



ONLINE
EXCLUSIVE

Q/ Does treating obstructive sleep apnea improve control of Tx-resistant hypertension?

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EVIDENCE-BASED ANSWER

A | **MAYBE.** Treating obstructive sleep apnea (OSA) with continuous positive airway pressure (CPAP) is associated with decreases in both systolic and diastolic blood pressure (BP) of 3 to 5 mm Hg in patients with treatment-resistant hypertension. The clinical significance of this small decrease hasn't been evaluated, however (strength of recommendation [SOR]: C, meta-analyses of randomized controlled trials [RCTs] with disease-oriented outcomes).

Evidence summary

A 2015 meta-analysis by Liu et al of 5 RCTs from 2010 to 2015 (446 patients, range 35 to 194 per trial) evaluated the effect of CPAP on 24-hour ambulatory BP in adults with OSA and moderate to severe resistant hypertension.¹ Resistance was defined as hypertension despite optimally dosed 3-drug regimens or adequate control of BP achieved with a 4-drug regimen.

Treatment groups received at least 4 hours of CPAP nightly in addition to previously prescribed pharmacotherapy; control groups received either sham CPAP or no CPAP in addition to their regimen of antihypertensive medications. Reported drug regimens included primarily diuretics, angiotensin converting enzyme inhibitors, calcium channel blockers, and aldosterone receptor blockers.

Prestudy systolic BP ranged from 129 mm Hg to 148 mm Hg; diastolic BP ranged from 75 mm Hg to 88 mm Hg. Participants were followed from 2 to 6 months. Pooled data from all 5 studies indicated an overall

decrease in mean 24-hour ambulatory systolic BP of 4.8 mm Hg (95% confidence interval [CI], -8.0 to -1.6) and an overall decrease in diastolic BP of 3 mm Hg (95% CI, -5.4 to -0.5) in CPAP-treated patients compared with controls.

An earlier meta-analysis also shows BP reductions with CPAP

Another 2015 meta-analysis by Hu et al of 7 RCTs from 2006 to 2014 evaluated the effect of CPAP on hypertension in 794 patients with OSA.² Subgroup analysis of 4 of these studies (351 patients, range 35 to 194 per trial) evaluated outcomes in patients with a previous diagnosis of resistant hypertension. This subgroup had 3 trials in common with the Liu et al meta-analysis and one not included in that study. Two other studies in the Liu et al meta-analysis were published after the search dates of this meta-analysis.

Baseline BP wasn't reported, and treatment resistance was not explicitly defined. Treatment groups received CPAP for 3 to 6 months in addition to their pharmacotherapy regimen, but duration of nightly use was not reported; control groups received only pharmacotherapy. The number and type of antihypertensive medications used was not reported.

Pooled data from the subgroup noted a significant difference in 24-hour mean ambulatory BPs in the CPAP group compared with controls. Systolic BP decreased by 3.9 mm Hg (95% CI, -6.6 to -1.2) and diastolic BP decreased by 3.7 mm Hg (95% CI, -5.2 to -2.1).

JFP

References

1. Liu L, Cao Q, Guo Z, et al. Continuous positive airway pressure in patients with obstructive sleep apnea and resistant hypertension: a meta-analysis of randomized controlled trials. *J Clin Hypertens (Greenwich)*. 2016;18:153-158. (Epub 2015 Aug 17).
2. Hu X, Fan J, Chen S, et al. The role of continuous positive airway pressure in blood pressure control with obstructive sleep apnea and hypertension: a meta-analysis of randomized controlled trials. *J Clin Hypertens (Greenwich)*. 2015;17:215-222.