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Optimal Target for Blood Pressure Control in Patients with Chronic Kidney Disease: The results from the KNOW-CKD study

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Objectives : There has been a long debate regarding what level blood pressure (BP) should be lowered to in patients with chronic kidney disease (CKD). This study aimed to investigate the optimal target BP levels to retard the progression of CKD in participants in the KoreaN cohort study for Outcome in patients With Chronic Kidney Disease (KNOW-CKD).

Methods : Between February 2011 and July 2016, a total of 2,238 patients were enrolled. After excluding 22 patients in whom systolic blood pressure (SBP) was not measured, 2,226 patients were included in the analysis. Patients were categorized into 7 groups according to baseline SBP levels; <110, 110-119, 120-129, 130-139, 140-149, 150-159, and ≥160 mmHg. Primary outcome was a composite renal of a 50% decline in estimated glomerular filtration rate, or end stage renal disease.

Results : The mean age of the patients were 53.6 years and 1,362 (61.2%) were male. At enrollment, 2,138 (96%) had hypertension and the mean SBP was 127.9±16.2 mmHg. During a mean follow up of 36.7 months, primary outcome occurred in 334 (15.0%) patients. There were increases in the number of the composite outcome as SBP increased (P for trend < 0.001). In a multivariate Cox analysis after full adjustment for confounding factors including age, sex, body mass index, smoking status, comorbidities, use of antihypertensive agents, eGFR, and overt proteinuria, SBP of < 110 mmHg [hazard ratio (HR), 0.52; (95% confidence interval (CI), 0.31-0.87, P=0.012] and SBP of 110-119 mmHg (HR, 0.62; 95% CI, 0.42-0.91; P=0.015) were significantly associated with a lower risk of the composite endpoint as compared to SBP of 130-139 mmHg. In contrast, HRs for the composite outcome were significantly higher in

patients with SBP of 150 to 159 mmHg (HR, 1.47; 95% CI, 1.00–2.15; P=0.049) and those with SBP of ≥ 160mmHg (HR, 2.00; 95% CI, 1.30–3.09; P=0.002) than in patients with SBP of 130–139 mmHg. There was no difference in the risk of primary outcome between SBP categories of 120–129, 130–139, and 140–149 mmHg.

Conclusions : In this study, we found a significant linear relationship between SBP and adverse renal outcomes in patients with CKD. Thus, lowering the target BP below the levels proposed by the current guideline may be beneficial to attenuate deterioration of kidney function.

Keywords : Chronic kidney disease, blood pressure, optimal target