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The effect of uric acid and urinary sodium excretion on prehypertension : A nationwide population-based study

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Objectives: This study aimed to examine effect of serum uric acid (SUA) and urinary sodium excretion on blood pressure (BP), as well as its synergistic effect on prehypertension in Korean population.

Methods:

Data from 7th Korea National Health and Nutrition Examination Survey for adults ≥ 19 years old were used. The participants were classified as normotension or prehypertension according to JNC 7 definition. Logistic regression was carried out and adjusted for traditionally regarded confounders for BP. All analyses considered a complex sampling design, and multivariate analysis was performed in the subgroups based on SUA and urinary sodium excretion level.

Results: A total of 4,200 individuals (normotension, $n=2,646$; prehypertensions, $n=1,554$) are included in the analyses. In the univariate analysis, age, male, concurrent comorbidity including diabetes mellitus, cardiovascular disease, stroke, dyslipidemia, chronic kidney disease, uric acid, and urinary sodium excretion were associated with prehypertension. After adjusting for baseline covariates, both SUA and urinary sodium excretion were significant predictor for incident prehypertension (Serum uric acid, per 1mg/dL increased, Odds ratio (OR) 1.216, 95% CI 1.131 - 1.309; Urinary sodium excretion, per 1g/day increased, OR 1.067, 95% CI 1.019 - 1.117). Additionally, simultaneous higher tertile of both SUA and urinary sodium excretion had higher odds ratio for prehypertension.

Conclusions: Increased SUA is a significant risk marker for developing prehypertension from normotension. Moreover, simultaneous high SUA and urinary sodium excretion amplifies the effect on developing prehypertension. Thus, findings of this study suggest to need the effort for lowering serum uric acid and reducing sodium intake to prevent hypertension.