

## Predictive value of 24-hour ambulatory blood pressure monitoring for cardiovascular events

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**Background:** Hypertension is one of the most important cardiovascular risk factors. Twenty-four-hour ambulatory blood pressure (BP) monitoring remains the gold standard to diagnose hypertension. However, it is still unclear whether different time periods of measurement differ in their predictive value for cardiovascular events.

**Purpose:** To investigate whether different time periods of home BP monitoring can be used as a predictor of cardiovascular events and mortality.

**Methods:** In this retrospective study, we included patients who had a 24-hour BP measurement between May 2015 and March 2016. Follow-up data were collected up to a maximum of 67 months. BP measurements were taken every 15 minutes from 9 AM until 9 PM and subdivided into 4 time periods, each consisting of 3 hours of measurements. Correlation of BP with major adverse cardiovascular event (MACE) defined as cardiovascular hospitalization and all-cause mortality was examined using a Cox-regression model, which was adjusted for possible confounding factors.

**Results:** A total of 301 patients were included for analysis with mean follow-up of 1830,4 days  $\pm$  229. The mean age was 64.3  $\pm$  15.2 and 52.8% of patients were female. Mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) for the 4 time periods were respectively 135,3  $\pm$  16/ 82,6  $\pm$  13,2mmHg, 132,3  $\pm$  15,5/ 79,7  $\pm$  12,7mmHg, 135,3  $\pm$  15,5/ 81,7  $\pm$  12,3mmHg and 136,4  $\pm$  16,4 mmHg/ 81,6  $\pm$  12,1mmHg. MACE occurred in 66 (21.9%) patients. The multivariable Cox proportional hazard risk model revealed that SBP between 12 and 3PM (HR 0.966 95% CI (0.945-0.989)) and the DBP between 6 and 9PM (HR 0.935 95% CI (0.898-0.973)) were associated with a reduced risk for MACE. Furthermore, the SBP between 6 and 9PM (HR 1.044 95% CI (1.021-1.068)) and the DBP between 3 and 6PM (HR 1.05 95% CI (1.013-1.089)) were associated with an increased risk for MACE.

**Conclusions:** The risk of cardiovascular events is higher in patients with a high SBP between 6 and 9PM and high DBP between 3 and 6PM. Lower risk is seen when the SBP is high between 12 and 3PM and the DBP is high between 6 and 9PM. These results might be explained by the circadian rhythm of BP. Further study is needed to confirm this time dependent predictive value of BP measurements.