Editorial

Kidney Res Clin Pract 2022;41(1):1-3
pISSN: 2211-9132 • eISSN: 2211-9140
https://doi.org/10.23876/j.krcp.21.263

KIDNEY RESEARCH AND CLINICAL PRACTICE

Blood pressure management in treatment-naïve hypertensive patients

Ji Yong Jung

Division of Nephrology, Department of Internal Medicine, Gachon University Gil Medical Center, Gachon University College of Medicine, Incheon, Republic of Korea

See Article on Page 31–42

Hypertension is very common and can be asymptomatic or mild in the early stages, which can lead to various complications if not managed in a timely manner [1]. Many previous studies have reported that appropriate treatment of hypertension is beneficial to reduce the risk of negative cardiovascular disease (CVD) outcomes, including heart failure, stroke, myocardial infarction, and kidney failure [2]. For this reason, setting an optimal target blood pressure (BP) should be a primary concern. Although there can be inconsistencies among clinicians who treat patients with hypertension, the target BP is 140/90 mmHg or lower, which has been the consensus for a long time [3]. However, based on recent studies that have indicated a lower target BP to be more effective, several guidelines have shown a preference to lower the traditional target BP. A large randomized controlled trial, the Systolic Blood Pressure Intervention Trial (SPRINT), showed that intensive control of systolic BP (SBP) at <120 mmHg reduced the risk of adverse clinical events [4]. Recently, different organization guidelines [5–7] have set the target BP somewhat lower (Table 1). However, since this target BP is a value measured by standardized BP equipment, it tends to be difficult to apply in the outpatient clinic environment in Korea. Therefore, the Korean Society of Hypertension sets the target value somewhat higher in consideration of conventional BP measurement variations [8].

While strict BP control is clearly effective in reducing CVD risk and mortality, the risk of decreased kidney function due to renal hypoperfusion is important to consider when controlling hypertension [9]. Moreover, most previous trials have attempted to find an optimal target BP that can be used in patients prescribed antihypertensive drugs, so they cannot provide information on the appropriate timing of BP management in patients who have not been treated with antihypertensive drugs.

Lee et al. [10] analyzed 7,343 participants to investigate the association between BP and risk of incident chronic kidney disease (CKD) in a large prospective Korean population cohort who had never taken any prior antihypertensive medication. They used data from the Korean Genome and Epidemiology Study (KoGES) in which all participants underwent serial medical examinations (including biannual BP measurement); assessment of current antihypertensive and CVD medication use was based on participants' self-report questionnaires. The primary outcome was

Received: November 8, 2021; **Revised:** November 16, 2021; **Accepted:** November 16, 2021
Correspondence: Ji Yong Jung
Division of Nephrology, Department of Internal Medicine, Gachon University Gil Medical Center, Gachon University College of Medicine, 21 Namdong-daero 774 beon-gil, Namdong-gu, Incheon 21565, Republic of Korea. E-mail: jyjung@gachon.ac.kr
ORCID: https://orcid.org/0000-0003-1271-8012

Table 1. Target blood pressure recommendations for those with underlying comorbidities (mmHg)

Condition	2018 KSH	2108 ESC/ESH	2017 ACC/AHA	2021 KDIGO
General	<140/90	<140/90	<130/80	
		<130/80 (tolerated)		
Elderly (age ≥ 65 yr)	<140/90	<140/80	<130/80	
Diabetes mellitus		<130/80	<130/80	
With CVD	<140/85			
Without CVD	<130/80			
CVD		<130/80	<130/80	
Cardiovascular	≤130/80			
Cerebrovascular	<140/90			
CKD		<140/80	<130/80	<120 (SBP) (tolerated)
No albuminuria	<140/90			
Albuminuria	<130/80			

All targets were monitored optimally with standardized office blood pressure measurement equipment or automated oscillometric blood pressure monitoring.
ACC/AHA, American College of Cardiology/American Heart Association; CKD, chronic kidney disease; CVD, cardiovascular disease; ESC/ESH, European Society of Cardiology/European Society of Hypertension; KDIGO, Kidney Disease: Improving Global Outcomes; KSH, Korean Society of Hypertension.

