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Association between urine sodium to potassium ratio and control of hypertension in Korean Adults: From the Korea National Health and Nutrition Examination Survey 2007 to 2020

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Objectives : Hypertension (HTN) is a major risk factor for cardiovascular disease (CVD) and chronic kidney disease (CKD). Effective management of blood pressure (BP) is crucial in reducing the risk of both CVD and CKD. The urine sodium-to-potassium (Na/K) ratio is a measure that reflects the balance between sodium and potassium excretion in urine and has been associated with various health outcomes. Our study aimed to explore the relationship between urine Na/K ratio and BP control.
Methods : We analyzed data from 4770 subjects aged 19 years and older, diagnosed with hypertension, obtained from the nationally representative Korea National Health and Nutrition Examination Survey (2007–2020). Uncontrolled hypertension was defined as systolic blood pressure exceeding 140 mmHg or diastolic blood pressure exceeding 90 mmHg.
Results : In a study involving 4770 patients, 1600 patients were found to have uncontrolled blood pressure. The urine Na/K ratio was significantly higher in the uncontrolled group (2.74 ± 1.7 mmol/L; mean ± SD) compared to the controlled group (1.6 ± 1.7 mmol/L; mean ± SD) ($p < 0.001$). However, there was no significant difference in sodium intake between the uncontrolled group (2,952 ± 2,952 mmol/L; mean ± SD) and the controlled group (4,170 ± 3,107 mmol/L; mean ± SD) ($p = 0.130$). Logistic regression analysis was performed, which revealed a significant association between urine Na/K ratio and uncontrolled hypertension even after adjusting for confounding factors, (OR [95% CI], 1.14 [1.11–1.18], $P < 0.001$). Only CKD patient's Logistic regression analysis was performed, which revealed a significant association between urine sodium to potassium ratio and uncontrolled hypertension even after adjusting for confounding factors OR [95% CI], 1.27 [1.14–1.41] $P < 0.001$).
Conclusions : Our study of patients with HTN suggests that the urine Na/K ratio may be a useful biomarker for HTN control.