Review

The Korean Society of Hypertension Guidelines for the Management of Hypertension in 2013: Its Essentials and Key Points

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Key Words

Korean · Guidelines · Hypertension

Abstract

The Korean Society of Hypertension published new guidelines for the management of hypertension in 2013 which fully revised the first Korean hypertension treatment guideline published in 2004. Due to shortage of Korean data, the Committee decided to establish the guideline in the form of an 'adaptation' of the recently released guidelines. The prevalence of hypertension was 28.5% in the recent Korean National Health and Nutrition Examination Survey in 2011, and the awareness, treatment, and control rates are generally improving. However, the risks for cerebrovascular disease and coronary artery disease which are attributable to hypertension were the highest in Korea. The classification of hypertension is the same as in other guidelines. The remarkable difference is that prehypertension is further classified as stage 1 and 2 prehypertension because the cardiovascular risk is significantly different within the prehypertensive range. Although the decision-making was based on office blood pressure (BP) measured by the auscultation method using a stethoscope, the importance of home BP measurement and ambulatory BP monitoring is also stressed. The Korean guideline does not recommend a drug therapy in patients within the prehypertensive range, even in patients with prediabetes, diabetes mellitus, stroke, or coronary artery disease. In an elderly population over 65 years old, drug therapy can be initiated when the systolic BP (SBP) is ≥ 160 mm Hg. The target BP is generally an SBP of <140 mm Hg and a diastolic BP (DBP) of <90 mm Hg regardless of previous cardiovascular events. However, in patients with hypertension and diabetes, the lower DBP control <85 mm Hg is recommended. Also, in patients with hypertension with prominent albuminuria, a more strict SBP control <130 mm Hg can be recommended. In lifestyle modification, sodium reduction is the most important factor in Korea. Five classes of antihypertensive drugs, including angiotensin-converting enzyme inhibitors, β -blockers, calcium antagonists, and diuretics, are equally recommended as a first-line treatment, whereas a combination therapy chosen from renin-angiotensin system inhibitors, calcium antagonists, and diuretics is preferentially recommended.

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Introduction

The Korean Society of Hypertension published new guidelines for the management of hypertension in 2013 which fully revised the first Korean hypertension treatment guideline published in 2004 [1]. A great amount of data from studies performed in Korea is needed to establish a treatment guideline perfectly tailored to our clinical practices; however, in reality, there is currently a serious shortage of available results from Korean studies. Practically speaking, it is difficult to construct an optimal guideline that physicians may apply exclusively to Korean patients. The Committee, therefore, decided to establish a guideline in the form of an ‘adaptation’ of the recently released guidelines including the guideline from the European Society of Hypertension/the European Society of Cardiology [2].

The Prevalence and Clinical Significance of Hypertension in Korea

In the Korean National Health and Nutrition Examination Survey (KNHANES), the age-standardized prevalence of hypertension was approximately 30% among adults aged >30 years of age. The temporal trend of the prevalence of hypertension was 29.9 and 28.6% in 1998 and 2001, respectively. This prevalence decreased slightly in 2007 and 2008 and then increased again in 2011 [3]. Among adults aged 65 years or older, the prevalence increased between 2007 and 2011 from 49.3 to 58.4% in men and from 61.8 to 68.9% in women. The prevalence of prehypertension in 2001 was 39.8% in men and 30.6% in women and decreased slightly to 28.4% in men and 18.8% in women in 2008, similar to the trend in the prevalence of hypertension (table 1).

The Korean Medical Insurance Corporation (KMIC) study enrolled approximately 100,000 male civil officers and private school teachers to evaluate the risk of high blood pressure (BP). The risks for cerebrovascular disease and coronary artery disease which are attributable to hypertension in men were 35 and 21%, respectively [4]. According to the KIMC study, the hazard ratio for cerebrovascular and coronary artery disease during a 6-year follow-up period was 2.6 for the hypertension group relative to the subjects with BP <130/85 mm Hg [5, 6]. In addition, for each 20-mm Hg increase in systolic BP (SBP), the relative risks of ischemic stroke, intracerebral hemorrhage, and subarachnoid hemorrhage were 1.79, 2.48, and 1.65, respectively, in men and 1.64, 3.15, and 2.29, respectively, in women [4]. Therefore, the risks of high BP for stroke and coronary artery disease in Korea have been well documented. Moreover, the risk of stroke is more clearly attributable to hypertension than that of coronary artery disease.

