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Dialysis

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Left ventricular hypertrophy associated factors in hemodialysis patients

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Background: Left ventricular hypertrophy (LVH) is highly prevalent in patients with end-stage renal disease. LVH is an independent predictor of cardiovascular mortality in the patients. We investigated which elements of hemodialysis (HD) are associated with LVH.

Methods: We performed a cross-sectional study on maintenance HD patients at the dialysis unit of Konkuk University Hospital. Inclusion criteria were age >15, and maintenance HD for more than a month. Left ventricular mass index (LVMI) was measured by echocardiography. LVH was defined as LVMI >125 g/m^2 in male patients and >110 g/m^2 in female patients. Multi-frequency bioimpedance analysis was done before, hourly during HD, and after the HD session. Blood pressure (BP) was measured at the same time. Correlation analysis utilized the Spearman's Rank Correlation coefficient.

Results: The mean age of the subjects was 61.7 ± 15.9 (range, 23-87 yr). The dialysis vintage was 67.7 ± 51.5 months. Among the 47 subjects, 55.3% were female. Underlying diseases were DM (48.9%), hypertension (36.2%), chronic glomerular nephritis (10.6%) and unknown (4.3%). The median value of LVMI was 118.5 g/m^2 (range, 64-239). LVH was detected in 28 patients. The BP of 16 patients went up during HD. There were no significant differences between the patients with or without LVH for age, gender, dialysis vintage, weight, BMI, body surface area (BSA), total body water (TBW), intracellular water (ICW), extracellular water (ECW), ECW/TBW, ultrafiltration volume, and BP. However, for ECW per body weight ($ECW_{body\ weight}$, L/kg, p=0.068) and ECW per BSA (ECW_{BSA}, L/m^2, p=0.066), the differences were marginally significant. LVH was more common in patients with BP rising during HD. A positive correlation was noted between LVMI and ECW (r=0.354, p<0.05), TBW (r=0.349, p<0.05), ICW (r=0.297, p<0.05), $ECW_{body\ weight}$ (r=0.370, p<0.05) and ECW_{BSA} (r=0.485, p<0.01). By multivariate logistic regression analysis, risk factors for LVH was BP rising during HD (OR 5.9 (1.18-29.3), p<0.05, adjusted for systolic BP).

Conclusion: We found an association between LVH in HD patients and corrected ECW by BSA or body weight and BP rising during HD.

Keywords: bioimpedance, left ventricular hypertrophy