KSN 2017 Abstract

KSN-17-O064

Association between Time-updated Systolic Blood Pressure and the Incident Chronic Kidney Disease: A Nationwide Cohort Study

Tae ik CHANG[1], Ea wha KANG[1], Jung tak PARK[2], Tae-hyun YOO[2], Shin-wook KANG[2], *Seung hyeok HAN[2]

[1]Department of Internal Medicine, NHIS Medical Center, Ilsan Hospital, Korea,South, [2]Department of Internal Medicine, Yonsei University College of Medicine, Korea,South

Objectives : Elevated systolic blood pressure (SBP) is associated with an increased risk of developing chronic kidney disease (CKD), end-stage renal disease, cardiovascular events, and death. However, most studies have significant shortcomings because the analyses were performed using a single measurement of BP and other important factors relevant to clinical outcomes, thus did not fully account for changes in these parameters over time.

Methods : The National Health Insurance Service National Health Checkup Cohort consists of a nationwide representative sample of 182,029 adults in Korea between 2009 and 2013. We included individuals who had an estimated glomerular filtration rate (eGFR) of ≥60 mL/min per 1.73m2 and measured SBP at baseline, and underwent at least ≥3 of eGFR measurements during follow-up period. To delineate association between SBP over time and the incident CKD, we used time-varying cox proportional hazard regression models. CKD was defined as de novo development in eGFR of <60 mL/min per 1.73m2 for at least two consecutive measurements or a ≥30 % decline in eGFR from the baseline.

Results : During a median (inter-quartile range) follow-up of 3.9 (3.3 to 4.1) years, CKD occurred in 4,786 (2.6%) individuals and a crude event rate was 7.2 (95% confidence intervals, 7.0 to 7.4) per 1,000 patient-years. In time-varying models adjusted for age, gender, comorbidities, baseline eGFR, body mass index, and laboratory parameters (total cholesterol, hemoglobin, and proteinuria) over time, there was a relatively linear relationship between SBP and risk of CKD development. Compared to individuals with SBP of 120 to 129 mmHg, hazard ratios (95% confidence intervals) in those with SBP of <110,110 to <120, 130 to <140, 140 to <150, 150 to <160, and ≥160 mmHg were 0.81 (0.72-0.92), 0.96 (0.88-1.05), 1.11 (1.02-1.20), 0.98 (0.88-1.10), 1.16 (1.02-1.32), and 1.46 (1.27-1.69), respectively. A cubic spline model after full adjustment of confounding factors again confirmed this association.

KSN 2017 Abstract

Conclusions : In this large-scale nationwide cohort study, there was a significant graded linear association between SBP over time and risk of CKD development. The risk increased in individuals with SBP of ≥150 mmHg, while those with SBP of <110 mmHg had the lowest risk.

Keywords : Systolic blood pressure, chronic kidney disease