KSN 2017 Abstract

KSN-17-O042

INCREASED PLASMA NGAL LEVELS ARE INDEPENDENTLY ASSOCIATED WITH LEFT VENTRICULAR HYPERTROPHY AND DIASTOLIC DYSFUNCTION IN PATIENTS WITH CHRONIC KIDNEY DIEASE.

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Objectives : Cardiovascular disease (CVD) is the leading cause of death in patients with chronic kidney disease (CKD). Left ventricular hypertrophy (LVH) and diastolic dysfunction is known for the predictors of CVD in these patients. Neutrophil gelatinase-associated lipocalin (NGAL) is a biomarker of acute kidney injury. Recently, elevated NGAL levels have been reported in patients with CVD. This study aimed to evaluate the association between plasma NGAL levels and the cardiovascular structure/function in patients with CKD.

Methods : This study included 323 pre-dialysis CKD patients (estimated glomerular filtration rate (eGFR) < 60 ml/min/1.73m2). Two-dimensional echocardiography was performed to measure the left ventricular mass index (LVMI) and ejection fraction (LVEF). Tissue Doppler imaging was used to measure the early mitral inflow velocity (E) and the peak early mitral annular velocity (E'). Diastolic function was estimated by the E' and the ratio of E to E' (E/ E'). The associations of echocardiographic index with clinical and laboratory variables [age, sex, diabetes, hypertension, eGFR, albumin, uric acid, calcium, phosphate, total cholesterol, hemoglobin, C-reactive protein, intact parathyroid hormone, and plasma NGAL] were investigated by univariate (Pearson's correlation, r) and multivariate analysis (multiple linear regression analysis, β).

Results : In univariate analysis, the plasma NGAL levels correlated with indices of LVH and diastolic dysfunction (LVMI: r = 0.222, P < 0.001; E': r = -0.596, P < 0.001; E/ E': r = 0.424, P < 0.001). However, they did not correlated with index of systolic dysfunction (LVEF). In multivariated analysis, the plasma NGAL levels were significantly associated with LVMI (β = 0.151, P = 0.009), E' (β = -0.567, P < 0.001), and E/ E' (β = 0.396, P < 0.001) after adjustment for other confounding factors. When diastolic dysfunction was defined by E' < 8 cm/s, ROC analysis (AUC: 0.835, 95% CI: 0.792-0.879) showed the best cut-off value of plasma NGAL for identifying the diastolic dysfunction was ≥ 258 ng/ml with an associated sensitivity of

77.6% and specificity of 87.6%.

Conclusions : Increased NGAL levels were independently associated with increased LVMI, decreased E' and, increased E/E' in patients with CKD, suggesting that plasma NGAL might be a biomarker for LVH and diastolic dysfunction in them.

Keywords : Chronic kidney disease; Diastolic dysfunction; Neutrophil gelatinase-associated lipocalin (NGAL)