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To the Editor:

Using 4.7 years of follow-up data on 2311 Western, hypertensive subjects, Verdecchia and colleagues¹ reported that 24-hour ambulatory mean blood pressure (BP), not pulse pressure (PP), was an independent predictor of stroke risk. Because the association between BP and stroke risk has been reported to be much steeper in Eastern populations than in Western populations,² the prognostic impact of 24-hour mean BP and PP on stroke could be different between these populations. Therefore, we investigated the association between 24-hour mean BP and PP and stroke using data from a general Japanese population.

The design and procedures of this study (the Ohasama study) have been reported previously.^{3,4} We followed 1464 subjects without a history of stroke who underwent 24-hour ambulatory BP monitoring (mean age, 61 years; 40% were women). There were 74 first strokes during a mean of 6.4 years of follow-up. After adjustment for age, sex, and other classic risk factors in a Cox regression model, the risk of stroke increased by 80% (95% confidence interval [CI], 43% to 126%) for every 10 mm Hg increase in 24-hour mean BP, whereas 24-hour PP was not associated with the risk of stroke after controlling for 24-hour mean BP. This association between 24-hour mean BP and stroke was much steeper in participants with hypertension (24-hour BP >134/79 mm Hg⁴; 105% increase in risk for every 10 mm Hg increase; 95% CI, 31% to 222%), indicating a one-third greater increase in stroke risk than in the Western hypertensive population studied by Verdecchia and colleagues¹ (42%; *P* for homogeneity <0.001). These results suggest that ambulatory mean BP, rather than PP, is the major independent predictor of stroke in both Western and Eastern populations, although the impact of 24-hour mean BP on stroke is stronger in Eastern than in Western populations.

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Response

The findings by Ohkubo and coworkers indicate that the steady component of blood pressure (ie, mean blood pressure) is superior to its pulsatile component (ie, pulse pressure) for predicting cerebrovascular events in a general Japanese population at elevated average risk of stroke. The relationship of mean blood pressure to stroke was steeper in their Japanese population than in our Italian population.¹ Overall, these data strongly reinforce the concept that the mean levels of blood pressure, not the fluctuations around the mean, are the main determinants of major cerebrovascular complications, regardless of the ethnicity of the population. However, the progressive fall in diastolic blood pressure with age leads to a progressive underestimation of peripheral vascular resistance by the mean blood pressure equation.² Thus, mean blood pressure and pulse pressure tend to become equally strong predictors of cerebrovascular events in populations with isolated systolic hypertension.³ It would be important to test this hypothesis in Japanese populations.

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