Response to A Recipe for Reducing Blood Pressure Variability: Adding Blood Flow to the Mix

We thank Tzeng et alumps;1 for their interest in our recent findings2 and for sharing their valuable data. The main finding of this study is that the addition of a long-acting dihydropyridine calcium channel blocker (CCB; azelnidipine) to an angiotensin II receptor blocker led to a significantly larger reduction in day-by-day home blood pressure (BP) variability (midterm BPV) than the addition of a thiazide diuretic (hydrochlorothiazide), despite similar reductions in mean home BP in both groups.2

It would be of great interest to examine the impact of BPV on the variability of regional blood flow in vasodilated organs, such as the brain and kidney, during antihypertensive medication. Under the impaired cerebral autoregulation in acute ischemic stroke or stiffening of large arteries, the intracranial pressure and cerebral blood flow might be vulnerable to variations in systemic BP, and it could eventually lead to brain damage. However, the continuous measurement of the dynamic pressure-flow relationship might be difficult in humans. This issue has to be clarified in the future studies.

As Tzeng et alumps;1 suggested, rapid reduction of BP with CCB is not recommended in acute ischemic stroke, because several studies revealed that treatment with nimodipine did not improve neurological and functional outcome but did increase the early case-fatality rate in acute stroke hypertensives. On the other hand, among several classes of antihypertensive drugs, including long-acting dihydropyridine CCBs, are recommended to hypertensives in the chronic phase of cerebrovascular disease in hypertension guidelines, because these drugs were reported to reduce stroke occurrence on the basis of large clinical trials. Although azelnidipine is reported to safely decrease the systemic BP without decreasing cerebral blood flow in hypertensives with cerebral small vessel disease,3,4 the hemodynamic effects of CCB on cerebrovascular systems might be different between the acute phase of ischemic stroke and the chronic phase.

The short-term (or very short-term) BPV should be physiologically differentiated from the day-by-day (or visit-to-visit) BPV.5 The beneficial effects of CCB on day-by-day home BPV reflect that the home BP-lowering effect does not fluctuate from day to day. This may be attributed to the longer duration of action of CCB azelnidipine. In our study,2 the response of day-by-day home BPV to CCB might also depend on an improved efficacy of arterial stiffness and autonomic cardiovascular control mechanisms, specifically of baroreflex function. Further trials are now needed to determine whether antihypertensive drugs that can reduce the day-by-day home BPV effectively will have a beneficial effect on perfusion variability in the brain or kidney and, furthermore, cardiovascular outcome.

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Disclosures

None.

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