

Is the morning blood pressure surge a mirror image of the nocturnal dip?

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Abstract

Objective: To examine different definitions of the morning blood pressure surge (MBPS), as measured by 24-hour ambulatory blood pressure monitoring (ABPM), and their association with all-cause mortality. Though MBPS is accepted to increase risk; it is not clear how it should be defined. Also, it is difficult to understand why dipping is protective but MBPS predicts adverse outcome.

Methods: We investigated a cohort of 2,627 patients referred for ABPM with available values for at least one hour after awakening, and related them to all-cause mortality.

Results: During 22,353 person-years of follow-up, 246 patients died. We used Cox proportional hazards models to explore mortality associated with different definitions of the MBPS. Only the “one-hour” MBPS (difference between average BP an hour before and after awakening) was related to mortality: after multiple adjustments including 24-hour systolic BP, those whose “one-hour” MBPS was above median ($> 12\text{mmHg}$) had mortality hazard ratio (HR) of 0.61, 95% confidence intervals (CI): 0.47 to 0.79, $P < 0.001$. In predetermined subgroup analyses, non-dippers ($n=1039$), had a highly

significant MBPS-related decrease in mortality: HR 0.49 95% CI: 0.34 to 0.73, $P < 0.001$, unlike dippers ($n=1588$), HR=0.90 95% CI: 0.60 to 1.34.

Conclusion: among subjects referred for ABPM the MBPS seems to mirror the nocturnal dip as a protective mortality factor.

Keywords : ambulatory blood pressure monitoring, dipping, morning surge, mortality, hypertension