Disordered Breathing Takes Toll on Nighttime BP

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People who have sleep-disordered breathing are less likely to experience a normal nighttime decrease in systolic blood pressure, and they are at increased risk of adverse cardiac and other outcomes, according to the results of a new prospective study.

Most people experience a 10%-20% dip in their blood pressure at nighttime (Hypertension 1995;26:60-9). Previously, researchers showed an association between sleep apnea syndrome and a failure to experience that beneficial nighttime decrease in blood pressure, but evidence so far is limited to cross-sectional studies (Am. J. Hypertens. 2001;14:887-92; Chest 2002;122:1148-55).

The new study's findings are important because "nocturnal nondipping" associated with sleep-disordered breathing (SDB) has been linked to target organ damage and to a poor cardiovascular prognosis (Can. J. Cardiol. 2007;23:132-8; JAMA 1999;282:539-46).

Dr. Khin Mae Hla and her associates assessed 328 adults in the ongoing Wisconsin Sleep Cohort Study. All of the participants had a baseline polysomnography study and at least two 24-hour ambulatory blood pressure monitoring assessments during an average of 7.2 years of follow-up. Dr. Hla and her colleagues of the departments of medicine and population health sciences at the University of Wisconsin, Madison, reported their findings in Sleep (2008;31:795-800).

A total of 18% of participants developed systolic nondipping, and 11% developed diastolic nondipping. Although the researchers did not find an association between SDB and diastolic nondipping, the longitudinal association with systolic BP alterations was significant.

"This failure to experience normal dipping adds to the amassing evidence that sleep-disordered breathing has a causal role in cardiovascular disease, possibly via multiple pathways [JAMA 2003;290:1906-14; J. Clin. Sleep Med. 2007;3:409-15]," the researchers wrote.

The chances of developing systolic nondipping were significantly correlated with baseline severity of SDB in a dose-response fashion.

Patients who scored less than 5 on the Apnea-Hypopnea Index (no or minimal SDB) were used as a reference group. In comparison, those with mild SDB (score from 5 to 15) were three times as likely to develop systolic nondipping (adjusted odds ratio, 3.1). In addition, patients with moderate to severe SDB (score of 15 or greater) were more than four times as likely to develop systolic nondipping (OR, 4.4).

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Mean patient age was 49 years, 63% were men, and the mean body mass index was 29 kg/m^2. Dr. Hla and her associates controlled for possible confounders, including age, gender, body mass index, smoking, and alcohol use. Use of continuous positive airway pressure (CPAP) by 11 patients, antihypertensive medication use by 42 patients, and inclusion of 8 patients with a history of cardiovascular disease did not significantly alter the findings.

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Patients using CPAP were included because researchers were unable to determine whether treatment was optimal. That was a possible limitation of the study, the researchers noted, as was a failure to follow all participants who had a baseline 24-hour blood pressure study.

"Our findings of a strong longitudinal association of SDB with nocturnal systolic nondipping of BP have clinical and public health relevance, since SDB and hypertension both are very prevalent in the general population," the authors wrote.

"The development of systolic BP nondipping, a well-established cardiovascular disease risk, in those with mild to moderate SDB underscores the importance of diagnosing SDB even in its milder forms," they said. ■

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