The awareness, treatment, and control rates are generally improving. According to the data from the KNHANES during the period from 2008 to 2011, the awareness rate was 58.5

Table 1. The trend in the prevalence of hypertension in the population aged >30 years (2011 National Health Statistics)

	1980 ^a	1990 ^a	1998 ^b	2001 ^b	2005 ^b	2007 ^b	2008 ^b	2011 ^b
All			29.9	28.6	28.0	24.6	26.3	28.5
Male	35.5	33.2	32.5	33.2	31.5	26.9	28.1	32.9
Female	26.9	25.4	26.9	25.4	23.9	21.8	23.9	23.7

^aThe prevalence in 1980 and 1990 was based on the nationwide study for the prevalence of hypertension.

^bAge-adjusted for the estimated population in 2005.

and 76.1% among men and women aged >30 years, respectively, which was an improvement relative to the previous data (table 2). The treatment rate in 2001 was 22.2 and 37.5% in men and women, respectively, according to the in-depth report of the KNHANES 2005, which improved to 51.7 and 71.3% in men and women, respectively, in the 2008–2011 period (table 2). The control rate in 2001 was quite low at 9.9 and 18.0% in men and women, respectively. However, as of the 2008–2011 period, it had increased to 36.9 and 49.4% in men and women, respectively (table 2). Although there was no clear change in the prevalence of hypertension, the mean BP has steadily decreased, especially among patients with hypertension.

Office BP-Centered Approach and Subdivision of the Prehypertension Category

Hypertension is defined as an SBP or a diastolic blood pressure (DBP) ≥ 140 or ≥ 90 mm Hg, respectively. Normal BP is defined only as both an SBP <120 mm Hg and a DBP <80 mm Hg. When SBP is ≥ 120 but <140 mm Hg and/or DBP is ≥ 80 but <90 mm Hg, the patient is considered to have prehypertension. The remarkable difference is that prehypertension is further classified as stage 1 and 2 prehypertension. In stage 1 prehypertension, SBP is ≥ 120 but <130 mm Hg and/or DBP is ≥ 80 but <85 mm Hg. In stage 2 prehypertension, SBP is ≥ 130 but <140 mm Hg and/or DBP is ≥ 85 but <90 mm Hg. The reason for this subdivision is that the cardiovascular risk is significantly different within the prehypertensive range. For example, in the KMIC study, the risk of coronary artery disease was 2.51-fold higher in the stage 2 prehypertension group than in the stage 1 prehypertension group [6, 7]. In addition, the probability of progressing to hypertension and the risk for a cardiovascular event were both reported to be higher in the prehypertension group than in the normal BP group [8–10]. In another paper from the KMIC study, a BP >135/85 mm Hg was associated with the occurrence of hemorrhagic stroke in male subjects. Hypertension is further classified as stage 1 and 2 hypertension as shown in table 3.

Table 2. Trends in the management of hypertension (standardized for Census 2005, National Health Statistic)

	1998	2001	2005	2008–2011
Awareness	27.0	36.0	59.8	66.9
Treatment rate	19.1	29.3	47.1	61.1
Control rate for all hypertension patients	7.4	14.9	32.2	42.9
Control rate for treated hypertension patients	22.9	37.0	54.9	69.3

Values are presented as percentages. The criterion for patients with treatment of hypertension was taking antihypertensive drugs on >20 days per month.

