



UPDATE

DOES OBSTRUCTIVE SLEEP APNEA (OSA) REALLY CAUSE HYPERTENSION?

A connection between OSA and HTN has remained inconclusive, largely because the available studies had design flaws that precluded any conclusions that OSA causes HTN (e.g. small number of studies, cross sectional, or inadequate controls for confounding causes of HTN). However, two recent reports provide stronger evidence that OSA is indeed causative.

1. In the Sleep Heart Health Study [1], a cross-sectional community-based multicenter study of adults > 40 years of age, 6,132 participants had all-night sleep studies. The odds ratio for HTN (defined as resting BP > 140/90 mm Hg or use of anti-hypertensives) comparing the highest category of OSA [apnea/hypoapnea index (AHI) > 6/hour] with the lowest (AHI < 1.5/hour) was 1.37 after adjusting for demographic and anthropomorphic variables (including BMI, neck circumference and waist to hip ratio, as well as use of alcohol and tobacco) (P = .005).

2. The Wisconsin Sleep Cohort Study[2] is a prospective, population-based longitudinal study in which 709 subjects (mean age 46 years) completed overnight sleep studies at 4-year intervals. Four years after a baseline assessment, the odds ratios for HTN according to the AHI at baseline were adjusted for baseline HTN status, BMI, neck and waist circumference, age, sex and use of alcohol and tobacco. The findings revealed a dose-response relationship between OSA at baseline and presence of HTN 4 years later. Relative to an AHI of 0 at baseline, the odds ratios for HTN at follow-up were 1.42 for an AHI of 0.1-4.9/hour at baseline, 2.03 for an AHI of 5.0-14.9/hour, and 2.89 for an AHI of > 15/hour. The study revealed no evidence for a threshold below which HTN was not related to OSA.

Animal studies suggest that, in OSA, HTN results from the repetitive episodes of hypoxemia which stimulate arterial chemo-receptors, which in turn excite central sympathetic outflow.

For any patient with HTN, OSA needs to be considered as a possible contributing factor.

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[1] Nieto, F.J. et al. Association of sleep disordered breathing, sleep apnea and hypertension in a large community-based study. JAMA 2000; 283: 1829.

[2] Preppard, P.E. et al. Prospective study of the association between sleep-disordered breathing and hypertension. New England Journal of Medicine 2000; 342: 1378.