Indices of Blood Pressure Variability and Cardiovascular Risk

To the Editor:

I read with interest the article by Hansen et al. evaluating the relation between blood pressure (BP) variability and risk. The prognostic value of BP variability, expressed as SD, was previously evaluated achieving contrasting results. One study reported that cardiovascular mortality was not associated with SD but with residual diastolic BP variability, evaluated by Fourier spectral analysis. The appropriateness of SD as an index of BP variability has been questioned, and it has been proposed a new index, named average real variability (ARV). In a preliminary study, it has been shown that high ARV of daytime systolic BP, but not high SD, was associated with increased risk.

In untreated and treated hypertensive patients, we found higher cardiovascular risk in those with high ARV (>_8.7 to 8.9 mm Hg) of daytime systolic BP; hazard ratio (HR) was 2.07 (1.31 to 3.28) between patients with high and low ARV. High ARV (>_6.6 to 6.5 mm Hg) of daytime diastolic BP tended to be associated with increased risk; HR was 1.36 (0.92 to 2.02) between subjects with high and low ARV. When ARVs of daytime systolic or diastolic BP were considered as continuous variables, HRs per 1-SD increase in the parameter were 1.27 (1.06 to 1.51) and 1.09 (0.91 to 1.29), respectively. Other indices of BP variability did not predict outcome. Daytime and nighttime average BPs were independent predictors of risk.

The study by Hansen et al. reported that higher ARV of 24-hour systolic and diastolic BPs significantly predicted cardiovascular mortality, combined fatal and nonfatal events, and stroke (per 1 SD increase in the variable, HRs were 1.17 and 1.21, 1.07 and 1.07, and 1.10 and 1.14, respectively). SD of systolic BP did not predict events. SD of diastolic BP (corrected for daytime and nighttime duration) predicted cardiovascular mortality and combined fatal and nonfatal events (per 1 SD increase in the parameter, HRs were 1.18 and 1.07, respectively). When 24-hour systolic BP and ARV or 24-hour diastolic BP and ARV were added to the basic model, both average BP and ARV significantly increased risk prediction, but the contribute of ARV was lower (>_9% and 15% of that of 24-hour systolic and diastolic BPs, respectively). The same analysis was not performed by using average BP and SD, and we can speculate that SD did not give any contribution. The authors concluded that, while accounting for other covariates and 24-hour BP (the BP parameter most strongly associated with risk), BP variability was an independent predictor of outcomes, but its contribution to risk was low. In the core of the discussion, the authors stated that, for most outcomes, ARV was a better predictor than SD and that ARV might be a more specific measure of BP variability than SD. However, this aspect did not emerge from the abstract and perspectives. Globally, the data by Hansen et al. and previous ones suggest that, when compared with SD, ARV seems to be a more appropriate index of BP variability and a better predictor of risk.

Disclosures

None.

Sante D. Pierdomenico
Dipartimento di Medicina e Scienze dell’Invecchiamento Università “Gabriele d’Annunzio” and Centro di Ricerca Clinica Fondazione Università “Gabriele d’Annunzio” Chieti, Italy

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Sante D. Pierdomenico

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