

Publication

Accuracy of 24-hour ambulatory blood pressure monitoring by a novel cuffless device in clinical practice

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Recently, a cuffless blood pressure (BP) measurement device using pulse transit time (PTT) for beat-to-beat calculation of BP values has been validated over a short time period. However, it remains unknown how values obtained with this device compare with standard ambulatory measurements over a 24-hour period. We hypothesised that BP values measured by a cuffless PTT device (TestBP) are comparable with measurements by a standard upper arm cuff-based BP device (RefBP) in clinical practice over 24 hours.; Between May and December 2017, 71 individuals were prospectively included. Cuffless using the Somnotouch-NIBP (Somnomedics GmbH, Randersacker, Germany) and cuff-based standard 24-hour BP measurements were performed simultaneously on the left and right arm, respectively. The first RefBP measurement was used as calibration measurement for the TestBP.; Mean ($\pm$ SD) age was 49.3 (15.1) years, and 51% were male. Mean 24-hour BP for TestBP and RefBP were 140.8 (20.0) versus 134.0 (17.3) mm Hg for systolic ($p < 0.0001$) and 85.8 (14.1) versus 79.3 (11.7) mm Hg for diastolic ($p < 0.0001$) measurements, respectively. Mean absolute systolic and diastolic disagreements between TestBP and RefBP were 10.2 (7.2) and 8.2 (5.5) mm Hg, respectively. The number (percentage) of absolute differences between the mean 24-hour BP values of the TestBP and RefBP within 5, 10 and 15 mm Hg were 23 (32.4), 43 (60.6) and 54 (74.6) for systolic and 24 (33.8), 51 (71.8) and 65 (91.6) for diastolic measurements, respectively.; In clinical practice over 24 hours, there was a significant difference between the TestBP and RefBP with higher systolic and diastolic BP measured with the cuffless PTT device. Reasons for this difference need to be investigated.; NCT03054688; Results.

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