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The relations of abdominal aorta calcium score (AACS) to left ventricular hypertrophy (LVH) in non-dialysis chronic kidney disease (NDCKD): Results from KNOW-CKD

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Objectives: Cardiovascular diseases are major causes of mortality and morbidity in CKD. Bone mineral disorders in CKD (CKD-MBD) contribute greatly to the development of LVH which is an important predictor of cardiovascular disease. Abdominal aortic calcification is one of the manifestations of vascular calcification which is a main component of CKD-MBD. We aimed to assess the relations of AACS to LVH in NDCKD.

Methods: We cross-sectionally analyzed baseline data at enrollment to KNOW-CKD which is a prospective cohort study of NDCKD in Korea. AACS was measured in a total of 2048 patients by lumbosacral lateral radiography using method proposed by Kaupilla et al. LVH was defined as left ventricular mass index (LVMI) >115g/m^2 in men and >95g/m^2 in women.

Results: The patients were classified as having no (AACS=0, n=1334), moderate (AACS=1-3, n=439), and severe (AACS≥4, n=275) abdominal aortic calcification according to AACS. The patients with higher AACS had higher LVMI (89.6±22,9 g/m^2, 97.9±25.8 g/m^2 103.2±25.9 g/m^2 in no, moderate, and severe abdominal aortic calcification respectively). In multivariate linear regression adjusted by age, sex and all significant variables in univariate linear regression, AACS was a significant independent factor for LVMI (β=0.543, p=0.017, 95% CI of B=0.097-0.988). In multivariate logistic regression fully adjusted by age, sex and all other significant variables, AACS was continuously associated with the increased risk of LVH (HR per 1unit increase in AACS=1.062, 95% CI= 1.008-1.119 p=0.024). The patients with severe abdominal aortic calcification had a higher probability for LVH compared to patients without calcification in a fully adjusted model (HR=1.441 95% CI=1.023 to 2.028 p=0.036).

Conclusions: Abdominal aortic calcification was a significant risk factor of LVH in NDCKD. The mechanism by which abdominal aortic calcification contributes to LVH in NDCKD remains to be determined through further studies.