Table 3. The classification of BP and hypertension

	Category	SBP, mm Hg		DBP, mm Hg
Normal BP		<120	and	<80
Prehypertension	stage 1	120–129	or	80–84
	stage 2	130–139	or	85–89
Hypertension	stage 1	140–159	or	90–99
	stage 2	160	or	100
Isolated systolic hypertension		140	and	<90

Table 4. Criteria for the definition of hypertension with different methods of measurement

	SBP, mm Hg	DBP, mm Hg
Clinic or office BP	≥140	≥90
Ambulatory BP		
24-hour	≥130	≥80
Day	≥135	≥85
Night	≥120	≥70
Home BP	≥135	≥85

The decision-making in the Korean guideline of hypertension was based on the office BP measured by the auscultation method using a stethoscope. However, the guideline also stressed the importance of home BP measurement and ambulatory BP monitoring to diagnose white-coat hypertension, masked hypertension, and resistant hypertension, to titrate the dosage of antihypertensive drugs, and to improve the patient compliance [11]. Hypertension can be diagnosed when home BP or mean daytime BP is ≥135/85 mm Hg (table 4). When making a diagnosis of hypertension based on home BP measurement, it is recommended to measure at least on 5 consecutive days in a week and to perform 1–3 measurements in each session in the morning and evening. In the morning, BP is measured after voiding, within 1 h of awakening, and before taking antihypertensive drugs. In the evening, it is measured before sleep. When calculating the mean BP, the readings on the first day are usually omitted.

In ‘out-of-office’ BP measurement, white-coat hypertension and masked hypertension need to be considered. The KorABP registry in secondary or tertiary referral centers supported by the Korean Society of Hypertension reported that 14.9% of patients were found to have white-coat hypertension, and masked hypertension was observed in 17.6% of 1,916 subjects who underwent ambulatory BP monitoring for the diagnosis of hypertension [12].

Comprehensive Risk Stratification for Hypertension Care

The risk stratification of hypertension was based on the KMIC data, which were drawn from patients with the following characteristics: (1) registered in the early 1990s; (2) relatively young age range of 35–59 years, and (3) relatively high socioeconomic status [13]. The lowest risk for a cardiovascular event in the KMIC data was 2–3 or 2.5% among the patients in their 40s. According to the guidelines presenting risk group by cardiovascular event rates [14, 15], the average-risk group included those patients with a risk approximately 2-fold higher than that of the lowest-risk group, corresponding to a 10-year cardiovascular event rate of 5%. The moderate added-risk group was defined as the patients with a risk ≥2-fold higher than that of the average-risk group, i.e. a 10-year cardiovascular event rate of ≥10%. The high added-risk group was defined as the group with a risk ≥2-fold higher than that of the moderate added-risk group, i.e. a 10-year cardiovascular event rate of ≥20%. Therefore, the 10-year cardiovascular event rates for the lowest-, average-, low added-, moderate added-, and high added- (including the highest added-) risk groups were 2.5, 5, 5–10, 10–15, and ≥15%, respectively, after consideration of the potential underestimation; these levels correspond to the cardiovascular event rates of 2.5, 5, 5–15, 15–20, and 20% in the European guidelines [14–16]. Patients with stage 1 hypertension who are in their 40s and have no other cardiovascular risk factors have a risk of 4.3–5.3%; some of them may be at above-average risk, whereas the women in this group are at below-average risk, i.e. 4.0–4.9%. The cardiovascular risk was stratified using the BP level, number of risk factors, evidence of subclinical organ damage, and clinical cardiovascular diseases, as shown in table 5.

Table 5. Stratification of global cardiovascular events for hypertensive patients

Risk profile	BP		
	stage 2 prehypertension (130–139/85–89 mm Hg)	stage 1 hypertension (140–159/90–99 mm Hg)	stage 2 hypertension (≥160/100 mm Hg)
Risk factors: 0	Lowest-risk group	Low added-risk group	Moderate to high added-risk group
Risk factors other than DM: 1–2	Low to moderate added-risk group	Moderate added-risk group	High added-risk group
Risk factors: ≥3 or subclinical organ damage	Moderate to high added-risk group	High added-risk group	High added-risk group
DM, cardiovascular diseases, chronic kidney disease	High added-risk group	High added-risk group	High added-risk group

Risk factors: age (men ≥45 years old, women ≥55 years old), smoking, obesity (or abdominal obesity), dyslipidemia, impaired fasting glucose or impaired glucose tolerance, family history of premature cardiovascular disease, and DM. The 10-year cardiovascular event rates for the lowest-, average-, low added-, moderate added-, and high added- (including the highest added-) risk groups were 2.5, 5, 5–10, 10–15, and ≥15%, respectively, according to Korean Medical Insurance Company Study data. DM = Diabetes mellitus.

