

## Editorial



# Control Rates of Systolic and Diastolic Blood Pressure among Hypertensive Adults in Korea

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► See the article “Differential Control Rate of Systolic and Diastolic Blood Pressure among Korean Adults with Hypertension: the Sixth Korean National Health and Nutrition Examination Survey, 2013–2015 (KNHANES VI)” in volume 49 on page 1035.

## OPEN ACCESS

**Received:** Jun 26, 2019

**Accepted:** Jul 3, 2019

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### Conflict of Interest

The author has no financial conflicts of interest.

The contents of the report are the author's own views and do not necessarily reflect the views of the *Korean Circulation Journal*.

Despite extensive evidence from observational studies demonstrating that hypertension is a major risk factor for cardiovascular mortality and morbidity and evidence from randomized controlled trials demonstrating that the risk of hypertension can be substantially reduced by antihypertensive medication, hypertension is still considered to be poorly managed. For decades, more effective antihypertensive drugs with less adverse effects have become available, and public healthcare services have placed more emphasis on cardiovascular disease prevention; therefore, we should expect better awareness, treatment, and control for hypertension. Based on a report from the Korean Society of Hypertension, the rates of awareness, treatment, and control have increased from 25%, 22%, and 5% in 1998 to 65%, 61%, and 44% in 2016, respectively. However, this indicates that more than half of Korean hypertensives are poorly controlled.<sup>1</sup> Given the different pathophysiology of systolic and diastolic blood pressure (DBP), it remains unclear whether poor rates of hypertension control are because of a lack of systolic blood pressure (SBP) control, lack of DBP control, or both, and this issue is of significant clinical interest.

In this issue of the *Korean Circulation Journal*, Cho et al.<sup>2</sup> sought to determine the rates of blood pressure (BP) control to a SBP goal (defined as SBP <140 mmHg), a DBP goal (defined as DBP <90 mmHg), and to both goals (defined as SBP <140 mmHg and DBP <90 mmHg) across age and sex groups, and to identify covariates associated with BP control among Korean hypertensive adults. The authors used data from the Korean National Health and Nutrition Examination Survey (KNHANES) in 2013–2015.<sup>2</sup> The rate of BP control to both systolic and diastolic goals was higher in older patients. However, interestingly, this trend was likely influenced by a gradually worse SBP control rate and improved DBP control rate with aging. In other words, poor BP control was overwhelmingly secondary to a lack of SBP control among older hypertensive patients and to a lack of DBP control among younger hypertensive patients. The authors commented that these differences in the control rates between SBP and DBP related to older age would have been overlooked in the overall BP control rate to both SBP and DBP goals. The findings by Cho et al.<sup>2</sup> confirm the relatively low rates of hypertension control described in the previous report from KNHANES<sup>1</sup> and in another Korean study using community surveillance data,<sup>3</sup> by focusing on the differential attainment of SBP and DBP goals and by highlighting the factors associated with BP control. Aging was

the characteristic most significantly associated with lack of SBP control. The finding makes sense based on the fact that increased SBP is generally characterized as a phenomenon of aging because SBP, unlike DBP, increases with age in response to increased arterial stiffness and losses in arterial compliance.<sup>4)</sup>

Obesity is generally considered to be associated with poor BP control. For example, data from the National Health and Nutrition Examination Survey in the United States indicated that, among hypertensive individuals, obesity (defined as body mass index [BMI]  $\geq 30$  kg/m<sup>2</sup>) was associated with a lack of SBP or DBP control compared with normal weight (BMI  $< 25$  kg/m<sup>2</sup>).<sup>5)</sup> However, the authors found an inverse association between waist circumference and unfavorable BP control rate that did not reach statistical significance, and the authors saw no clear trend between BMI and BP control rate among Korean hypertensives. As an explanation, the authors suggested that central obesity rather than high BMI may be more closely associated with high BP. In other words, body mass index is a widely-utilized and practically-obtained index; however, waist circumferences may better characterize obesity and metabolic health regarding BP control.<sup>6)</sup> Additionally, considering that the obesity burden in the Korean population is generally lower than in western countries, an association between obesity parameters and BP control may not be evident.

In 2017, the American College of Cardiology (ACC)/American Heart Association (AHA) issued BP management guidelines with a new definition of hypertension as SBP  $\geq 130$  mmHg and DBP  $\geq 80$  mmHg.<sup>7)</sup> Previously, hypertension was defined as SBP  $\geq 140$  mmHg and/or DBP  $\geq 90$  mmHg, while a SBP of 130–139 mmHg and/or a DBP of 80–89 mmHg was defined as prehypertension. The new ACC/AHA hypertension guidelines also recommend target BP levels of SBP  $< 130$  mmHg and DBP  $< 80$  mmHg for all hypertensive patients independent of age, comorbidity, and estimated cardiovascular risk. Despite this change, the new European, Canadian, Korean, Japanese, and Latin American guidelines for the management of hypertension in 2018–2019 retained the existing hypertension definition of SBP  $\geq 140$  mmHg and/or DBP  $\geq 90$  mmHg.<sup>8–10)</sup> However, these new guidelines commonly recommend stricter BP control than recommended in their previous versions. For example, in the 2019 Japanese Society of Hypertension guidelines, the target BP is a SBP  $< 130$  mmHg and DBP  $< 80$  mmHg for hypertensive adults aged  $< 75$  years and for those with high cardiovascular risks such as those with a history of stroke or coronary heart disease, chronic kidney disease, or diabetes mellitus. Further studies are warranted to investigate the rates of BP control to the new goals based on the recommendation of more intensive BP lowering.

Korean hypertension control rates, based on the national survey of Korean populations, have improved to approximately 40%. Nonetheless, more than half of uncontrolled patients with hypertension, higher in the younger population, still reflects a large burden for future cardiovascular disease, which needs to be addressed. Furthermore, the prevalence of hypertension is not decreasing, and population strategies aimed at preventing hypertension deserve higher priority. Multipronged strategies to lower salt and caloric intake and increase physical activity appear critical in this regard.

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