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CLINICAL FACTORS ASSOCIATED WITH SERUM COPPER CONCENTRATION IN PATIENTS ON HEMODIALYSIS

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It is well known that renal insufficiency influences trace element metabolism. In particular, patients treated with hemodialysis (HD) are at higher risk for both deficiency and excess of trace elements. However, derangements of serum trace element levels reported by previous studies were sometimes inconsistent. In addition, harmful effects by trace element derangements seem quite unclear.

In this cross-sectional study, we examined clinical factors associated with serum copper levels in patients treated with HD for more than or equal to 6 months.

In 49 patients (male : female =29 : 20, age 71 ± 10 years, HD duration 84 ± 71 months), the mean value of serum copper was 93.8 ± 16.2 μg/dL. In univariate analysis, there were no significant correlation between serum copper levels and patient's age, sex, HD duration, the presence of diabetes mellitus, serum albumin levels, and body mass index. Serum copper levels significantly correlated with serum levels of high-sensitivity C-reactive protein (hs-CRP; $r=0.474$, $P=0.001$) and malondialdehyde-low-density lipoprotein ($r=0.371$, $P=0.009$). It was notable that serum copper levels tended to be lower in those treated with higher dose of sevelamer hydrochloride ($r=-0.255$, $P=0.07$). In multivariate analysis, hs-CRP remained to be an independent determinant of serum copper levels.

We showed significant association of serum copper levels with inflammation and oxidative stress in HD patients. Further studies are required to investigate whether sevelamer may improve serum copper levels, inflammation, and oxidative stress.

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MODIFIED MIS SHEET IS DESIRABLE FOR THE NST ACTIVITY ON CHRONIC DIALYSIS PATIENTS

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Nutritional status is the most important factor which guarantees long survival with higher quality of life on chronic dialysis patients. Various procedures for evaluating nutritional status have been proposed but the standard of them has not been established. We modified the MIS sheet, which was originally established by Kalantar-Zadeh, by adding some parameters as CRP, nPCR and the dialysis prescription on the same sheet.

We have performed NST activity using the modified MIS sheet twice a year for recent 6 years. We categorize the patients into the next three groups based on total point of MIS; Normal, Mild malnourished and moderately/severely malnourished. The patient survival in each group could be clearly identified from each other. The causes of malnutrition were categorized as inflammatory type, mal-dietary type and mixed type. Therapeutic interventions were inducted for each type; those were a treatment for pyorrhea, foot care and a dialysis prescription change. Dietitians interviewed the patients with mal-dietary type malnutrition and their families. Every six months, we repeatedly evaluated the nutritional status of the patients and determined whether our interventions had succeeded.

Our modified MIS sheet is not only a screening tool but a practical tool by which we can make a therapeutic plan for various types of malnutrition.

Our preliminary results clarified that the interventions derived from the MIS system could significantly improve the total score of MIS. In conclusion the modified MIS sheet is desirable for a daily NST activity on chronic dialysis patients.

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PROTEIN CATABOLIC RATE SHOULD BE NORMALIZED BY IDEAL BODY WEIGHT NOT BY POST-DIALYSIS BODY WEIGHT.

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Protein catabolic rate (PCR) is calculated by urea kinetic model thorough the dialysis session and it is recognized as expressing the protein intake in the steady state of dialysis patients. PCR is generally normalized by post-dialysis body weight (BW), expressed as nPCR, however, most dietary guidelines for protein intake are documented as PCR normalized by ideal BW (iPCR). We evaluated which is better nPCR or iPCR to estimate the impact on the patient survival and to use it for dietary education for dialysis patients.

119 chronic dialysis patients whose dialysis vintages were longer than 3 years were selected into this study. The mean age of them was 62.4years old and the mean dialysis vintage was 115.4 months. The patients were divided into 4 groups by each PCR value as less than 0.7, 0.7– 0.9, 0.9–1.1, greater than 1.1 g/Kg/day. Kaplan-Meier analysis was conducted to evaluate the 5–year patient survival in each PCR method. The difference in the patient survival between 4 groups in each PCR method was evaluated by Log-rank test.

Among 119 patients 30 patients died and 9 patients were censored out, and the overall 5-year survival rate was 74.4%. There were no significant differences between 4 groups in nPCR. However, a significant risk in the group less than 0.7 g/Kg/day and a significant benefit in the group greater than 1.1 g/Kg/day were observed in iPCR. Both nPCR and iPCR were not independent significant risk factor on the patient survival. Only age and the serum level of CRP were significant risk factor. We concluded the PCR should be normalized by ideal BW not by post-dialysis BW.

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EFFECTS OF SOY CONSUMPTION ON SERUM LIPIDS AND APOPROTEINS IN PERITONEAL DIALYSIS PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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Lipid abnormalities, particularly high serum concentration of lipoprotein(a) [Lp(a)], are one of the major risk factors for cardiovascular disease (CVD) in peritoneal dialysis (PD) patients. The present study was designed to investigate the effects of soy consumption on serum lipids and apoproteins, especially Lp(a), in PD patients .This study was a randomized clinical trial in which 40 PD patients (20 males, 20 females) were randomly assigned to either the soy or the control group. Patients in the soy group received 28 g/day textured soy flour (containing 14 g of soy protein) for 8 weeks, whereas patients in the control group received their usual diet, without any soy. At baseline and the end of week 8 of the study, 5 mL of blood was collected from each patient after a 12- to 14-hour fast and serum triglyceride, total cholesterol, low density lipoprotein-cholesterol (LDL-C), high density lipoprotein-cholesterol (HDL-C), apoprotein B100 (apo B100) apoprotein A (apo AI), and Lp(a) were measured.

In the present study, serum Lp(a) concentrations were above the normal range in 86% of the PD patients. Mean serum Lp(a) concentration was reduced significantly, by 41%, in the soy group at the end of week 8 compared to baseline ($p < 0.01$); the reduction was also significant compared to the control group ($p < 0.05$). During the study, mean serum Lp(a) concentration did not change significantly in the control group. There were no significant differences between the two groups in mean changes in serum triglyceride, total cholesterol, HDL-C, LDL-C, apoB100, or apoAI.

The results of our study indicate that soy consumption reduces serum Lp(a) concentration, which is a risk factor for cardiovascular disease in peritoneal dialysis patients.

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FERRIC CITRATE: AN IRON-BASED ORAL PHOSPHATE BINDER

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Patients with end-stage renal disease (ESRD) often experience secondary bone and mineral disorder requiring treatment with phosphate-binder (PB) medications, vitamin D sterols, and calcimimetics. Ferric citrate is an oral, iron-based PB in clinical development that has been shown to reduce serum phosphorus while increasing serum ferritin and transferrin saturation (TSAT) in ESRD patients. In a Phase 2 study, patients receiving