Reviewer’s report

Title: Association between different measurements of blood pressure variability by ambulatory blood pressure monitoring (ABPM) and ankle-brachial index

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Reviewer: Kouichi Tamura

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This study by Wittke et al. compared three different parameters of BP variability obtained by ABPM with respect to possible relationships with ABI values in hypertensive patients. They found that the 24-h time rate index was strongly associated with ABI but neither 24-h SD nor 24-h CV was associated with ABI, thereby suggesting that the time rate index is a sensitive parameter to estimate BP variability by ABPM. The following points should be addressed.

Major points:

1. Because previous studies reported that the magnitude of the nocturnal decline in BP, which is an index of circadian BP variation, was the strongest predictor of the SD of 24-h BP, indicating that the SD of 24-h BP is not an appropriate index of BP variability (Imai Y, et al. Am J Hypertens. 1997:10: 1281–1289; Ref. 12), it is not so surprising that 24-h SD or 24-h CV was not associated with ABI in this study. In order to estimate BP variability using SD or CV, the authors should examine possible relationships between ABI and daytime SD or CV and between ABI and nighttime SD or CV, separately as performed previously (Ref. 8; Sander D, et al. Circulation 2000:102:1536–1541; Shintani Y, et al. J Hypertens 2007:25:1704–1710; Mitsuhashi H, et al. Atherosclerosis 2009:207:186-190).

2. Discussion, page 12, lines 13-22. Although the authors described that the time rate index is more powerful parameters than other parameters such as SD or CV (Refs. 11-13), the formula for BP variability (ARV, average real variability) described in Ref. 13 is likely to be the same with the formula described in this study as the time rate index. This paragraph is rather confusing and the authors should re-write this paragraph and clearly explain the similarities and/or differences between the time rate index and ARV for the readers to better understand exactly the obtainable parameters by ABPM.

3. While a previous study showed that high ARV of daytime systolic BP resulted in an independent predictor of cardiovascular risk in hypertensive patients (Pierdomenico SD, et al. Am J hypertens 2009:22:842-847), a recent large population cohort study failed to show that ARV contributes much to risk stratification over and beyond 24-h BP. (Hansen TW, et al. Hypertension. 2010:55:1049-1057). The authors should discuss the results of theses recent studies.
**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

'I declare that I have no competing interests'