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Longitudinal changes of cardiac structure and function in pediatric chronic kidney disease - Results from the KoreaN cohort study for Outcomes in patients With Pediatric Chronic Kidney Disease (KNOW-Ped CKD)

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Objectives: Cardiovascular disease (CVD) is the leading cause of mortality in pediatric chronic kidney disease e-e(CKD) patients. Monitoring cardiac structure and function is necessary to prevent CVD. This study aims to show the longitudinal change of echocardiographic measurement in Korean CKD children.

Methods: The data collection was done by using baseline and five-year follow-up 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. Among the participants, 186 patients had both baseline and follow-up echocardiography data. Following echocardiographic measurements were collected to evaluate cardiac structure, systolic and diastolic function; ejection fraction (EF), LV mass (LVM), fractional shortening (FS), late diastolic mitral inflow velocity (A), mitral peak velocity of early filling (E), and early diastolic mitral annular velocity (E'). The LVH was defined as LV mass index (LVMI) ≥ 38g/$m^{2.7}$ and LVDD (left ventricular diastolic dysfunction) was defined as E/E' > 14. Paired t-test (or Wilcoxons sign rank test) and McNemar test was used for statistical analysis.

Results: Male was predominant in this cohort (69.4%). Mean age and eGFR at baseline and follow-up were 9.5 and 14.5 years and 64.2 and 61.5mL/min/1.73m^2, respectively. In five years of follow-ups, statistically significantly, LVMI increased though the prevalence of LVH (40.3% vs. 28.0%) decreased. The systolic function showed no statistically significant changes. The diastolic function represented by E/A and E/E' ratio showed a statistically significant decrease. Even though the prevalence of LVDD (6.4% vs. 3.6%) decreased, it was not statistically significant.

Conclusions: The prevalence of LVH and diastolic functional values decreased in pediatric CKD patients during follow-up. The improvement of LVH and diastolic function might have been influenced by CKD management during the follow-up period. Further study is needed to evaluate the reasons for LVH and diastolic function improvement.