



Development of a Korean-specific cardiovascular risk model in a cohort at high-risk of hypertension

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Cardiovascular disease (CVD) is the leading cause of death worldwide, and hypertension (HTN) increases the risk of CVD [1]. HTN, which is associated with ischemic heart disease, stroke, chronic kidney disease, and overall mortality, is one of the most important and modifiable CVD risk factors. Over the past 50 years, considerable research has been conducted to determine the optimal target blood pressure (BP), to reduce CVD risk and mortality associated with various comorbidities, including heart failure, stroke, and diabetes, and across different world regions [2-5]. Ethnic differences in CVD risk and mortality are well documented [6]. The risk of stroke is higher in Asian populations than in Western countries, and the relationship between BP and stroke incidence is stronger in Asian populations than in Western populations [7].

A recent landmark clinical study, the Systolic Blood Pressure Intervention Trial (SPRINT) sponsored by the United States National Institutes of Health has received considerable attention [8]. The study found that, compared with standard BP control (systolic BP < 140 mmHg), treating to a lower target systolic BP of < 120 mmHg reduced CVD incidence and mortality among patients at high risk of CVD (without dia-

betes or a history of stroke), reduced the primary CVD composite outcome by 25%, and reduced all-cause mortality by 27%. After publication of these findings, most guidelines recommended strict BP control to maximally reduce the risk of CVD in high-risk patients. However, most of the patients (about 90%) in the SPRINT study were of Caucasian or African descent and fewer than 2% were Asian. Few clinical studies have investigated the effects of intensive BP control in Asian patients. Furthermore, the SPRINT study included high-risk patients with a 15% or greater 10-year risk of CVD based on the Framingham risk score. It is well documented that the Framingham risk score may overestimate the CVD risk in Asians [7,9]. The fact that the CVD risk differs between Western and Asian populations, and that an optimal CVD risk score based on real-world data in Asians has not been determined, point to the need for a CVD risk prediction model developed for Asian populations.

In this issue of the *Korean Journal of Internal Medicine*, Lee et al. [10] described the design and baseline characteristics of the Korean Hypertension Cohort (KHC) study. The study enrolled patients diagnosed with HTN from six national university hospitals between 2006 and 2011. Detailed clinical information from each hospi-

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tal was integrated with long-term follow-up data over a period of approximately 9 years obtained from the National Health Insurance System (NHIS) claims database. A non-HTN control population in a 1:10 ratio (100,000) was obtained from the NHIS sample cohort using propensity score matching. The primary objective of the KHC study was to evaluate the long-term impact of intensive BP control, which maintained systolic/diastolic pressures at < 135/85 mmHg, and to compare the findings with the moderate control group (systolic BP, 140 to 149 mmHg). The study enrolled 11,083 patients with HTN (mean age, 58.8 years; males, 50.5%) including 31.4% with never-treated HTN. In total, 32.9% of the participants were in the moderate cardiovascular risk group and 37.7% were in the high-risk group. Treatment with 1.9 tablet doses of antihypertensive medication reduced baseline BPs of 149.4/88.5 mmHg to 130.8/78.0 mmHg over the 2-year hospital follow-up period. Cardiovascular events occurred in 7.5% of patients overall; 8.5%, 8.8%, and 4.7% in the high-, moderate-, and low-risk patients, respectively. Although the information provided by this nationwide cohort study is timely and important, it has some limitations. First, the authors do not discuss the white-coat and masked HTN phenomena, which may lead to false BP readings in the clinical setting. Second, BP measurement protocols were not standardized, which the authors acknowledged. Third, a high proportion of the high-risk patients were recruited from tertiary referral university hospitals; therefore, the findings of the study may not be generalizable to all Korean patients with HTN.

As the first ever nationwide high-risk HTN cohort study, the ongoing results of the KHC study will provide important real-world data on the long-term outcomes of Korean patients with HTN according to BP values, comorbid diseases, medication and adherence, as well as health behaviors and use of health resources. Finally, the findings of the study may help establish a CVD risk score for Korean patients with HTN that may be applicable to other Asian populations.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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