FPIN's Clinical Inquiries

Clinical Indicators of Obstructive Sleep Apnea

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Clinical Question

Which clinical signs and symptoms are predictive of obstructive sleep apnea (OSA)?

Evidence-Based Answer

Clinical indicators (e.g., sex, snoring severity, history of apnea, age, menopausal status, waist-to-hip ratio, body habitus) can predict OSA as diagnosed using overnight polysomnography or sleep study. (Strength of Recommendation: B, based on multiple cross-sectional studies.) There is insufficient evidence to specify which measure of body habitus (i.e., body mass index [BMI] or neck circumference) is more predictive of OSA.

Evidence Summary

Nine cross-sectional studies examined the predictive value of varying clinical characteristics in patients with OSA. Almost all study participants were from referral populations. Varying apnea-hypopnea index threshold values were used to define OSA.

Four studies found a statistically significant association between male sex and OSA,[1-4] whereas one study found no association.[5] Other studies have demonstrated that persons who snore have an increased risk of OSA,[2,6] and that there is a statistically significant correlation between breathing pauses and OSA (odds ratio [OR] = 2.09 to 2.47).[2,4]

Several studies examined the relationship between age and OSA, with conflicting results.[1,2,4,7-9] One study found a statistically significant association between older age (as measured in 10-year increments) and increased prevalence of OSA,[2] and another showed a nine- to 11-fold increased prevalence of OSA in persons 20 to 65 years of age.[8,9] However, other study results did not demonstrate a statistically significant relationship between age and OSA.[1,4,7]

There is also a link between a larger waist-to-hip ratio and OSA (OR = 1.07 to 3.41).[1-3,5] Two studies determined that a BMI greater than 30 kg per m^2 was not an independent variable for OSA,[1,4] whereas two other studies showed that an increasing BMI (in increments of 5.3 or 5.6 kg per m^2) was associated with an increased risk of OSA.[2,3] A BMI greater than or equal to 31.1 kg per m^2 in men and 32.3 kg per m^2 in women was found to be predictive of OSA (OR = 7.8 and 12.8, respectively).[8,9]

Five studies examined the link between neck circumference and OSA, although each study used a different clinical indicator and results were conflicting.[1-5] An incremental increase in neck circumference or percentage of predicted neck circumference (based on height) was found to be significantly associated with OSA (OR = 1.23 to 5.0).[2,3,5] However, two studies found no statistically significant association between OSA and a predetermined neck circumference greater than 43 cm for men and greater than 47 cm for women.[1,4]

Recommendations from Others

According to the Institute for Clinical Systems Improvement, the following clinical indicators may suggest a significant risk of OSA: awakening with choking, hypertension, intense snoring, large neck circumference, male sex, postmenopause, obesity, apnea or choking as reported by sleep partner, atrial fibrillation, and daytime sleepiness.[10]

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REFERENCES

1. Martinez-Rivera C, Abad J, Fiz JA, Rios J, Morera J. Usefulness of truncal obesity indices as predictive factors for obstructive sleep apnea syndrome. *Obesity (Silver Spring).* 2008;16(1):113-118.
2. Young T, Shahar E, Nieto FJ, et al. Predictors of sleep-disordered breathing in community-dwelling adults: the Sleep Heart Health Study. *Arch Intern Med.* 2002; 162(8):893-900.
3. Young T, Palta M, Dempsey J, Skatrud J, Weber S, Badr S. The occurrence of sleep-disordered breathing among middle-aged adults. *N Engl J Med.* 1993;328(17):1230-1235.
4. Ibrahim AS, Almohammed AA, Allangawi MH, et al. Predictors of obstructive sleep apnea in snorers [published correction appears in *Ann Saudi Med.* 2008;28(1):64]. *Ann Saudi Med.* 2007;27(6):421-426.
5. Sharma SK, Kurian S, Malik V, et al. A stepped approach for prediction of obstructive sleep apnea in overtly asymptomatic obese subjects: a hospital based study. *Sleep Med.* 2004;5(4):351-357.
6. Morris LG, Kleinberger A, Lee KC, Liberatore LA, Burschtin O. Rapid risk stratification for obstructive sleep apnea, based on snoring severity and body mass index. *Otolaryngol Head Neck Surg.* 2008;139(5):615-618.
7. Hessel NS, Laman M, van Ammers VC, van Duijn H, de Vries N. Diagnostic work-up of socially unacceptable snoring. I. History or sleep registration. *Eur Arch Otorhinolayngol.* 2002;259(3):154-157.
8. Bixler EO, Vgontzas AN, Lin HM, et al. Prevalence of sleep-disordered breathing in women: effects of gender. *Am J Respir Crit Care Med.* 2001;163(3 pt 1):608-613.
9. Bixler EO, Vgontzas AN, Ten Have T, Tyson K, Kales A. Effects of age on sleep apnea in men: I. Prevalence and severity. *Am J Respir Crit Care Med.* 1998;157(1):144-148.
10. Institute for Clinical Systems Improvement. Diagnosis and treatment of obstructive sleep apnea. 6th ed. Bloomington, Minn.: Institute for Clinical Systems Improvement; June 2008. http://www.icsi.org/sleep_apnea/sleep_apnea__diagnosis_and_treatment_of_obstructive_.html. Accessed August 2, 2010. ■