENTS

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Protein-energy malnutrition, which has been estimated to range from 10 to 70% in hemodialysis patients (HDpts), is frequently associated with increased mortality. Thus, the monitoring of the undernutrition status can be usefull in order to predict a risk of death. In 7 of 53 HDpts (2M and 5F, age: 60±21 yrs, length of time on dialysis: 74±46 months) with a body mass index <19 we studied the malnutrition course every three months, for a period of 18 months, using not only the common biochemical parameters such as serum albumin (A), transferrin (T), cholesterol (C) and total lymphocyte count (TLC) but also anthropometric indexes: triceps skinfold (TSF, mm), mid-arm circumference (MAC, cm), mid-arm muscle circumference (MAMC, cm), arm muscle area (AMA, cm^2) and other indexes derived from the bioimpedance analysis: phase angle (PA, degrees), reactance (Xc, ohms) and the so-called distance (D) calculated by the formula: [(PA x10)+Xc] / square root of 2. The biochemical data revealed during the study a reduction in serum A and C only at 18^{th} month: p=0.03 (A) and p=0.04 (C), but not in serum T and in TLC. On the contrary, all the anthropometric and bioimpedance analysis data progressively reduced from the start to the end of the study with a significant difference already to 9^{th} month (TSF : 6.9 ± 1.8 vs 7.8 ± 2.2, p=0.0009; MAC : 18.8 ± 4.5 vs 20.1 ± 4.4, p=0.006; MAMC : 17.3 ± 3.6 vs 18.0 ± 4.2, p=0.004; AMA : 24 ± 11 vs 27 ± 13, p=0.0001; Xc : 44 ± 16 vs 51 ± 16, p=0.002; PA : 4.1 ± 0.9 vs 4.6 ± 0.7, p=0.0008; D : 86 ± 22 vs 97 ± 21, p=0.001).
In conclusion the study suggests that the anthropometric and bioimpedance analysis investigation may be more usefull than biochemical examination for monitoring the malnutritional status in HDpts.

A COMPARISON OF LEPTIN LEVELS, ANTHROPOMETRY AND NUTRITIONAL STATUS IN HEMODIALYSIS AND CAPD PATIENTS

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The assosiation between plasma leptin levels and malnutrition has recently been suggested in renal failure. We performed this study in a sample of patients with chronic renal failure (CRF) undergoing peritoneal dialysis (PD) (n=26) and hemodialysis (HD) (n=27) with the aim of analysing the impact of the different modes of therapy on serum leptin levels and correlations between leptin levels and anthropometric measurements, nutritional and biochemical parameters. Plasma leptin levels were higher in patients treated CAPD (median 17,28ng/ml) than in those HD (7,0ng/ml) (p<0,001). There was no significant difference bodymass index (BMI), multiple skinfold thicknes measurements, fatty percentage of body weight and fat mass accounts between two groups. But there was significant correlation between all of these anthropometric measurements and leptin levels (p=0,0001). And also energy, protein and fat intake, serum albumin, prealbumin, total cholesterol, HDL, LDL levels didn't correlate with serum leptin levels. But between VLDL and triglyseride and leptin levels there was significant correlation.
As conclusion the differnce of leptin levels between PD and HD should be explained out of the nutritional factors. And leptin levels. may be used as a good indicator as well as anthropometric measurements, serum albumin and prealbumin levels for nutritional status and appetite