Morning Surge in Blood Pressure as a Predictor of Silent and Clinical Cerebrovascular Disease in Elderly Hypertensives

To the Editor:

We read with interest the paper by Kario et al, indicating that an excessive morning surge in blood pressure is a predictor of subsequent stroke in a sample population of elderly Japanese hypertensives.

On one hand, the evident diurnal variation in the onset of many acute cardiovascular events, eg, myocardial infarction, angina, cardiac arrest, sudden death, and pulmonary embolism, is closely related to the circadian pattern of blood pressure. On the other, there is no doubt that hypertension plays a key role as a risk factor for cerebrovascular accidents. However, recent studies from our group found that patients with and without hypertension had the same 24-hour pattern of onset of both ischemic and hemorrhagic stroke, characterized by a morning peak.

Moreover, other cardiovascular events, eg, acute aortic dissection, show an evident diurnal variation as well. Recent data from the large worldwide population of the International Registry of Acute Aortic Dissection found a significant morning peak quite similar in both hypertensive and normotensive subjects.

Taken together, all of these data strengthen the suggestion that the morning surge in blood pressure (irrespective of presence or absence of hypertension) may be crucial in determining the rupture of a critically weakened arterial wall.

We agree that the morning surge in blood pressure should be a therapeutic target for preventing unfavorable cardiovascular events in hypertensive patients, and the medications should provide 24-hour efficacy. However, because a morning surge in blood pressure may also be harmful for normotensive subjects, an accurate evaluation of the range of early morning blood pressure might be useful for normotensive as well.

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Response

We completely agree with Manfredini et al, regarding the possible cardiovascular risk of the morning blood pressure (BP) surge in normotensives as well as hypertensives. Their suggestion could be supported by our results showing that the morning BP surge was associated with stroke risk independent of 24-hour BP levels in hypertensive patients. The impact of the morning BP surge may be enhanced in normotensives with masked hypertension, who are normotensive in the clinic, but have increased BP in daily life. In a recent prospective study on an elderly population, subjects with masked hypertension had the same cardiovascular risk as patients with sustained hypertension.

Even among well-controlled hypertensives, many show increased uncontrolled morning hypertension. Recently, we conducted the Jichi Morning-Hypertension Research (J-MORE) Pilot Study. A total of 1027 consecutive hypertensives who had been under the same antihypertensive medication status for at least for 3 months were recruited from 43 doctors in 32 different clinics in Japan, and the analysis was conducted in 990 samples (mean±SD; age, 66.2±10.3 years) after excluding 37 night-shift workers. For 3 consecutive days, home BP monitoring was conducted 2 times in the morning just before taking antihypertensive medication and in the evening just before going to bed, using automatic devices. Concomitant cardiovascular diseases were as follows: stroke (7.3%), coronary artery disease (11.8%), renal failure (4.9%), hyperlipidemia (40.7%), and diabetes (13.3%); 12.3% of the subjects were smokers. The antihypertensive medication used were as follows: calcium antagonist (34.0% long acting, 7.5% short or intermediate acting), angiotensin-converting inhibitors (14.4% long acting, 0.8% short or intermediate acting), angiotensin-receptor blockers (17.9%), diuretics (6.9%), β-adrenergic blockers (9.8%), α-adrenergic blockers (5.8%), and others (2.9%). In the total treated hypertensives, the prevalence of well-controlled hypertension <140 mm Hg systolic and <90 mm Hg diastolic by clinic measurements was 41.5%. As there is no consensus of home BP levels for the definition of hypertension, we used the cutoff values (135 and 85 mm Hg) for morning BP as proposed by the American Hypertension Society. In the well-controlled hypertensives, approximately one half (60.6%) exhibited high morning BP levels (≥135 mm Hg systolic or ≥85 mm Hg diastolic).

Morning BP should be monitored to diagnose undetected morning hypertension even in hypertensives who appear to be well controlled in the clinic, and management of BP guided by the morning level might achieve additional benefit for the prevention of target organ damage and cardiovascular events.

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