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Dialysis

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Comparisons of body composition changes between hemodialysis and peritoneal dialysis patients

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Background: Protein-energy wasting (PEW) is a state of decreased body stores of protein and energy fuels. PEW is frequently observed in the dialysis patients and various factors such as uremic toxins, insulin resistance and chronic inflammation are known to induce PEW. Dialysis itself is also known to cause PEW. However, it is not yet defined which of the dialysis modalities is more likely to induce PEW. This study aimed to test this issue.

Methods: This is a single center, retrospective cohort study that underwent hemodialysis (HD) and peritoneal dialysis (PD) at Pusan National University Hospital from January 2012 to December 2015. PEW was assessed by changes of skeletal muscle mass index (SMMI), which was measured biyearly using Inbody S20 (Biospace, Korea). The body weight (BW) and body mass index (BMI) were measured, and other body composition parameters such as fat mass index (FMI) and fat free mass index (FFMI) were also measured using the same instrument. Changing rate of body composition was calculated as followed up data minus baseline data divided by baseline data. Comparisons of the changes of each body composition parameters were made between HD and PD patients.

Results: A total of 40 HD and 47 PD patients were included in this study. The mean patient ages were 51.53±10.31 years old and 59.8% of the patients were male. The mean dialysis vintage was 1.92±2.25 years. All of these baseline characteristics were not statistically different between the two dialysis cohorts. During the median follow up periods of 3.45±1.01 years, BW (64.25±12.19 VS 61.81±11.31 kg, p<0.001), BMI (23.38±3.52 VS 22.75±3.30 kg/m^2, p<0.001) and SMMI (9.64±1.66 VS 8.91±2.41 kg/m^2, p<0.001) were significantly decreased, and these changes were also significant in the HD group: BW (64.02±13.81 VS 59.75±12.90 kg, p<0.001), BMI (23.24±3.94 VS 22.21±3.76 kg/m^2, p<0.001) and SMMI (9.29±1.92 VS 7.99±3.04 kg/m^2, p=0.001). In the PD group, BW and BMI were unchanged, however SMMI showed the decreased trend during the dialysis (9.93±1.33 VS 9.70±1.16 kg/m^2, p=0.017). When we compared the mean changing rate of each parameter according to the dialysis modality, BW and SMMI decreased faster in the HD patients: BW (-0.061±0.101 VS -0.008±0.081, p=0.008), SMMI (-0.108±0.321 VS -0.556±0.300, p=0.002). Other parameters of FMI and FFMI were unchanged during the follow up periods in both dialysis cohorts.

Conclusion: During the maintenance dialysis, BW and SMMI were gradually decreased. The changing rate of BW and SMMI were faster in the HD than the PD patients, suggesting that progression of PEW might be faster in the HD patients compared to the PD patients.

Keywords: dialysis, protein energy wasting