Q: Should I suspect obstructive sleep apnea if a patient has hard-to-control hypertension?

A: Yes. Obstructive sleep apnea is common and is associated with hypertension and resistant hypertension. Physicians taking care of patients who have hard-to-control hypertension should be aware of the possible diagnosis of obstructive sleep apnea and screen them for it. In-laboratory polysomnography or home sleep testing should be offered if appropriate, and if obstructive sleep apnea is detected, it should be treated, as this treatment may help to control blood pressure more effectively.

Obstructive sleep apnea is characterized by recurrent episodes of partial or complete collapse of the upper airway during sleep, with partial collapse leading to hypopnea and complete collapse leading to apnea. These episodes result in intermittent hypoxemia, microarousals, sleep fragmentation, daytime sleepiness, and impairment in quality of life.

In tandem with the increasing obesity epidemic, the prevalence of moderate to severe obstructive sleep apnea is 17% in men and 9% in women 50 to 70 years old. Obstructive sleep apnea is particularly common in those with drug-resistant hypertension, which is defined as a suboptimal control of blood pressure despite the use of multiple antihypertensive medications of different classes, a condition associated with significant rates of cardiovascular morbidity and mortality. Even in patients at high risk of cardiovascular disease, we found that those with severe obstruction of the upper airway during sleep had fourfold higher odds of having resistant elevated blood pressure.

The seventh Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure recognized obstructive sleep apnea as one of the causes of secondary hypertension. The 2013 European Society of Hypertension/European Society of Cardiology guidelines suggested an evaluation of obstructive sleep apnea symptoms for the management of hypertension.

Obstructive sleep apnea is also associated with nocturnal nondipping of blood pressure (defined as failure of blood pressure to decline by at least 10% during sleep), which is an independent marker for worse cardiovascular outcomes and hypertension-induced target organ damage.

Moreover, the more severe the obstructive sleep apnea, the greater the risk of incident hypertension. And large, long-term observational studies have shown higher incidence rates of hypertension in people with untreated obstructive sleep apnea than in those who underwent treatment for it with continuous positive airway pressure (CPAP).

Obstructive sleep apnea is also associated with nocturnal nondipping of blood pressure (defined as failure of blood pressure to decline by at least 10% during sleep), which is an independent marker for worse cardiovascular outcomes and hypertension-induced target organ damage.

Obstructive sleep apnea is particularly common in those with drug-resistant hypertension, which is defined as a suboptimal control of blood pressure despite the use of multiple antihypertensive medications of different classes, a condition associated with significant rates of cardiovascular morbidity and mortality. Even in patients at high risk of cardiovascular disease, we found that those with severe obstruction of the upper airway during sleep had fourfold higher odds of having resistant elevated blood pressure.

Pathophysiologic mechanisms that may explain the association between obstructive sleep apnea and hypertension include stimulation of the sympathetic nervous system, increased aldosterone levels, and increased renin levels.
OBSTRUCTIVE SLEEP APNEA

TABLE 1
Signs and symptoms of obstructive sleep apnea

Daytime sleepiness
Restlessness during the night
Night sweats
Nocturia
Dry mouth

Physical examination findings
Narrow airway
Obesity
Deviated nasal septum
Enlarged tonsils
Macroglossia
Dental overbite
Retrognathia
Narrow maxilla or mandible
High arched palate

- Pressure: Do you have or are you being treated for high blood pressure?
- Body mass index: Is your body mass index greater than 35 kg/m²?
- Age: older than 50?
- Neck circumference: greater than 40 cm?
- Gender: Male?

A score of 3 or more indicates a high risk of obstructive sleep apnea, and further workup for it is appropriate. Some of the other symptoms and signs are listed in Table 1.

SLEEP STUDIES:
IN THE LABORATORY OR AT HOME

In-laboratory polysomnography entails electro-oculography, electromyography, electroencephalography, electrocardiography, pulse oximetry, and measurement of oronasal flow and thoracoabdominal movement (using sensors and belts). It should be performed in patients who have significant comorbid conditions.

A home sleep study, which is more limited than polysomnography, is appropriate in those who have a high probability of obstructive sleep apnea and who do not have other sleep disorders or significant cardiovascular, neurologic, or respiratory disorders.

Subsequently, if obstructive sleep apnea is found, a positive airway pressure titration study is performed to determine the optimal pressure requirements.

CPAP IS THE GOLD STANDARD TREATMENT

Behavioral changes are recommended to correct factors that predispose to obstructive sleep apnea or aggravate it. These changes include avoiding alcohol, sleeping on one’s side rather than supine, weight reduction in overweight individuals, and treating nasal congestion. In some situations, oral appliances or surgical options can be considered. However, CPAP is the gold standard therapy and the one most commonly used.

CPAP LOWERS BLOOD PRESSURE

Effective treatment of obstructive sleep apnea, added to an antihypertensive regimen, can further lower the blood pressure more than the antihypertensive medication regimen by itself.
Several meta-analyses have shown modest improvements in blood pressure with CPAP in hypertensive patients. CPAP’s effect on blood pressure seems to be more pronounced in those with resistant hypertension, in whom a meta-analysis of randomized controlled trials demonstrated a mean reduction in systolic blood pressure of 6.74 mm Hg and a mean reduction in diastolic blood pressure of 5.94 mm Hg.12 A recent clinic-based (“real-world”) study revealed lowering of blood pressure in patients with resistant and nonresistant hypertension—approximately 2 to 3 mm Hg after CPAP therapy.13

Furthermore, a randomized controlled trial in Spain showed that the nocturnal nondipping pattern observed in patients with resistant hypertension was reversed with the use of CPAP.14

LET US HEAR FROM YOU

Let us hear your opinions about the Cleveland Clinic Journal of Medicine.
Do you like current articles and sections?
What topics would you like to see covered and how can we make the Journal more useful to you?

PHONE 216.444.2661
FAX 216.444.9385
E-MAIL ccjm@ccf.org
WWW http://www.ccjm.org

CLEVELAND CLINIC JOURNAL OF MEDICINE
Cleveland Clinic
1950 Richmond Rd., TR404
Lyndhurst, Ohio 44124

REFERENCES

ADDRESS: Harneet K. Walia, MD, Center for Sleep Disorders, Neurological Institute, FA20, Cleveland Clinic, 9500 Euclid Avenue, Cleveland, OH; waliah@ccf.org