6.46 (95% CI, 5.75 to 7.27), with a stroke incidence of 2.92 (95% CI, 2.46 to 3.48). In addition, the incidence of cardiac events was 3.85 (95% CI, 3.30 to 4.48), including a myocardial infarction incidence of 1.03 (95% CI, 0.77 to 1.38). The incidence for sudden death was 0.80 (95% CI, 0.58 to 1.12).

Dr. Kario concluded that data from the HONEST study suggest that on-treatment morning home SBP >145 mm Hg is associated with an increase in risk of cardiovascular events at 2 years. In addition, the risk is high for patients who have masked hypertension (ie, those patients who have high home BP but low clinic BP).

Nighttime SBP Linked to CVEs

Written by Emma Hitt Nichols, PhD

Nighttime systolic blood pressure (SBP) predicts future cardiovascular events (CVEs) independent of other SBP measures, whereas ambulatory daytime SBP and clinic SBP do not, on the basis of a meta-analysis of 9 international cohorts presented by George C. Roush, MD, St. Vincent's Medical Center, Bridgeport, Connecticut, USA.

Current data are unclear as to which type of SBP—daytime ambulatory, nighttime, or clinic—is most predictive of CVEs. Potential limitations of these studies include inadequate sample size, imprecise classification of daytime versus nighttime SBP, and failure to adjust for all 3 types of SBP. The present study addressed these problems.

This systematic review of PubMed and OVID citations included 9 cohorts with a combined sample size of 13,844 patients diagnosed with hypertension, with ≥1 year of follow-up, and with CVEs as outcomes. Meta-analyses provided hazard ratios (HRs) adjusted for sex, age, smoking status, diabetes mellitus, and baseline BP treatment. Dispersion was measured as the coefficient of variation (standard deviation/mean).

Greater dispersion in nighttime SBP was observed in all 9 cohorts compared with daytime SBP (p=0.004). In addition, although clinic, daytime, and nighttime SBP each predicted CVEs when considered individually, after simultaneous adjustment for all 3 SBP measures, only nighttime SBP retained its ability to predict risk (HR, 1.27; 95% CI, 1.20 to 1.34), whereas daytime (HR, 1.01; 95% CI, 0.91 to 1.11) and clinic (HR, 1.00; 95% CI, 0.97 to 1.04) SBP did not (Table 1). Patterns were similar for the 6 cohorts of the highest quality and when considering coronary artery disease and stroke as outcomes.

Although this was a cohort-level analysis rather than an individual-level analysis, it was nonetheless unbiased. The strengths of this study included a large sample size, the ability to evaluate relationships in different populations, the inclusion of high-quality cohorts, and patient-specific night-day classification of SBP.

Why is the greater dispersion for nighttime SBP important? To answer this, consider that modest variations within the "normal" range in blood pressure can result in substantial increments in cardiovascular risk [Vasan RS et al. *N Engl J Med* 2001]. Dr. Roush suggested that nighttime SBP may be critical for several reasons, including the possibility that the decreased arteriolar tone at night might leave target organs such as the heart and brain vulnerable to elevated pressures in large and medium-sized arteries.

In conclusion, this meta-analysis demonstrated that nighttime SBP has greater dispersion than the 2 other types of SBP measurements and that, after simultaneous adjustment for all 3 SBP measures, nighttime SBP retains its ability to predict risk, whereas clinic and daytime ambulatory SBP lose this ability entirely.

Table 1. Prognostication of Nighttime, Daytime, and Clinic Systolic Blood Pressure[a]

	No Simultaneous Adjustment	Simultaneous Adjustment	Simultaneous Adjustment (6 Highest Quality Cohorts)
Type of SBP Measure		**HR for CVEs (95% CI)**	
Night	1.25 (1.22–1.29)	1.26 (1.20–1.31)	1.27 (1.20–1.34)
Day	1.20 (1.15–1.26)	1.01 (0.94–1.08)	1.01 (0.91–1.11)
Clinic	1.11 (1.06–1.16)	1.00 (0.95–1.05)	1.00 (0.97–1.04)

CVEs= cardiovascular events; SBP=systolic blood pressure.

[a]HR values based on a 10 mm Hg increase in nighttime, daytime, and clinic SBP.