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Bioelectrical Impedance Analysis to Predict Outcomes in Hemodialysis Patients

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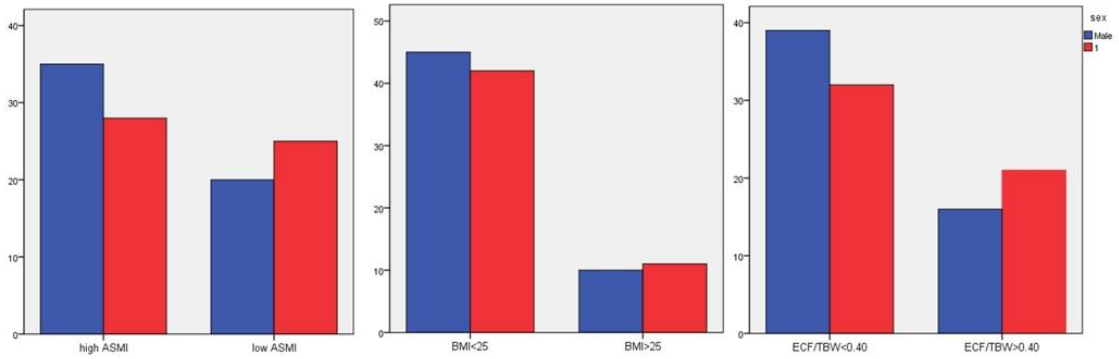
Objectives: Overhydration and sarcopenia in patients with end stage renal disease (ESRD) are associated with all-cause mortality and cardiovascular events, while obesity is associated with better survival. Although ESRD patients on hemodialysis check body weight every session, it is not easy to check the change of body composition. The aim was to evaluate the effect of body composition (fat, water, and muscle) on survival and hospitalization in maintained HD patients.

Methods: Single center retrospective observational study was designed. End stage renal disease patients who were on thrice weekly hemodialysis were enrolled. They were assigned to body composition test using bio-impedance analysis method. Their outcomes (death and hospitalization) were followed up for 2 years.

Results: Total 114 HD patients (56.2±13.3 years old, 58 males) were enrolled. Forty eight (42%). Patients were diabetic. At baseline, BMI and appendicular skeletal muscle index (ASMI) was 22.2 (15.5-34.1) and 8.5kg/m² (4.1-13.7), respectively. So obesity (>25 kg/m²) and sarcopenia (ASMI <7.0 kg/m²; male or <5.7 kg/m²; female) was 19.4% and 41.6%, respectively. Thirty two patients had overhydration (the ratio of extracellular water to total body water >0.40). During 23.5 (0-27) months, 12 and 2 patients died. Total 37 patients (34.3%) admitted 2.5 (1-15) times and 23 (1-209) days, respectively. Sarcopenia had no difference of survival and hospitalization. Obesity was not associated with survival, but with hospitalization. Overhydation was associated with survival (hazard ratio [HR] 5.8; 95% confidence interval [CI], 1.54-21.9, p<0.01) and hospitalization (HR 1.69; 95% CI, 1.08-2.66, p=0.022), respectively. However, this difference disappeared after adjusting age, sex, diabetes, weight and albumin.

Conclusions: Hydration status predicts survival and outcomes of HD patients rather than fat or muscle mass. Further controlled studies are need to confirm the effect of body composition in HD patients.

Figure 1. Frequency of low muscle mass, obesity and over-hydration according to sex



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