

만성콩팥병 환자에서 24시간 뇨 칼슘과 관련있는 인자 탐색: KNOW-CKD 연구

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The association Factors for 24-hour Urinary Calcium in Chronic Kidney Disease Patients: KNOW-CKD Study

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Objective: Chronic kidney disease (CKD) patients have lower urinary calcium excretion compare to normal population. Bone mineral metabolism is important in CKD patients. It is associated with cardiovascular complications. Here, we explored the association factors for urinary calcium and association between urinary calcium and cardiac parameters in Korea CKD patients.

Methods: We analyzed 1,300 CKD patients with 24-hr urine collection at baseline from the prospective KoreaN Cohort Study for Outcome in Patients With Chronic Kidney Disease (KNOW-CKD) study. 24-hr urine calcium (UCa) was divided into tertiles. We used multivariable linear regression to analyze the association factors with UCa. In subgroup analysis, we analyzed the association of UCa with arterial stiffness and arterial calcification. Mean of right and left brachial-to-ankle PWV (baPWV) was used as a marker of arterial stiffness. Coronary artery calcification score (CACS) by CT scan was used as a marker of arterial calcification.

Results: Participants were 53.4±12.4 years and 60.6% were male. Median UCa value was 45.0 (Interquartile range, 22.0, 95.0) mg/day. UCa decreased according to CKD stage ($p<0.001$). Patients in the 3rd tertile ($n=433$, 72.5-687.2 mg/day) were younger and had higher estimated glomerular filtration rate (eGFR), 25(OH)Vitamin D, 1,25(OH)₂ Vitamin D, 24-hr urine volume, 24-hr urine Na, estimated protein intake, and lower iPTH. In a multivariable linear regression adjusted with age, eGFR, HTN, DM, hemoglobin, corrected Ca, P, uric acid, 25(OH)VitD, 1,25(OH)₂VitD, iPTH, 24-hr urine Na, 24-hr urine P, 24-hr urine volume, estimated protein intake, UCa was mostly associated with eGFR (B coefficient, 0.005; 95% confidence interval: 0.004 to 0.006; $p<0.001$). The 24-hr urine Na (B coefficient, 0.001; 95% CI, 0.001-0.002; $p<0.001$) and 25(OH)VitD (B coefficient, 0.330, 95% CI, 0.187-0.472; $p<0.001$). There was no significant association of UCa with baPWV and CACS, with or without active vitamin D or calcium-based phosphate binder medication.

Conclusion: UCa was independently associated with eGFR in KNOW-CKD population. Further studies are warranted to the influence of lower UCa in CKD patients.

Key Words: 뇨 칼슘, 만성 콩팥병, 사구체 여과율

Urine calcium, Chronic kidney disease, GFR