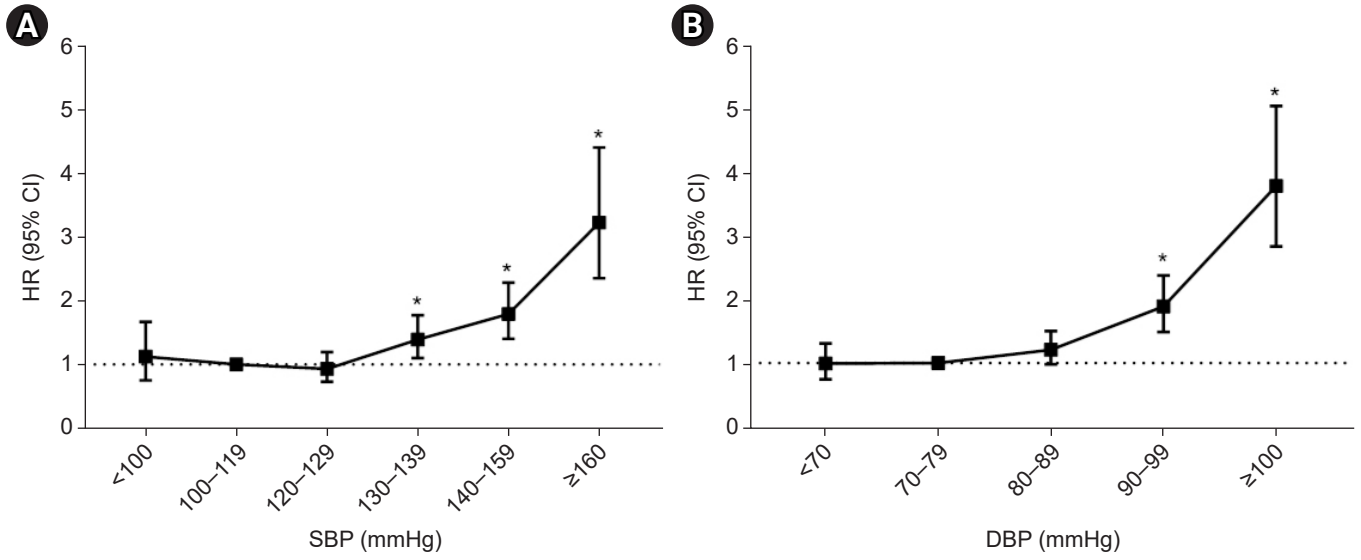

Figure 1. The relationship between blood pressure and incident chronic kidney disease in treatment-naïve participants. An analysis of (A) systolic blood pressure (SBP) and (B) diastolic blood pressure (DBP) as time-varying variables led to creation of a reference group with SBP of 110–119 mmHg and DBP of 70–79 mmHg. The 95% confidence interval (CI) and hazard ratio (HR) for chronic kidney disease occurrence in each group was shown; *p < 0.05. This figure is based on the data in Table 1 of the original article [10].

incident CKD, and they also estimated incident CVD as a secondary outcome. The mean age of the participants was 51 years, and 51% of them were women. BP was measured five times on average during the follow-up period, and the mean SBP and diastolic BP (DBP) reading were 122 ± 17 mmHg and 82 ± 11 mmHg, respectively. Their study divided the participants into six categories according to SBP (<100, 100–119, 120–129, 130–139, 140–159, and ≥160 mmHg) and five categories according to DBP (<70, 70–79, 80–89, 90–99, and ≥100 mmHg). When the BP was considered a time-varying variable, the risk of CKD was increased in patients with SBP of ≥130 mmHg and DBP of ≥90 mmHg (Fig. 1). The lowest CKD risk was identified in people with a time-varying SBP between 100 and 119 mmHg, and CKD hazard was nearly constant in those with time-varying DBP of <80 mmHg. The incident CVD risk according to BP was similar to the incident CKD risk, as was observed in patients with SBP of ≥130 mmHg and DBP of ≥90 mmHg.

