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Left ventricular diastolic dysfunction in Pediatric Chronic kidney disease patients: Data from KNOW-Ped CKD study

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Objectives: Cardiovascular disease (CVD) is most common cause of mortality in pediatric chronic kidney disease (CKD) patients. Left ventricular (LV) hypertrophy (LVH) is associated with LV diastolic dysfunction (LVDD) development and LVH is used as early marker of CVD in pediatric CKD. The purpose of this study is to assess the prevalence and risk factors of LVDD and association between LVH and LVDD in Korean pediatric CKD patients.

Methods: The data collection was done by using baseline data of the KoreaN cohort study for Outcome in patients With Pediatric Chronic Kidney Disease (KNOW-Ped CKD), which is a nationwide, 10-year, prospective, observational cohort study of pediatric CKD. Total 244 patients were included in the final analysis. Two-dimensional echocardiography and tissue Doppler image were used to evaluate LVH and LVDD. The LVH was defined as LV mass index (LVMI) ≥ 38g/$m^{2.7}$ and LVDD was defined as mitral peak velocity of early filling to early diastolic mitral annular velocity (E/E') > 14.

Results: In this study, male-to- female ratio was 2.2 (168:76), an average age was 10.4 years, average estimated GFR was 57.42ml/min/1.73m^2 and none of patients received renal replacement therapy. The mean value of LVMI was 37.04 g/$m^{2.7}$ and E/E' was 7.43. The prevalence of LVH was 40.1% (97/242) and LVDD was 4.5% (11/244) and patient with LVH showed greater risk of LVDD (OR 7.4, p=0.005). In univariate analysis, young age, low hemoglobin level, higher LVMI were associated with LVDD. In multivariate analysis, low hemoglobin was independently associated with LVDD.

Conclusions: This study shows the greater risk of LVDD in patients with LVH and the anemia was the only modifiable risk factor for LVDD prevention in Korean pediatric CKD patients.