KSN 2020
FULLY VIRTUAL MEETING

Abstract Type : Poster
Abstract Submission No. : PO-1321

Bioelectrical impedance analysis-derived phase angle as a marker of nutritional status in hemodialysis patients

In Hee Lee, Chang Woo Hong, Woo Hyun Lee, Seong Gyu Kim, Gun Woo Kang, Ki Sung Ahn
Department of Internal Medicine-Nephrology, Daegu Catholic University School of Medicine, Korea, Republic of

Objectives: The aim of this study was to assess the association between different nutritional markers and bioelectrical impedance analysis (BIA)-derived phase angle (PhA) in patients with end-stage renal disease (ESRD) and to evaluate the predictive value of the PhA for malnutrition risk in these patients.

Methods: We performed a cross-sectional study with 126 adult ESRD patients undergoing hemodialysis (HD) for ≥6 months, 44% females, 56% diabetics, with mean age of 62.02±13.1 years and the mean HD duration of 45.6±36.2 months. Based on the geriatric nutritional risk index (GNRI), the patients were categorized into either malnourished (GNRI ≤98) (Group 1, n=54) or normal groups (GNRI >98) (Group 2, n=72). We measured complete blood count, biochemical parameters, dialysis adequacy, BIA, and relative hand grip strength (HGS) in both groups.

Results: Group 1 exhibited significantly higher average age ($p<0.001$) and lower PhA ($p<0.001$). All of the following parameters were lower in Group 1: serum creatinine ($p<0.001$), cholesterol ($p=0.005$), total lymphocyte count (TLC) ($p=0.007$), albumin ($p<0.001$), prealbumin ($p<0.001$), transferrin ($p<0.001$), and insulin-like growth factor-1 (IGF-1) ($p=0.001$). Although extracellular water/total body water (ECW/TBW) ratio ($p<0.001$) was higher in Group 1, body fat mass ($p<0.001$), body mass index ($p<0.001$), normalized protein nitrogen appearance (nPNA) ($p=0.041$), and relative HGS ($p=0.044$) were higher in Group 2. The PhA was positively correlated with TLC ($r=0.381$, $p<0.001$), creatinine ($r=0.626$, $p<0.001$), albumin ($r=0.459$, $p<0.001$), prealbimin ($r=0.714$, $p<0.001$), transferrin ($r=0.413$, $p<0.001$), IGF-1 ($r=0.542$, $p<0.001$), nPNA ($r=0.356$, $p<0.001$), and GNRI ($r=0.550$, $p<0.001$). On multiple regression analysis, prealbumin ($p=0.003$) and ECW/TBW ratio ($p<0.001$) were significant independent factors associated with PhA. Receiver operator characteristics (ROC) curve analysis suggested that proper PhA cut-off point for malnutrition risk was 4.2° with 71.8% sensitivity, 63.6% specificity.

Conclusions: The results of this study suggest that BIA-derived PhA can be considered as a useful marker of nutritional status in maintenance hemodialysis patients.