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Time-in-target range of systolic blood pressure and all-cause mortality in chronic kidney disease population in Korea

Soo-Young Yoon, Hyun Kyu Kim, Jeong-Yeun Lee, Dae Kyu Kim, Jin Sug Kim, Hyeon Seok Hwang, Kyunghwan Jeong

Department of Internal Medicine-Nephrology, Kyung Hee University Medical Center, Korea, Republic of

Objectives : Time-in-target range (TTR) of systolic blood pressure (SBP) is the percentage of time that SBP remains within the range of 110–130 mmHg. The TTR metric can be used to express the degree of SBP control over time. The association between SBP-TTR and mortality in patients with chronic kidney disease (CKD) remains unclear, and may depend on the extent of its control. We evaluated the risk of mortality, cardiovascular events, and renal events between SBP-TTR groups in Korea.

Methods : A total of 16,037 patients with CKD who underwent health check-ups at least three times between 2012 and 2015 were recruited from the Korean National Health Insurance Database. The patients were divided into four SBP-TTR categories based on SBP-TTR levels: SBP-TTR 100%, SBP-TTR 51–75%, SBP-TTR 26–50%, and SBP-TTR 0–25%. The primary outcome was the association between SBP-TTR level and mortality by Cox-regression analysis. Secondary outcomes were cardiovascular risk and end-stage kidney disease (ESKD) progression based on SBP-TTR groups.

Results : The median eGFR in the study was 56.08 ml/min per 1.73m². The adjusted hazard ratios (HRs) were 1.17 (95% confidence interval [CI], 0.96–1.41), 1.21 (95% CI, 0.998–1.47), and 1.23 (95% CI, 1.02–1.49) for patients with SBP-TTR 51–75%, 26–50%, and 0–25%, respectively. The adjusted HRs for cardiovascular events increased significantly as the SBP-TTR decreased below 50%. For SBP-TTR 26–50%, the adjusted HR was 1.19 (95% CI, 1.01–1.40), and for SBP-TTR 0–25%, the adjusted HR was 1.40 (95% CI, 1.19–1.64). The adjusted HRs for ESKD progression increased gradually: 1.22 (1.01–1.47) for SBP-TTR 51–75%, 1.28 (1.05–1.56) for SBP-TTR 26–50%, and 1.80 (1.50–2.16) for SBP-TTR 0–25%.

Conclusions : Among patients with CKD, those with a low SBP-TTR showed an increased risk of mortality, cardiovascular events, and progression to ESKD.