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The relationship between serum leptin and nutritional status in end stage renal disease without dialysis

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Objectives : The patients with end stage renal disease (ESRD) are commonly accompanied by malnutrition because uremia usually causes nausea and loss of appetite. Bioimpedance spectroscopy (BIS) is a useful method to estimate body fluid status, and could also evaluate nutritional status by the value of phase angle. Leptin is an adipokine to inhibit hunger and appetite. In the study, we aim to investigate the relationship between biochemical nutritional markers including leptin and phase angle representing nutritional status in ESRD patients.

Methods : We enrolled ninety-one patients with ESRD who were planned to get dialysis therapy. We collected the biochemical serum markers, such as albumin, total cholesterol, triglyceride, high-density lipoprotein, low-density lipoprotein, hemoglobin, basal urea nitrogen, creatinine, leptin and ghrelin. In addition, using BIS, we evaluated total body water, extracellular water, intracellular water, overhydration index, fat tissue index, lean tissue index and phase angle. We defined poor nutritional status as a phase angle <4.5°, and proper nutritional status as a phase angle >4.5°. Leptin levels were categorized into trisection to be analyzed statistically.

Results : The result showed that the patients with proper nutritional status, compared to with poor nutritional status, had significantly higher levels of albumin (3.7±0.5 vs 3.0±0.5 g/dL, p<0.001) and leptin (7.0±6.2 vs. 3.8±3.1 ng/dL, p=0.002), higher lean tissue index (15.3±2.7 kg/m2 vs. 13.1±3.5 kg/m2, p=0.001) and lower extracellular water amount (16.0±3.1 vs. 19.7±6.4 L, p<0.001). In the multivariate logistic regression analysis, high level of leptin was significantly associated with proper nutritional status (odds ratio/95% confidence interval; 28.06/1.21~653.3, p=0.003).

Conclusions : Increased leptin level is associated with proper nutritional status in ESRD patients. We believe that it may be due to a negative feedback role of leptin to diet and nutrition. Conclusively, we suggest that leptin could be used as a valuable marker to estimate the nutritional status in ESRD patients.

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