

Prevalence, Awareness, and Control of Hypertension among Diabetic Koreans

Hyun Hee Chung, Kyu Chang Won

Division of Endocrinology and Metabolism, Department of Internal Medicine, Yeungnam University College of Medicine, Daegu, Korea

Hypertension affects approximately 70% of patients with diabetes and is approximately twice as common in persons with diabetes as in those without. At the age of 45, around 40% of patients with type 2 diabetes are hypertensive, increasing to 60% by the age of 75 [1]. The overlap between hypertension and diabetes substantially increases the risk of ischemic cerebrovascular disease, retinopathy, and sexual dysfunction. Effective control of blood pressure (BP) has been associated with a reduction in both the microvascular and macrovascular complications of diabetes. Thus, a major challenge for people with diabetes is the management of hypertension. However, reaching a target level (less than 130/80 mm Hg) of BP control has been difficult to achieve. Studies suggest that many diabetic patients do not achieve target BP control. For example, in the Third National Health and Nutrition Examination Survey (NHANES-III), 31% of all diabetic patients and nearly 60% of those with previously diagnosed hypertension had a BP >140/90 mm Hg [2,3]. Among elderly diabetic patients seen in an academic medical center, 85% had a BP \geq 130/85 mm Hg [4,5]. Berlowitz et al. [6,7] reported that diabetic patients with hypertension received less intensive antihypertensive therapy than patients without diabetes. Using a threshold for hypertension control of \leq 140/90 mm Hg, they found that 73% of diabetic hypertensive subjects did not reach this target BP.

Little is known about the prevalence and control of hypertension among patients with diabetes in Korea. Lim et al. [2]

reported that the age-adjusted prevalence of hypertension in the Korean population was 60.4%. However, that study did not include a recent study of prevalence, awareness and control of hypertension among diabetic Koreans. The Hypertension Optimal Treatment (HOT) study and the UK Prospective Diabetes Studies (UKPDS) have shown the benefits of achieving tighter BP control [1,8]. In the HOT study, diabetic patients randomized to a target diastolic BP of 80 mm Hg or less had a 50% reduction in major cardiovascular events compared with those with a target diastolic BP of 90 or less [8]. Moreover, the benefits of tight BP control in patients with diabetes exceed the benefits of tight glycemic control and extend not only to the prevention of macrovascular disease, but also to the prevention of microvascular complications [1]. However, in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) BP study, investigators evaluated the potential benefits of targeting a systolic BP level below 120 mm Hg versus a level below 140 mm Hg in patients with type 2 diabetes (34% of whom had cardiovascular disease) [9]. After 4.7 years, there were no significant between-group differences in the annual rate of the primary outcome, a composite of nonfatal myocardial infarction, nonfatal stroke, or death from cardiovascular causes. Serious adverse events that were attributed to BP medication were more frequent in the intensive-therapy group. As a result of the factorial design of the overall ACCORD study and the inclusion and exclusion criteria that were applied, the

Corresponding author: Kyu Chang Won
Division of Endocrinology and Metabolism, Department of Internal Medicine, Yeungnam University College of Medicine, 317-1 Daemyung-dong, Nam-gu, Daegu 705-717, Korea
E-mail: kcwon@med.yu.ac.kr

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study's statistical power was reduced, and the event rate was lower than expected. Thus, the design and results of the ACCORD BP study leave unresolved the issue of the optimal BP target in patients with diabetes. Therefore, lowering systolic BP from the 135 mm Hg to around 120 mm Hg does not reduce most cardiovascular events or the rate of death, and most of the benefit from lowering BP is achieved by targeting a goal of less than 140 mm Hg. Compliance is an important factor related to optimal BP control. Shea et al. [10] reported that non-compliance with an antihypertensive regimen was strongly associated with severe and uncontrolled hypertension. Also, in this issue, Seo et al.'s [11] study finds a difference between antihypertensive medication compliance and BP control. It is important to realize that there is still much to be learned about the doctor-patient relationship and its effects on hypertension treatment [10]. Affecting the renin-angiotensin-aldosterone system appears particularly useful in diabetic people, certainly for the prevention of poor renal outcomes [12-14]. Calcium channel blockers are recommended in a recent study that suggests favorable outcomes with preservation of the glomerular filtration rate [15]. Thiazide plus cardio-specific beta-blocker combinations are probably undesirable compared with angiotensin-converting enzyme inhibitors plus calcium channel blockers, but combination alpha/beta-blockers may have particularly desirable characteristics and, in many comparisons, BP levels have not been equal on different regimens. Therefore it becomes uncertain whether different medications or different BP goals are what is being compared [16]. Wong et al.'s [17] study also showed that 80% to 83% of diabetic patients with hypertension received drug therapy, but only 12% to 35% of patients controlled their BP below 130/80 mm Hg, depending on various data sources.

In this issue, Seo et al.'s [11] study results are similar to the findings of other studies. They reported that 57.5% of all patients were over the age of sixty. Their mean HbA1c was $7.6 \pm 1.5\%$. Among antihypertensive medication users, 39.9% had a BP of <130 mm Hg and <80 mm Hg and 60.1% had a BP ≥ 130 mm Hg or ≥ 80 mm Hg. The answer "BP is generally felt to be under good control" was given by 75.1% of antihypertensive medication users, and of these patients, 26.4% had a BP of <130 mm Hg and <80 mm Hg and 73.6% had a BP ≥ 130 mm Hg or ≥ 80 mm Hg. A total of 75.5% of antihypertensive medication users answered that they had taken antihypertensive medication every day for the most recent 2 weeks. "Forgetfulness" was the most frequent reason given for noncompliance

for those who did not regularly take antihypertensive medication. Seo et al.'s [11] study is the first epidemiologic study of prevalence, awareness and control of hypertension among diabetic Koreans. However this study had several limitations. It used survey-based data (interviews and medical records review) and a limited survey questionnaire, and therefore no causal relationships could be precisely delineated. Also, information on duration of diabetes and exact age for diabetic patients was not included in this study. In addition, they used subjects from 43 university hospitals in Korea. Therefore, these results cannot be extrapolated to subjects in the general population.

According to Seo et al.'s [11] study, tighter BP control is needed to reduce complications of diabetes in Koreans. Also, we must balance the adverse effects of lowering BP with the benefits of such treatment. Most importantly, we should be aware of the potential for the harmonious interaction of combined glucose and BP lowering.

We appreciate the devotion of study investigators, who are conducting important studies about prevalence, awareness and control of hypertension among diabetic Koreans and hope that expansion on these findings will yield even more useful results in the future.

CONFLICTS OF INTEREST

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

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