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The Association between Longitudinal Blood Pressure Trajectory and Progression of Chronic Kidney Disease: Results from KNOW-CKD

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Objectives: Blood pressure (BP) control is important in management of chronic kidney disease (CKD). However, studies on longitudinal temporal trend of BP and its impact on kidney function are scarce. Here, we evaluated the association of dynamic in SBP over time with CKD progression in Korean CKD patients.

Methods: We analyzed a total of 1,863 participants with CKD from the KoreaN cohort study for Outcome in patients with CKD (KNOW-CKD), a prospective community-based cohort study. Key exclusion criteria were 1) less than 2 follow-up visits, 2) occurrence of composite outcome within 1 year, and 3) missing data for BP. We identified three distinct SBP trajectories using latent mixed model; decreasing, stable, and increasing SBP. The primary outcome was a composite of halving eGFR from baseline value or the onset of end-stage kidney disease.

Results: During 7354 person-years of follow-up (median 3.9 years), the composite outcome occurred in 441 (23.7%) participants. There were fewer primary outcome events in decreasing (24.1%) and stable (22.4%) SBP trajectories than in increasing trajectory (28.2%). In multivariable Cox analysis after adjustment of confounders, increasing SBP trajectory was associated with an 1.34-fold higher risk of CKD progression compared with those with stable SBP trajectory. This was particularly evident in patients with eGFR ≤60 ml/min/1.73 m^2, diabetes, BMI <25kg/m^2, and SBP ≥120 mmHg.

Conclusions: In this longitudinal cohort study, increasing SBP over time was associated with higher risk of CKD progression in CKD patients.