Letter

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The Prevalence of Peripheral Arterial Disease in Korean Patients with Type 2 Diabetes Mellitus Attending a University Hospital (*Diabetes Metab J* 2011;35:543-50)

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Peripheral arterial disease (PAD) often refers to atherosclerotic blockages found in the lower extremities and is a spectrum of macrovascular complications found in patients with type 2 diabetes. The same risk factors that contribute to coronary artery disease (CAD) and cerebrovascular disease (CVD) also lead to the development of PAD. These vascular conditions often coexist in patients, increasing the risk for developing ischemic events such as myocardial infarction and stroke. Also, PAD patients without clinical evidence of CAD have the same relative risk of death from cardiac or cerebrovascular causes as those diagnosed with prior CAD, consistent with the systemic nature of the disease [1]. Nearly 50% of all patients with PAD are asymptomatic, and PAD in these patients is often detected by measuring the ankle-brachial index (ABI), which is the ratio of the highest systolic blood pressure (SBP) in the dorsalis pedis or posterior tibial artery of each leg to that of the highest SBP in the brachial artery of the arms. The ABI has 95% sensitivity and 99% specificity for the detection of PAD [2].

In a recent issue of *Diabetes & Metabolism Journal*, Yu et al. [3] presented an article regarding the prevalence of PAD in Korean patients with type 2 diabetes. The authors reported that 3.2% of Korean diabetic patients attending a university hospital were diagnosed as having PAD, and the presence of microvascular and/or macrovascular complications was independently associated with PAD. Their study is one of a few reporting the prevalence of PAD in Korean type 2 diabetic patients and is an interesting paper that addresses the association between PAD and microvascular and/or macrovascular complications.

First, as the authors of that study mentioned, the prevalence of PAD in their study (3.2%; mean age, 67 years; duration of diabetes, 12.9 years), that of PAD in a previous nationwide survey performed by the Committee of the Korean Diabetes Association on the Epidemiology of Diabetes Mellitus (3%; mean age, 59 years; duration of diabetes, 8.8 years) and that of PAD in the Korean National Diabetes Program [4] (1.1%; mean age, 54 years; duration of diabetes, 6.0 years) were considerably lower than those in the United States, Germany, and China (22 to 32%; mean age, 60 to 73 years; duration of diabetes, 6.0 to 7.2 years). The age and duration of diabetes in Korean participants were not younger or shorter than those in Western or Chinese populations. However, the prevalence of PAD in Japan or India (7.6% and 6.3%, respectively) were as low as that in Korea [5,6]. We cannot determine whether this effect is specific to Asians because the prevalence of PAD in China was high.

Second, although an ABI of less than 0.9 is the most commonly used value to denote PAD, it should be recognized that

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individuals with an ABI between 0.90 and 0.99 have higher morbidity and mortality compared with those in people with a normal ABI range [7]. On the other hand, an ABI value greater than 1.3/1.4 or incompressible arteries at ankle level suggest the presence of medial arterial calcification (MAC), which usually affects medium- to small-sized muscular arteries in diabetic patients, especially in the lower limbs, and shows histological calcification in the medial arterial wall, instead of the intimal calcification found in atheromatous arterial disease [8]. This finding renders the diagnosis of PAD by an ABI measurement unreliable. In the Strong Heart Study, cardiovascular mortality over an 8-year follow-up period was significantly higher in subjects with an initial ABI <0.9 or >1.4 compared with that of normal ABI subjects. The U-shaped association between ABI and cardiovascular mortality correlated with the increased prevalence of diabetes and hypertension in both low and high ABI groups [9]. Both high (>1.4 or noncompressible) and low ABIs (<0.9) have been closely associated with chronic kidney disease [10]. The subanalysis of a group with borderline ABI values (0.90 to 0.99) would help to provide insight on the association between PAD and atherosclerotic complications. Also, we wonder why subjects with high ABI (>1.4) accounted for only 0.7% of the study population because several studies have shown that the prevalence of MAC in patients with type 2 diabetes is not small [11,12].

Third, because central pulse wave velocity (PWV) values could not be measured by a VP-1000 device, only baPWV measurements between groups with or without PAD among PWV segments were shown in this study. However, increased aortic PWV is regarded as subclinical target damage. A recent study demonstrated that arterial stiffness values in different regions may have different roles in cardiovascular disease and showed that, among the central PWV and peripheral PWV measurements, elevated aortic PWV was most closely associated with coronary, cerebral, peripheral arterial disease and chronic kidney disease [13,14]. Also, baPWV measurements are known to not be reliable in patients with ABI <0.9.

This study by Yu and colleagues is a clinically important work showing the ethnic differences in the prevalence of PAD in Korea compared those in Western or Chinese populations. Additional large sample and sophisticated, long-term prospective cohort studies directly comparing clinical outcomes, such as symptoms of PAD, foot ulcers, amputation or cardiovascular morbidity or mortality and a survey of medications, are warranted. Finally, we greatly appreciate the devotion of the study investigators to reveal such important clinical data and wish them continued success in their future study.

CONFLICTS OF INTEREST

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

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