Approach to Internal Medicine

A Resource Book for Clinical Practice

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Obstructive Sleep Apnea

Fleetham et al. *Can Respir J* 2011;18(1)

DIFFERENTIAL DIAGNOSIS OF SLEEP DISORDERS

HYPERSOMNOLENCE

- **SLEEP DISRUPTION**—obstructive sleep apnea (OSA), periodic limb movement disorder
- **INADEQUATE SLEEP TIME**—medicine residents, shift workers

DIFFERENTIAL DIAGNOSIS OF SLEEP DISORDERS (CONT'D)

- **INCREASED SLEEP DRIVE**—narcolepsy, primary CNS hypersomnolence, head injury, severe depression, medications

DIFFERENTIAL DIAGNOSIS OF SLEEP DISORDERS (CONT'D)

INSOMNIA

- **ACUTE**—stress, travel through time zones, illness, medications (steroids), illicit drugs (stimulants)
- **CHRONIC**—conditioned, psychiatric disorders, poor sleep hygiene, medical disorders, pain, restless leg syndrome, circadian rhythm disorder

PARASOMNIA—sleep walking, sleep terrors, nocturnal seizures, rapid eye movement behavior disorder

PATHOPHYSIOLOGY

ABNORMAL PHARYNX ANATOMY—decreased upper airway muscle tone and reduced reflexes protecting pharynx from collapse, increased hypercapnic set point → airway collapse with hypoxemia and hypercapnia → partial collapse leads to snoring and hypopnea, full collapse leads to apnea → terminated with arousal → repeated arousals lead to hypersomnolence. Severe chronic hypoxemia leads to pulmonary hypertension

ASSOCIATIONS—obesity, hypothyroidism, acromegaly, amyloidosis, neuromuscular disease, vocal cord paralysis, nasopharyngeal carcinoma, Down syndrome (macroglossia)

COMPLICATIONS—hypertension, pulmonary hypertension, CAD, CVA, increased motor vehicle accidents

Related Topics
CPAP (p. 113)
Hypertension (p. 70)
Pulmonary Hypertension (p. 20)

CLINICAL FEATURES

HISTORY—daytime sleepiness, habitual snoring, witnessed apneic episodes, poor sleep hygiene, morning headaches, fall asleep while driving, dyspnea, cough, exercise capacity, short-term memory loss, excessive caffeine intake, alcohol intake, past medical history (weight gain, thyroid disease, neurological disease), and medications. The Epworth Sleepiness Scale and STOP-Bang Questionnaire may be used as screening tools

PHYSICAL—vitals (hypertension, hypoxia). Obtain weight and height (BMI often >30 kg/m^2). Asterixis and plethora secondary to hypercapnia. Check for low-hanging soft palate, large uvula,

CLINICAL FEATURES (CONT'D)

enlarged tonsils, retrognathia, micrognathia, ↑ neck circumference (>42 cm [>16.5 in.] for ♂, >39 cm [>15.4 in.] for ♀), and acanthosis nigricans. Perform respiratory and cardiac examination (hypertension and pulmonary hypertension, restrictive lung disease). Inspect for potential causes such as nasopharyngeal carcinoma, hypothyroidism (goiter), acromegaly (course facial structures), and amyloidosis (periorbital infiltrate, shoulder pad sign)

RATIONAL CLINICAL EXAMINATION SERIES: DOES THIS PATIENT HAVE OBSTRUCTIVE APNEA?

	LR+	LR–
Symptoms		
Nocturnal choking/gasping	3.3	0.57
Morning headache	1.5–3.8	0.73–0.93
Reported apnea	1.4	0.47
Excessive daytime sleepiness	1.3–1.4	0.80–0.81
Snoring	1.1–1.5	0.12–0.60
Signs		
Mallampati Class 3 or 4	1.6	0.60–0.68
Pharyngeal narrowing	1.4	0.63
Combination of Findings		
Overall clinical impression	1.7	0.67
STOP-Bang Questionnaire	1.4–1.8	0.20–0.23
Snoring Severity Scale ≥4 and BMI ≥26	1.6	0.07
Sleep Apnea Clinical Score (SACS) >15	5.2	–
Sleep Apnea Clinical Score (SACS) ≤5	0.25	–

APPROACH—obstructive sleep apnea is common (2–14% in community screened patients) and is associated with HTN, HF, diabetes and arrhythmia. Individual signs and symptoms lack diagnostic accuracy and are insufficient to rule in/rule out OSA. Snoring is non-specific but patients with a normal BMI who do not snore are unlikely to have OSA. Multi-item questionnaires (e.g. STOP-Bang Questionnaire) may identify patients at low risk of OSA. The Sleep Apnea Clinical Score requires further validation before use for screening in primary care

Myers et al. *JAMA* 2013;310(7)

INVESTIGATIONS

POLYSOMNOGRAPHY
ABG
PFT

MANAGEMENT

LIFESTYLE CHANGES—sleep hygiene (avoid daytime napping, avoid caffeine, reduce alcohol intake, exercise regularly but not immediately before sleep, maintain regular sleep schedule, ensure comfortable sleep environment without noises or bright light), restrict body position during sleep

TREAT UNDERLYING CAUSE—for patients with obstructive sleep apnea, recommend weight loss (diet, exercise, weight management program; consider referral for bariatric surgery if BMI >40 kg/m^2 or >35 kg/m^2 with serious comorbid disease), avoidance of alcohol/sedatives. CPAP is the gold standard for therapy. Other options include orthodontic devices to hold lower jaw forward and surgical procedures such as tracheostomy, tonsillectomy, nasal surgery, uvulopalatopharyngoplasty; however, therapies other than CPAP are not generalizable. Thus, every effort should be made to treat with CPAP

TREATMENT ISSUES

PATIENTS WITH OBSTRUCTIVE SLEEP APNEA AND HF—optimization of HF therapy first, then consider trial of CPAP therapy for 3 months if OSA still persists; CPAP can ↑ ventilation during sleep, ↓ hypoxemia, ↑ sleep quality, and ↑ cardiac function (↓ LV transmural pressure and improves cardiac output)

SPECIFIC ENTITIES

OBESITY HYPOVENTILATION SYNDROME (OHS)—also known as Pickwickian syndrome. Defined by hypoventilation (awake $PaCO_2$ >45 mmHg) in the absence of other causes of hypoventilation. OHS patients have sleep disordered breathing, and most have OSA. BMI is usually >35 kg/m^2. Treatment options include respiratory stimulants, ventilatory support (non-invasive ventilation), oxygen therapy, and weight loss

NARCOLEPSY—severe daytime hypersomnolence, cataplexy (loss of postural tone, usually with emotions), sleep paralysis (usually happens after sleep–wake transition), hypnagogic hallucinations (visual or auditory hallucinations during drowsiness)

RESTLESS LEG SYNDROME

- **PATHOPHYSIOLOGY**—associated with iron deficiency, hypoparathyroidism, uremic neuropathy, diabetic neuropathy, rheumatoid arthritis, and fibromyalgia
- **CLINICAL FEATURES**—desire to move extremities, associated with paresthesias, dysesthesias, and motor restlessness (floor pacing, leg rubbing). Symptoms tend to be worse at rest, particularly in the evenings and at night. Relieved by activity
- **TREATMENTS**—dopamine agonists (pergolide, pramipexole, or ropinirole), levodopa/carbidopa, gabapentin, clonazepam, and oxycodone if precipitated by pain. A trial of iron therapy is indicated in all patients even in the absence of overt iron deficiency