Is the Atherosclerotic Risk of Extreme Dipping in Youth Partly Explained by Exaggerated Morning Surge?

To the Editor:

I have read the article by Viera et al1 demonstrating that disrupted circadian rhythm of blood pressure (BP) in youth was a predictor of coronary calcium levels in younger adults. The study is of great interest because, although an association between normotensive nondippers and advanced target organ damage is expected,2 the risk of extreme dipping was unexpected in younger subjects.

In 1999, we first demonstrated a U curve-shaped association between nocturnal BP dipping and silent cerebrovascular disease (silent cerebral infarcts and advanced deep white matter lesions) detected by brain MRI in elderly hypertensive patients, indicating that both types of circadian BP rhythm disruption (ie, nondipping/rising and extreme dipping) predispose individuals for future cardiovascular disease.2,3 In the prospective Jichi Medical University Ambulatory Blood Pressure Monitoring Study, extreme dipping was associated with an increased risk of clinical stroke events compared with that in dippers.3 Extreme dippers with exaggerated BP dipping during sleep are likely to exhibit an exaggerated BP increase in the morning relative to their lowest BP level during sleep. In our previous studies, extreme dipping also showed a close association with orthostatic hypertension and exaggerated morning BP surge.

Exaggerated morning surge in BP and orthostatic hypertension could be considered an early marker of sympathetic activation and an early marker of prehypertension before an increase in BP levels in youth.4 In fact, in the previous report of the Coronary Artery Risk Development in Young Adults Study, orthostatic hypertension was associated with future hypertension.5 Thus, I speculate that the risk of coronary calcium found in extreme dippers of the Coronary Artery Risk Development in Young Adults Study may be partly explained by the risk of exaggerated morning surge. The extreme dipping, orthostatic hypertension, and exaggerated morning surge are partly associated with each other, and together they increase BP variability and the risk of future hypertension, target organ damage, and cardiovascular disease (Figure).

Disclosures

None.

Kazuomi Kario
Division of Cardiovascular Medicine
Department of Medicine
Jichi Medical University School of Medicine
Shimotsuke, Tochigi, Japan


Figure. Age-related impact of blood pressure (BP) variability from the young to the elderly.
Is the Atherosclerotic Risk of Extreme Dipping in Youth Partly Explained by Exaggerated Morning Surge?
Kazuomi Kario

Hypertension. 2012;60:e19; originally published online July 30, 2012;
doi: 10.1161/HYPERTENSIONAHA.112.199620

The online version of this article, along with updated information and services, is located on the
World Wide Web at:
http://hyper.ahajournals.org/content/60/3/e19

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Hypertension can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Hypertension is online at:
http://hyper.ahajournals.org//subscriptions/