Visit-to-Visit Blood Pressure Variability and Carotid Artery Atherosclerosis: Heart Rate Was Not a Confounder

To the Editor:

We read the interesting recent article by Muntner et al., who found that increased visit-to-visit systolic blood pressure (SBP) variability was a significant predictor for all-cause mortality independently of age, sex, and average SBP. On the other hand, in the Letter to the Editor, Ben-Dov et al. suggested that heart rate (HR) may bear on blood pressure (BP) variability. Bradycardia might be a confounder contributing to apparently increased visit-to-visit BP variability and possibly affecting outcome differences.

Recently we have reported the relationship of visit-to-visit BP variations (based on 12 visits once a month) with intima media thickness and stiffness in common carotid artery among the 201 high-risk elderly (79.9±6.4 years old; women: 75%; antihypertensive medication use: 71%) at cardiovascular disease. Exaggerated visit-to-visit BP fluctuations were significant indicators for carotid artery atherosclerosis and stiffness independent of average BP.

However, impact of average HR on the relationship between visit-to-visit BP variations and carotid artery measures was not analyzed. Interestingly, average HR among 12 visits was significantly correlated with coefficient of variation SBP ($r = -0.254$; $P < 0.001$), whereas that was not significantly correlated with delta SBP ($r = 0.062$; $P = 0.4$; Figure). In the multiple linear regression analysis, delta in SBP ($P < 0.001$) was associated with maximum intima media thickness independent of age, sex, smoking, renin-angiotensin system inhibitor use, low-high density lipoprotein level, average SBP, and average HR. The coefficient of variation ($P < 0.05$) and delta ($P < 0.05$) in SBP were associated with stiffness parameter $\beta$ independent of age, smoking, lower-high density lipoprotein level, average BP, and average HR. Thus, HR might not be a confounder for the relationship between visit-to-visit BP variations and carotid artery atherosclerosis, although decreased HR might serve as an indicator for increased visit-to-visit BP variability.

Disclosures

None.

Michiaki Nagai
Shobara City Soryo Clinic
Hiroshima, Japan

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

Visit-to-Visit Blood Pressure Variability and Carotid Artery Atherosclerosis: Heart Rate Was Not a Confounder
Michiaki Nagai, Satoshi Hoshide and Kazuomi Kario

Hypertension. 2011;58:e16; originally published online August 1, 2011;
doi: 10.1161/HYPERTENSIONAHA.111.176826

Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2011 American Heart Association, Inc. All rights reserved.
Print ISSN: 0194-911X. Online ISSN: 1524-4563

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/58/3/e16

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/