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# The Effect of an Angiotensin Receptor Blocker on Arterial Stiffness in Type 2 Diabetes Mellitus Patients with Hypertension (*Diabetes Metab J 2011;35:236-42*)

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We appreciate the interest and comments on our study, "The effect of an angiotensin receptor blocker on arterial stiffness in type 2 diabetes mellitus patients with hypertension," which was published in *Diabetes & Metabolism Journal* 2011;35:236-242.

Hypertension and type 2 diabetes mellitus are major risk factors for cardiovascular disease. In type 2 diabetes, hypertension often initiates and accelerates the progression of macrovascular events by increasing arterial stiffness [1,2]. Increased arterial stiffness was recently reported to be a powerful and independent risk factor for early mortality and had more clinical prognostic value than previously identified cardiovascular disease risk factors such as age, gender, smoking and dyslipidemia [3].

Previous studies have reported that angiotensin II type 1 receptor blockers reduce arterial stiffness [4-6]. In our study we assessed changes in central aortic waveforms and pulse wave velocity (PWV) as well as related parameters after treatment with valsartan in patients with type 2 diabetes and hypertension. We excluded patients concomitantly using insulin, thiazolidinedion or metformin as insulin resistance is associated with arterial stiffness and premature vascular sclerosis [7,8]. Our group of study subjects was homogeneous in terms of diabetes treatment, which had a minimal effect on insulin resistance.

As Dr. Kim noted, our study has some limitations. There was no control group treated with other anti-hypertensive agents and confounding factors, such as lipid-lowering drugs, antiplatelet agents, and smoking, were not considered in the analysis. We were unable to measure PWV in all participants and the potential selection bias and diminished statistical power due to the small number of subjects was another limitation of this study.

Although data was not shown in the article, there was no difference in baseline PWV values between the 'PWV decrease' and 'no PWV decrease' groups (11.0±1.8 vs. 10.5±2.0, $P$=0.297), and baseline PWV values were not associated with fasting blood glucose or HbA1c ($P$=0.462, $P$=0.641). We thought that if the number of subjects were larger, there might be association between them. Because there have been reported that fasting glucose and HbA1c were associated with PWV in type 2 diabetes patients with hypertension [9]. In our results, the baseline glucose level was significantly higher in 'no PWV decrease group.' Therefore, we concluded that the change in PWV was associated with baseline glycemic control status. Also, there were no differences between the two groups in terms of systolic or diastolic blood pressure at 12 weeks ($P$=0.183, $P$=0.396)

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or drug compliance, which was verified at every patient visit. Thus a difference in blood pressure control was excluded as a factor influencing the difference in PWV between the two groups.

The results of our study suggested that the angiotensin receptor blocker, valsartan, had a modest beneficial effect in reducing arterial stiffness measured as PWV and the augmentation index in patients with type 2 diabetes and hypertension. Fasting glucose and HbA1c levels are likely to be independently associated with PWV improvement as a result of valsartan treatment. In future, further trials are needed to validate the effect observed in our study, to examine its stability over longer periods of follow-up, and to compare it with that obtained with other antihypertensive agents commonly used in clinical practice, and evaluate the pathogenic mechanism.

## CONFLICTS OF INTEREST

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

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