Although the authors used relatively large-scale prospective cohort data with well-managed data, there was a risk of selection bias because patients who were currently taking antihypertensive drugs and patients with a history of CKD and CVD were excluded at the start of the observation. In addition, although the researchers treated BP as a time-varying variable and analyzed it as such, it seems insufficient to represent patient BP data using BP measurements obtained only twice a year. After publication of the SPRINT trial results, there was a consensus on the tendency to decrease the optimal BP target. However, direct application of the results to treatment-naïve individuals requires caution because previous studies have targeted patients who are already taking antihypertensive drugs [4,5,9]. In this regard, the usefulness of this study [10] is to provide information that will help determine the timing of antihypertensive administration to treatment-naïve patients. However, because the target BP falls in the hypertension category, it is unclear why all patients are not prescribed antihypertensive agents. Therefore, it is not possible to provide information on the effectiveness of a therapeutic lifestyle; the only factors that can be assessed are the antihypertensive agent and the application period. In addition, the authors found an interaction between patient outcomes and age category through stratification analysis and reported that patients under 60 years of age with hypertension had increased risk of negative clinical outcomes. In addition to the low rates of awareness and treatment of hypertension, many elderly patients who had high risk of comorbidities were excluded at baseline, so a relatively good result could possibly have been obtained during the observation period.

In summary, Lee et al. [10] suggested that SBP of ≥130 mmHg or DBP of ≥90 mmHg was associated with an increased risk of incident CKD in hypertension treatment-naïve individuals. Therefore, while those BP readings are meaningful in suggesting the starting point of treatment to prevent the onset of CKD in this population, they do not provide an appropriate target during treatment. Thus, additional research is needed to determine the optimum BP for patients undergoing hypertension treatment.

Conflicts of interest

The author has no conflicts of interest to declare.

ORCID

Ji Yong Jung, https://orcid.org/0000-0003-1271-8012

References

1. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet* 2005;365:217–223.
2. Hsu CY, McCulloch CE, Darbinian J, Go AS, Iribarren C. Elevated blood pressure and risk of end-stage renal disease in subjects without baseline kidney disease. *Arch Intern Med* 2005;165:923–928.
3. Cruickshank JM, Thorp JM, Zacharias FJ. Benefits and potential harm of lowering high blood pressure. *Lancet* 1987;1:581–584.
4. SPRINT Research Group, Wright JT Jr, Williamson JD, et al. A randomized trial of intensive versus standard blood-pressure control. *N Engl J Med* 2015;373:2103–2116.
5. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: a report of the American College of Cardiology/American Hear.
6. Williams B, Mancia G, Spiering W, et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension. *Eur Heart J* 2018;39:3021–3104.
7. Kidney Disease: Improving Global Outcomes (KDIGO) Blood Pressure Work Group. KDIGO 2021 Clinical Practice Guideline for the management of blood pressure in chronic kidney disease. *Kidney Int* 2021;99:S1–S87.
8. Lee HY, Shin J, Kim GH, et al. 2018 Korean Society of Hypertension Guidelines for the management of hypertension: part II-diagnosis and treatment of hypertension. *Clin Hypertens* 2019;25:20.
9. Beddhu S, Greene T, Boucher R, et al. Intensive systolic blood pressure control and incident chronic kidney disease in people with and without diabetes mellitus: secondary analyses of two randomised controlled trials. *Lancet Diabetes Endocrinol* 2018;6:555–563.
10. Lee H, Kwon SH, Jeon JS, Noh H, Han DC, Kim H. Association between blood pressure and the risk of chronic kidney disease in treatment-naïve hypertensive patients. *Kidney Res Clin Pract* 2022;41:31–42.