Obstructive Sleep Apnea:
Finding the Solution

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Obstructive sleep apnea (OSA) is one of the most common chronic conditions in the adult North American population. Recent evidence suggests that up to 20% of adults in North America may be suffering from this disorder.[1] This increase in OSA prevalence is most likely secondary to increased awareness of this disorder as well as the epidemic of obesity.

OSA affects all age groups. Even though it is more common in men, it is more common in post-menopausal women than previously thought. OSA has been recognized with increasing frequency in children. Current estimates suggest that 2% to 3% of children have OSA.

Untreated OSA results in excessive daytime somnolence, fatigue, poor quality of life and increases the risk of motor vehicle crashes, arterial hypertension, stroke and heart failure.[2-4]

Meet Arthur

Arthur, a 55-year-old male, is returning to your office for arterial hypertension.

During this appointment, his wife mentions loud and disruptive snoring and witnessed apneas.

She has recently seen a program on television about obstructive sleep apnea (OSA) and is worried about the consequences of this condition.

Clinical presentation

A typical patient presents with loud snoring, excessive daytime somnolence and witnessed apneas. Such a patient is usually obese (BMI > 30 kg/m^2) and often has arterial hypertension. Not all patients, however, present with such classical clinical features. Primary care practitioners need to obtain a more detailed history and ask about fatigue, cognitive problems, sleep quality, history of frequent awakening and nocturia. Since patients commonly underreport these symptoms, collateral history from a bed partner should be obtained whenever possible.

Risk factors for OSA

Age, male gender, elevated BMI, increased neck circumference and abnormal upper airway have all been identified as risk factors for OSA. Obesity remains the main modifiable risk factor. It is estimated that even a 10% increase in weight results in as much as a 30% increase apnea/hypopnea index, a common measure of OSA severity. There is likely a familial predisposition to this disorder; therefore, careful family history of snoring, witnessed apneas and excessive daytime somnolence in first-degree relatives needs to be obtained.

Physical examination

When evaluating a patient for possible OSA, attention needs to be paid to neck circumference, anatomy of the upper airway, mandibular

position and thyromental space. Even though not a single physical exam finding can confidently rule in or rule out OSA, the combination of elevated BMI, neck circumference > 40 cm and an abnormal Mallampati score significantly increases the pre-test probability of OSA.

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Estimating daytime sleepiness

Daytime sleepiness is the most common symptom of OSA, but it is quite non-specific. Daytime sleepiness may also be due to sleep deprivation, medication use or other sleep conditions such as narcolepsy. Estimation of degree of sleepiness in clinical practice is not easy. One of the most common measures of subjective sleepiness is Epworth Sleepiness Scale.[5] Epworth Sleepiness Scale asks the patient to rate their sleepiness on a scale from zero to three in eight common situations. The maximal score is 24 which indicates severe excessive daytime somnolence. In general, scores from zero to 10 are considered normal.

When evaluating a patient's sleepiness, it is helpful to obtain collateral history as patients often underestimate the severity of their impairment due to somnolence. Patients should be asked about somnolence when driving, working or at school.

Diagnosis

In the majority of patients with suspected OSA, diagnostic tests are necessary as clinical evaluation alone does have a sufficient negative or positive predictive value to either exclude or confirm OSA. The traditional gold standard for OSA diagnosis has been an in-lab overnight polysomnography with one to two nights in the sleep laboratory. Usually a referral to a specialist is required for initial evaluation.

As access to diagnostic sleep facilities in parts of Canada is often limited, alternative diagnostic techniques are used. Increasing use of home monitors for diagnosis of OSA has been evaluated by the American Academy of Sleep Medicine.[6] These devices typically monitor:

- airflow,
- oxygen saturation,
- heart rate,
- respiratory effort and
- body position.

In selective patients with moderate to high pretest probability of OSA and no other comorbidities, these devices can be sufficient to establish the diagnosis. However, this technology should be implemented only in highly selective patients under the supervision of qualified sleep laboratory staff. It must be recognized that a negative home test does not have a sufficiently negative predictive value to exclude OSA and should prompt further testing with in-lab polysomnography.

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Therapy

Recent Canadian Thoracic Society Guidelines provide a summary of diagnostic and therapeutic approaches to OSA.[7]

Whenever possible, modifiable risk factors such as obesity, smoking and alcohol intake should be addressed. Patients should be provided with education about OSA, its consequences and sleep hygiene.

In the majority of cases, lifestyle modification alone does not provide adequate treatment of OSA. In patients with moderate to severe OSA, continuous positive airway pressure (CPAP) therapy is the treatment of choice. There have been significant advancements in CPAP technology over the past few years which have resulted in the development of self-adjusting (auto-titrating) CPAP units and fixed pressure CPAP units which provide a transient pressure decrease during expiration (*i.e.*, C-flex or expiratory pressure relief). In selected patients, auto-CPAP could be used either in-lab or at home to determine optimal CPAP pressure. Auto-CPAP units may also be used for long-term OSA therapy, although in most cases they offer no benefit over traditional fixed pressure CPAP units.

Mandibular advancement devices provide an alternative to CPAP in patients who are intolerant to CPAP or those with mild OSA. A referral to a dentist experienced in these devices needs to be considered for those patients.

While upper airway surgery (tonsillectomy and adenoidectomy) is the therapy of choice for OSA in children, surgical therapy for adults with OSA is still controversial. In some centers, in highly selected cases, reasonable success rates have been achieved with surgical intervention. Patients referred for surgery should undergo careful upper airway evaluation and polysomnographic testing prior to and after the procedure, as success rates vary.

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Take-home message

1. OSA is one of the most common chronic conditions
2. OSA is more common in post-menopausal women then previously thought
3. OSA is an independent risk factor for CV disease
4. Continuous positive airway pressure (CPAP) therapy is an effective treatment for OSA
5. Mandibular advancement devices are an alternative to CPAP in selected patients

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