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Association of proteinuria with cardiac structure and diastolic dysfunction in incident hemodialysis patients

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Objectives : Few studies have addressed the association of proteinuria with cardiac structure and diastolic dysfunction in incident hemodialysis patients. Our study investigated quantitative proteinuria and its association with echocardiographic abnormalities in incident hemodialysis patients.
Methods : This study was a cross-sectional, retrospective cohort study. A total of 525 incident hemodialysis patients who started dialysis therapy at Kangdong Sacred Heart Hospital from 2010 to 2020 were included in this study. The quantitative proteinuria was calculated with the random urine protein to creatinine ratio. The proteinuria was categorized into 4 groups with <1.0, 1.0-3.0, 3.1-6.0, and >6.0 g/g of urine protein to creatinine ratios. The diastolic dysfunction was defined as more than 15 of the ratio of the early transmitral blood flow velocity to early diastolic velocity of the mitral annulus (E/e'), and left ventricular hypertrophy (LVH) was classified by the left ventricular mass index.
Results : Among 525 participants, the mean age was 62.2 ± 14.0 years and 61.0% were male. The highest proteinuria group (>6.0 g/g) had higher serum brain natriuretic peptide levels (1256.8 ± 1354.9 vs. 789.7 ± 1170.9 pg/mL, P=0.002) and more LVH (88.9% vs. 73.1%, P=0.004) than lowest proteinuria group (<1.0 g/g). In multivariate logistic regression models adjusted with multiple covariates, the highest (>6.0 g/g) and second highest (3.1-6.0 g/g) proteinuria groups were significantly associated with diastolic dysfunction compared to the lowest group (OR 3.82, 95% CI 1.57-9.29, P=0.003 and OR 3.64, 95% CI 1.45-9.13, P=0.006, respectively). However, ejection fraction was not different among proteinuria groups.
Conclusions : In incident hemodialysis patients, the amounts of proteinuria are associated with left ventricular structure and cardiac diastolic dysfunction. Proteinuria may be a useful marker to predict the risk of cardiac diastolic dysfunction in hemodialysis patients.