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Serum uric acid levels in children with chronic kidney disease: data from KNOW-PedCKD

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Objectives: The association between hyperuricemia and chronic kidney disease (CKD) has gained intense interest. We aimed to identify the factors associated with serum uric acid levels in pediatric CKD patients.

Methods: We used the baseline data of the KoreaN cohort study for Outcome in patients With Pediatric Chronic Kidney Disease (KNOW-Ped CKD). A total of 338 patients under the age of 17 who did not use uric acid lowering medications were included. Uric acid levels were categorized as < 5.5 (low group), 5.5 to 7.5 (intermediate group), and >7.5 mg/dL (high group).

Results: Median age was 9.5 [4.5, 14.1] years and boys accounted for 66.3% (Table). Median eGFR was 61.0 [37.9;84.9] ml/min/1.73 m^2. CKD was caused by glomerulonephropathy in 24.9%. Median serum uric acid level was 5.8 [4.5; 7.1] mg/dL. The low, intermediate, and high groups were 142, 129, and 167, respectively. The 3 groups had similar distributions of sex, CKD etiology, BMI z-score, lipid levels, and diuretic use. The high group was older ($p < 0.001$) and had lower eGFR ($p < 0.001$), more anemia ($p < 0.001$), lower calcium levels ($p < 0.001$), higher parathyroid hormone levels ($p < 0.001$), more urine protein/creatinine ratio ≥ 2 mg/mg ($p = 0.038$), and lower fraction excretion of uric acid ($p < 0.001$). The intermediate group had less hypertension ($p = 0.011$). Echocardiography showed that the intermediate group had higher early diastolic annular velocity ($p = 0.031$), and less left ventricular mass index ($p < 0.001$).

Conclusions: Higher serum uric acid levels were associated with older age, lower eGFR, and higher proteinuria and not with CKD etiology and obesity. CKD patients with uric acid levels between 5.5 and 7.5 mg/dL had less hypertension and better echocardiogram results.

table