Table 6. Summary of the target BPs in hypertension treatment

	SBP, mm Hg	DBP, mm Hg
Uncomplicated hypertension	140	90
Elderly	140–150	90
Diabetes mellitus	140	85
Stroke	140	90
Coronary artery disease	140	90
Chronic kidney disease		
Without albuminuria ^a	140	90
With albuminuria	130	80

^a Microalbuminuria or macroalbuminuria.

Principles of Treatment

The Korean guideline does not recommend a drug therapy in patients within the prehypertensive range, even in patients with prediabetes [17, 18], diabetes mellitus [19], stroke [20], or coronary artery disease [21]. In an elderly population over 65 years old, drug therapy can be initiated when the SBP is ≥160 mm Hg.

The target BP is generally an SBP of <140 mm Hg and a DBP of <90 mm Hg (table 6) [22–24]. In the elderly, the target SBP is approximately 140–150 mm Hg with a DBP that is not excessively low, i.e. less than approximately 60 mm Hg [25, 26]. In patients with hypertension and diabetes, the recommended target BP is an SBP <140 mm Hg [27] and a DBP <85 mm Hg [28]. In patients with previous cardiovascular disease including stroke, a reduction of SBP to <130 mm Hg shows no consistent prevention [29–33]. Therefore, a target SBP of <140 mm Hg is recommended. In patients with chronic kidney disease, further control of SBP to <140 mm Hg has shown no additional benefit [34–36]. A meta-analysis has not proven that a target BP of <140 mm Hg is any more effective at preventing cardiac and renal events, either [27, 37, 38]. Therefore, a target SBP of <140 mm Hg is recommended regardless of the presence of diabetes. However, a target SBP <130 mm Hg can be recommended in patients with hypertension with prominent albuminuria [2].

Fig. 1. Recommended combination therapy. Thick lines indicate preferred combination, and thin lines indicate feasible combination. ARB = Angiotensin receptor blocker; ACE = angiotensin-converting enzyme.

In lifestyle modification, sodium reduction is the most important factor in non-drug treatment, because the estimated daily salt intake according to the 2010 KNHANES is 4.9 g of sodium, which is a higher amount than in western or Japanese populations [39].

Key Points in Pharmacologic Treatment

Five classes of antihypertensive drugs, including angiotensin-converting enzyme inhibitors, β -blockers, calcium antagonists, and diuretics, were equally recommended as a first-line treatment. There is no uniform consensus on the role of β -blockers in elderly patients with hypertension, so prescription of β -blockers in the elderly should be limited to special circumstances. β -Blockers should also be used with care in patients at high risk for diabetes, because in combination with diuretics, they can increase the risk of new onset of diabetes [2]. In patients with BP >160/100 mm Hg or more than 20/10 mm Hg above the target BP, two drugs can be prescribed in combination to maximize the antihypertensive effect and achieve rapid BP control [2].

If BP is not controlled with a single drug, two drugs should be combined for BP control. Combination therapy is more effective than single-drug therapy at a higher dose [40]. Combination therapy chosen from the renin-angiotensin system inhibitors, calcium antagonists, and diuretics is recommended first because it has shown relatively good results [23, 41, 42], but β -blockers can also be combined with drugs of other classes (fig. 1). However, the combination of β -blockers and diuretics can increase the incidence of diabetes and metabolic disorders and thus requires periodic monitoring.

Summary and Conclusion

With limited outcome data in Korea, the Guideline Committee of the Korean Society of Hypertension adopted other hypertension guidelines and modified them to our situation through a transparent guideline development process. Therefore, we think this guideline will be particularly useful for Koreans and guide hypertension diagnosis and management for health-care professionals in Korea.

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