Letter by Lagro et al Regarding Article, “Average Daily Blood Pressure, Not Office Blood Pressure, Is Associated With Progression of Cerebrovascular Disease and Cognitive Decline in Older People”

To the Editor:

With interest we have read the article by White et al. In their well-designed prospective cohort study, they demonstrate the importance of increased 24-hour systolic blood pressure, but not clinic systolic blood pressure, in the progression of brain white matter hyperintensity volume burden associated with impairment of cognitive function in older people. They conclude that 24-hour of systolic blood pressure may be a potential target for intervention in older people to reduce vascular disease of the brain and impairment of function.

Unfortunately, they did not take blood pressure variability into account, and they did not measure small-vessel disease more precisely with diffusion tensor–imaging measures. Visit-to-visit variability in systolic blood pressure is a strong predictor of stroke, independent of mean systolic blood pressure. Even in patients with treated hypertension, an increased residual variability in systolic blood pressure is associated with a high risk of vascular events. However, stroke has a different pathophysiology compared with small-vessel disease that is reflected in white matter intensity lesions. Moreover, visit-to-visit blood pressure variability does not reflect the same regulatory mechanisms as regular blood pressure measurement with a 24-hour ambulatory blood pressure–monitoring device. Nevertheless, in a small sample of 39 older adults with cardiovascular disease, in whom blood pressure was measured by use of an automated monitor every 10 minutes for 2 hours, systolic blood pressure variability was associated with white matter hyperintensities. Therefore, blood pressure variability, but also blood pressure instability (like orthostatic hypotension), might provide additional information on the association between blood pressure and the presence of small-vessel disease.

Next, small-vessel disease was only measured by conventional magnetic resonance imaging measurement of white matter hyperintensity volume. Diffusion tensor imaging has been shown to be of added value in explaining cognitive function based on brain imaging. This is explained by the fact that small-vessel disease is already causing microstructural damage in the white matter, even on strategic places, which can be measured by diffusion tensor imaging but are still missed by focusing on white matter hyperintensities.

In conclusion, White et al provide convincing evidence for the association between 24-hour systolic blood pressure and white matter hyperintensities. However, when blood pressure variability is added to the usual static systolic blood pressure in their analysis, it might potentially further refine and optimize the target for intervention in older adults to reduce vascular disease of the brain and impairment of function. Therapeutic effects of blood pressure treatment probably are best followed by serial diffusion tension–imaging measurements, because diffusion tension–imaging measures are a better reflection of early changes in small-vessel disease in the brain.

Disclosures

None.

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References

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