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ASSOCIATION OF MALNUTRITION-INFLAMMATION COMPLEX AND RESPONSIVENESS TO ERYTHROPOIESIS STIMULATING AGENTS IN HEMODIALYSIS PATIENTS

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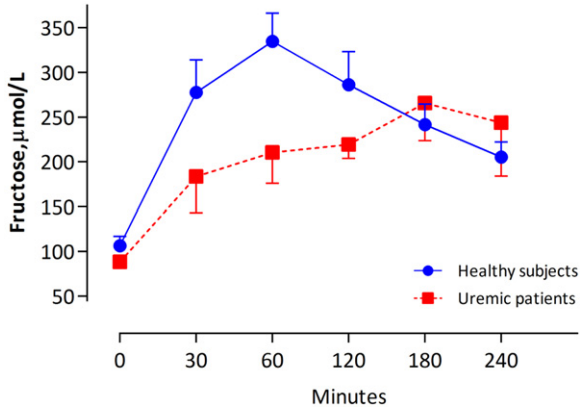
Protein-energy wasting, inflammation and refractory anemia are common in long-term hemodialysis patients. A decreased responsiveness to erythropoiesis stimulating agents (ESA) is often the cause of the refractory anemia. A 6-year prospective cohort study of 754 hemodialysis patients, we hypothesized that malnutrition-inflammation score (MIS) is an independent predictor of decreased responsiveness to ESAs (ERI) in hemodialysis patients. Mean age of patients was 54 ± 15 years, 53% were diabetic and 49% Hispanic. A positive correlation was found between ERI and inflammatory markers including C-reactive protein (CRP) (r=0.16) and interleukin-6 (IL-6) (r=0.16). We also found negative correlations between ERI and serum albumin (r= −0.22). Each 5 unit higher MIS, 1 mg/L higher CRP and 0.5 g/dl lower albumin were associated with 46%, 45% and 140% higher likelihood of highest vs. lowest ERI in fully adjusted logistic regression models (odds ratio [and 95% CI] of 1.46 [1.05-2.05], 1.45 [1.06-1.98], and 2.40 [1.54-3.74]) respectively. Cubic splines illustrated continuous and incremental nature of MIS and ERI associations (Figure). Malnutrition-inflammation complex is a significant and independent predictor of decreased responsiveness to ESAs in hemodialysis patients.



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PRACTICE PATTERNS OF CLINICIANS: ASSESSMENT OF MALNUTRITION IN CKD DIALYSIS AND INTERVENTIONS

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With limited information on the practice patterns regarding clinician identification of malnutrition and the use of nutritional interventions in malnourished CKD-5 dialysis patients, a market research survey was conducted by NKF sponsored by Pentec Health to evaluate this amongst renal clinicians. For dialysis patients, results for the top four assessment markers were: decreased appetite; albumin level; decrease in dry weight, quality of life. Most commonly recommended oral supplements (OS) were nutritionally complete renal, diabetic and standard products with most common barriers: out of pocket cost; patient resistance; and reimbursement issues. Nutrition support and food during dialysis responses for outpatients in table below:

	Barriers to Use (Top 3)	
Nutrition Intervention	% of clinicians who would recommend	
Tube Feeding	28.0 %	Not available at unit; patient resistance; family resistance
Intradialytic Parenteral Nutrition (IDPN)	48.7 %	Reimbursement ; not available at unit; MD resistance
Intraperitoneal Nutrition (IPN)	22.0 %	Not available at unit; reimbursement; MD resistance
Total Parenteral Nutrition (TPN)	16.9 %	Not available at unit; reimbursement, MD resistance
Food During Hemodialysis	83.3 % OS 63.3% Food	Drop in blood pressure, risk of aspiration; hygiene

Findings: A clinician gap seems to exist around nutrition support interventions in CKD-5 dialysis patients. Meal provision during dialysis could be expanded. These interventions may improve the nutritional status of dialysis patients.

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RESISTANCE EXERCISE PROGRAM: INTERVENTION TO REDUCE INFLAMMATION AND IMPROVE NUTRITIONAL STATUS IN HEMODIALYSIS PATIENTS

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Exercise programs have been recommended as nutritional interventions in hemodialysis (HD) patients to minimize loss of muscle mass, improve physical and functional capacity, inflammation thus controlling or preventing cardiovascular diseases (CVD), which accounts for 50% of mortality in dialysis patients. Therefore the purpose of this study was to analyze the effects of a resistance exercise (RE) program on biochemical parameters, inflammation markers, and body composition in HD patients. Thirty- six HD patients (61.1% men, mean age 46.7 ± 2.5yrs) were studied. The anthropometric and biochemical parameters are presented in Table. There were significant differences after 6 months of RE in albumin and CRP plasma levels and body composition parameters. The HD patients gained nearly 3kg of lean mass and lost about 3% of body fat.

Parameters	Before(n=30)	After(n=30)
BMI (kg/m^2)	22.8 ± 4.0	23.3 ± 4.3
Arm muscular area (cm)	30.3 ± 13.7	35.4 ± 13.8*
Body Fat (%)	31.5 ± 5.6	28.4 ± 5.9*
Lean mass (kg)	42.4 ± 10.0	45.5 ± 11.0*
Albumin (g/dL)	3.6 ± 0.3	3.8 ± 0.2*
Globulin (g/dL)	3.2 ± 0.3	2.8 ± 0.5**
Interleukin-6 (pg/mL)	81.3 ± 9.4	78.7 ± 10.4
TNF-α (pg/mL)	25.7 ± 6.5	24.3 ± 8.7
Creatinine (mg/dL)	12.5 ± 3.6	12.2 ± 3.7
CRP (pg/mL)	2.9 ± 0.4	2.0 ± 0.1*

*p < 001.

**p < 05.

In conclusion, statistically significant improvements were observed in body composition, albumin and CRP levels after 6 months of resistance exercises.