Maximum or Mean: That Is the Question

To the Editor:

Recently, Matsui et al. suggested that maximum home systolic blood pressure (SBP) might enhance the predictive value of mean SBP in relation to hypertensive target organ damage in the heart and arteries. However, the data presented do not wholly substantiate the conclusions of Matsui et al. First, because of the collinearity problem between maximum and mean SBP, the results for the total population in Table 3 of their study should have been omitted. Second, the reader is also left without any information on the contribution of maximum SBP in explaining the variance in left ventricular mass index and carotid intima-media thickness, because in their Table 3 only the whole-model R² was given. Third, because of the cross-sectional design and the use of intermediate signs of target organ damage, we suggest that the term “prediction,” as used, for instance, in the conclusion of their Abstract, is inappropriate. Finally, the maximum morning SBP was recorded during the first 3 days in more than one third of the patients studied by Matsui et al. We find it counterintuitive that a measurement obtained within 3 days of self-measurement at home would be more closely associated with target organ damage than the mean level of blood pressure recorded over 14 days.

In trying to replicate the observations of Matsui et al., we evaluated whether, in 2354 Ohasama participants followed up for 12.1 years (median), maximum home SBP (single measurement in the morning for <28 days) predicted cardiovascular mortality (144 deaths). In multivariable-adjusted Cox regression, the standardized hazard ratios associated with the maximum and mean home SBP at home were 1.30 (95% CI: 1.08 to 1.57; P = 0.006) and 1.28 (95% CI: 1.08 to 1.53; P = 0.006), respectively. The correlation coefficient between maximum and mean SBP was 0.91 (P < 0.001). Adding maximum home SBP, therefore, did not improve a Cox model that included mean SBP, as indicated by the likelihood ratio test (likelihood ratio: 0.48; P = 0.48) and vice versa (likelihood ratio: 0.46; P = 0.50). In conclusion, we do not believe that the results from Matsui et al. overrule the current recommendations to measure the home blood pressure over ≥7 days and to use the mean level for risk stratification.

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Disclosures

None.

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