KSN SEOUL, KOREA 2023
April 27(Thu) - 30(Sun), 2023
Coex, Seoul, Korea

Abstract Type : Oral
Abstract Submission No. : 1584

Association of Polygenic Risk Scores for Blood Pressure with Incident Hypertension

Soyeon Kim[1], Na Yeon Kim[2], Seunggeun Lee[2], Soon Hyo Kwon[1], Hyunjin Noh[1], Jin Seok Jeon[1], Hyoungnae Kim[1], Haekyung Lee[1]
[1]Department of Internal Medicine-Nephrology, Soonchunhyang University Seoul Hospital, Korea, Republic of
[2]Department of Graduate School of Data Science, Seoul National University, Korea, Republic of

Objectives: Genetic risk for elevated blood pressure (BP) has been associated with an increased risk of hypertension or cardiovascular disease. The lack of studies among Asian populations, however, limits the generalizability of earlier findings. We aimed to investigate whether BP genetic risk enables the early identification of hypertension risk.

Methods: We constructed polygenic risk scores (PRSs) for systolic and diastolic BP (SBP and DBP, respectively) using the using genome-wide association data from the Biobank Japan by applying PRS-CS, and we then assessed the association between BP PRSs and incident hypertension in the Korean Genome and Epidemiology Study. Participants without hypertension, cardiovascular disease, and chronic kidney disease at baseline were included (n = 4351, median age 48 years, 48.8% men). Participants were categorized into four groups based on their PRS percentile (<5%, 5-50%, 50-95%, >95%).

Results: The PRS for SBP and DBP was independently associated with SBP and DBP, respectively (both P <0.001). Compared with having the lowest 5% SBP PRS, a SBP PRS in the 50 to 95 percentile range and in the highest 5% conferred 1.62-fold (95% confidence interval [CI], 1.24–2.11; P <0.001) and 1.75-fold (95% CI, 1.23–2.49, P = 0.002) higher risk of hypertension, respectively. Elevated DBP PRS was associated with 1.47-fold (95% CI, 1.11–1.94, P = 0.006), 1.79-fold (95% CI, 1.35–2.35, P <0.001), and 2.03-fold (95% CI, 1.41–2.91, P <0.001) higher risk of hypertension in the 5 to 50 percentile, the 50 to 95 percentile, and the highest 5%, respectively. The highest PRS percentile for SBP and DBP was associated with 5.9 years (95% CI, 2.9–8.9) and 6.7 years (95% CI, 3.9–9.4) earlier onsets of hypertension than the lowest PRS percentile of SBP and DBP, respectively.

Conclusions: Genetic risk for elevated BP was associated with higher incident hypertension risk and earlier hypertension onset in the general population.