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,1 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 al2 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.3 Exaggerated visit-to-visit BP fluctuations were significant indicators for carotid artery atherosclerosis and stiffness independent of average BP.3

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, lower 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.

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Figure. Scatterplots of delta systolic blood pressure (SBP) and coefficient of variation (CV) SBP with average heart rate (HR). The average HR was positively significantly correlated with CV SBP.
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