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Urine potassium excretion, blood pressure variability, and cardiovascular outcomes in CKD

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Objectives: The association of urine potassium excretion with blood pressure variability (BPV) and cardiovascular outcomes has not been investigated in patient with CKD.

Methods: A total of 1860 participants from the Korean Cohort Study for Outcome in Patients With Chronic Kidney Disease (KNOW-CKD) were divided into the quartiles by spot urine potassium-to-creatinine ratio. The 1st quartile was defined to be low urine potassium excretion. The association of urine potassium excretion with BPV was analyzed by multivariate linear regression, while the association of urine potassium excretion with extended major cardiovascular event (eMACE) as well as all-cause mortality was analyzed by Cox proportional hazard regression.

Results: Multivariate linear regression analyses revealed an independent association between low urine potassium excretion and greater BPV in CKD patients [Adjusted coefficient 0.768 (95% confidence interval (CI) 0.082-1.454)]. Cox proportional hazard regression analyses demonstrated a significant association of low urine potassium excretion with the risk of eMACE [Hazard ratio (HR) 2.509 (95% CI 1.120-5.622), but not with all-cause mortality [HR 0.820 (95% CI 0.419-1.606)]. The association between low urine potassium excretion and the risk of eMACE was more prominent in vulnerable subjects, such as those with eGFR < 45 mL/min/1.73m^2 [HR 3.143 (95% CI 1.094-9.028)], age ≥ 60 years [HR 8.175 (95% CI 1.732-38.595)], medication of diuretics at the baseline [HR 6.213 (95% CI 1.371-28.147)], and urine albumin-to-creatinine ratio ≥ 300 mg/g [HR 5.382 (95% CI 1.639, 17.674)].

Conclusions: Low urine potassium excretion is associated with greater BPV and the risk of eMACE in patients with CKD. Dietary potassium intake should not be too much restricted even in patients with advanced CKD.Low urine potassium excretion is associated with greater BPV and the risk of eMACE in patients with CKD. Dietary potassium intake should not be too much restricted even in patients with advanced CKD.