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Association of Low Blood Pressure with the Development of Chronic Kidney Disease in the General Population without Antihypertensive Medication

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Objectives: Mounting evidences continuously reported that strict blood pressure (BP) control is associated with increased development of chronic kidney disease (CKD). However, most of those were conducted with patients taking antihypertensive drugs, and the relationship between BP and incident CKD remains controversial in those without medication. Therefore, we aimed to investigate the association of low BP with the development of CKD in the general population without antihypertensive medications.

Methods: This prospective cohort study was conducted with 7,504 individuals without antihypertensive medications at baseline in the Korean Genome and Epidemiology Study. Subjects were categorized into six groups according to systolic BP (SBP) and five groups according to diastolic BP (DBP), respectively. Primary outcome was incident CKD, which was defined as estimated glomerular filtration rate (eGFR) <60 mL/min/1.73m² and/or development of proteinuria.

Results: The median age was 49 (interquartile range 44-59) years and 3,698 (49.3 %) subjects were men. During a median follow-up of 139 months, a total of 625 (8.3%) events occurred. The risk of CKD was significantly higher in a group of SBP <100 mmHg (hazard ratio [HR], 1.71; 95% confidence interval [CI], 1.13-2.61; *P* = 0.012) compared to the normal group (SBP 100-119 mmHg). When DBP 70-79 mmHg was set to the normal range, the group with DBP <70 mmHg was also associated with increased CKD risk (HR, 1.492; 95% CI, 1.073-2.076; *P* = 0.018). Cubic spline curves showed that the lowest hazard of CKD was shown at the point of SBP 112 mmHg and DBP 75 mmHg, respectively.

Conclusions: Low BP was independent risk factor of CKD development in the general population without antihypertensive medication.