

# 論 文 内 容 要 旨

Isolated diastolic hypertension is not associated with  
endothelial dysfunction

(孤立性拡張期高血圧は血管内皮機能異常に関連しない)

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## **Isolated diastolic hypertension is not associated with endothelial dysfunction.**

Historically, the most widely accepted threshold for the definition of hypertension has been blood pressure (BP)  $\geq 140/90$  mmHg. However, in the 2017 American College of Cardiology/American Heart Association (ACC/AHA) hypertension guideline, the threshold was lowered to BP  $\geq 130/80$  mmHg, resulting in a relative increase in the estimated number of individuals with isolated diastolic hypertension (IDH), defined as those with diastolic hypertension but without systolic hypertension. However, it remained unclear whether IDH is independently associated with higher cardiovascular disease (CVD) risk. Endothelial function is the initial step in the pathogenesis of atherosclerosis and plays an important role in the development and progression of atherosclerosis, which can lead to CVD. In addition, endothelial function is an independent predictor for CVD. Hypertension is associated with endothelial dysfunction. However, there is little information on the relationship between IDH and endothelial function. Moreover, it is unclear whether there is a difference between the association of endothelial function with IDH according to the 2017 ACC/AHA definition (systolic BP  $< 130$  mmHg and diastolic BP  $\geq 80$  mmHg) and the association of endothelial function with IDH according to the 2018 European Society of Cardiology/European Society of Hypertension (ESC/ESH) definition (systolic BP  $< 140$  mmHg and diastolic BP  $\geq 90$  mmHg). In the present study, we investigated the association of endothelial function with IDH diagnosed by using two major hypertension guidelines.

We measured the flow-mediated vasodilation (FMD) of the brachial artery as an index of endothelial function in subjects without systolic hypertension who were not treated with antihypertensive drugs. Endothelial dysfunction was defined as FMD less than 7%.

Of 3727 subjects (2813 men; mean age:  $41.3 \pm 10.9$  years), 749 (20.1%) had isolated diastolic hypertension according to the 2017 ACC/AHA definition. There is no significant difference in the FMD value ( $6.9 \pm 3.2\%$  vs.  $7.0 \pm 3.3\%$ ,  $P=0.54$ ) or the prevalence of endothelial dysfunction ( $55.9\%$  vs.  $52.5\%$ ,  $P=0.09$ ) between subjects with IDH and subjects without IDH. Multiple logistic regression analysis revealed that IDH was not associated with endothelial dysfunction (OR, 1.15; 95% CI, 0.98–1.35;  $P=0.09$ ).

Of 4747 subjects (3727 men; mean age:  $45.1 \pm 10.8$  years), 314 subjects (6.6%) had IDH according to the ESC/ESH definition. There was no significant difference in FMD between subjects with IDH and subjects without IDH ( $6.5 \pm 3.1\%$  vs.  $6.9 \pm 3.2\%$ ,  $P=0.09$ ). Although the prevalence of endothelial dysfunction was significantly higher in subjects with IDH than in subjects without IDH ( $60.2\%$  vs.  $54.4\%$ ,  $P=0.04$ ), multiple logistic regression analysis revealed that IDH was not associated with endothelial dysfunction after adjusting for age and sex (OR, 1.04; 95% CI, 0.82–1.32;  $P=0.76$ ). These findings suggest that IDH is not associated with endothelial dysfunction regardless of the major hypertension guideline definition used. From the perspective of endothelial function, emphasis on a healthy lifestyle rather than antihypertensive drug therapy may be sufficient in subjects with IDH.