Sleep Problems in the Primary Care Setting

Eilis Boudreau M.D., Ph.D.
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Overview

- What is normal sleep?
- How is sleep regulated?
- What are the most common sleep disorders?
  - Restless Legs Syndrome
  - Sleep Apnea
  - Insomnia

“Biopsychosocial” Model of Sleep

Optimal Sleep

Circadian Process

Homeostatic Process

Sleep
Sleep Requirements

- Average adult: 8 - 9 hours
- Epidemiology: sleep > 9 hours or < 4 hours have higher chance of death secondary to CAD, stroke and cancer vs 7 - 8 hour/night sleepers

Age-Related Changes in Sleep: Elderly

- ↑ in variability from individual to individual
- ↑ in sleep apnea
- ↑ in Restless Legs Syndrome
- ↑ in pain
- ↑ in nocturia
- ↓ in sleep efficiency (80-85%)

Factors Impacting Sleep

Optimal Sleep
Restless Legs Syndrome & Periodic Limb Movements

Restless Legs Syndrome

Periodic Limb Movement Disorder

Periodic Limb Movements

How is Restless Legs Syndrome Diagnosed?

Restless Legs Syndrome

• Urge to move legs, usually accompanied or caused by uncomfortable and unpleasant sensations in the legs.
• Urge to move or the unpleasant sensations begin or worsen during periods of rest or inactivity.

Taken from International Classification of Sleep Disorders, third version, 2014.
Restless Legs Syndrome

- Urge to move the legs or unpleasant sensations are partially or totally relieved with movement.
- Urge to move or unpleasant sensations in the legs are worse, or only occur, in the evening or night.

Taken from International Classification of Sleep Disorders, third version, 2014.

RLS is Clinical Diagnosis

- Urge to move legs
- Urge starts while resting
- Worst at night
- Relieved with movement

No Sleep Study is Needed for Diagnosis.

Periodic Limb Movement Disorder

- Sleep study demonstrates repetitive, highly stereotyped, limb movements (0.5 to 5 seconds in duration; sequence of at least 4 leg movements in less than 90 sec)
- Patient has a sleep disturbance of complaint of daytime fatigue.

Taken from International Classification of Sleep Disorders, third version, 2014.
Periodic Limb Movements in Sleep

- Sleep study demonstrates repetitive, highly stereotyped, limb movements (0.5 to 5 seconds in duration; sequence of at least 4 leg movements in less than 90 sec)
- Patient DOES NOT have a sleep disturbance of complaint of daytime fatigue.

Taken from International Classification of Sleep Disorders, third version, 2014.

RLS vs PLMD vs PLMS?

- Restless Leg Syndrome
- Periodic Limb Movement Disorder
- Periodic Leg Movements in Sleep

- Clinical diagnosis
- Clinical and sleep study diagnosis
- Sleep study diagnosis

Relationship Between RLS, PLMD, and PLMS

- 30% of patients with periodic limb movements in sleep have clinical symptoms of Restless Leg Syndrome
- 80% of patients with symptoms of RLS have Periodic Limb Movements in Sleep
What Causes RLS?

• Exact cause is not known.
• Several theories.

What Causes RLS?

• Iron Deficiency
  - Ferritin is measure of iron stores in the body.
  - Ferritin levels may be low in individuals with RLS.
  - Iron replacement may help some people with symptoms.
  - Iron levels in parts of the brain (substantia nigra) may be lower in RLS.

What Causes RLS?

• Not exactly known.
• Dopamine and iron seem to be important.
• Genetics component
• Single Nucleotide Polymorphisms (SNPs) identified
**RLS**

- Genetic contribution to RLS
- 1/3 patients have symptoms prior to age 20
- Limb movements can start before RLS symptoms
- Family members of individuals with RLS have more limb movements

**RLS: Approach to Therapy**

- Co-morbidities
- Medications
  - Caffeine, alcohol, nicotine

**RLS: Approach to Therapy**

- 1st Line Therapy
  - Dopaminergic drugs
  - GABAergic
Sleep Disordered Breathing

- Definition = "disordered breathing during sleep"

Why Treat Sleep Disordered Breathing?

- Daytime fatigue & poor performance
- Prevent long-term complications

Clinical Features

- Snoring
- Witnessed apneas
- Excessive Daytime Sleepiness
- AM Headaches
- Nocturia
- Poorly refreshing sleep
Risk Factors

- Weight
  - 10% increase in weight ---> 6-fold increased risk in going from mild to moderate/severe apnea
  - 1% ↑ in weight → 3% ↑ in AHI

Peppard PE et al., JAMA 2000 (Wisconsin Cohort)

Risk Factors

- Neck circumference (>16 inches F; > 17 inches M)
- Body Mass Index (BMI)
- Age
- Gender
- Craniofacial abnormalities

SLEEP APNEA EPIDEMIOLOGY
**SLEEP APNEA PATHOPHYSIOLOGY**

<table>
<thead>
<tr>
<th>Organ System</th>
<th>Pathophysiology</th>
<th>Consequences</th>
</tr>
</thead>
</table>
| Cardiovascular | • Increased preload & afterload  
                  • Left-shift of IV septum  
                  • Decreased left ventricular compliance | • Hypertension  
                  • Supraventricular and ventricular ectopies  
                  • Increased A-fib  
                  • Opening of PFO  
                  • Exacerbation of CHF |
<p>| Pulmonary     | • Hypoxemia      | • Transient or sustained pulmonary hypertension |</p>
<table>
<thead>
<tr>
<th>Organ System</th>
<th>Pathophysiology</th>
<th>Consequences</th>
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</thead>
<tbody>
<tr>
<td>Hematologic</td>
<td>• Increased platelet adhesiveness</td>
<td>• Stroke</td>
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<tr>
<td></td>
<td>• Decreased fibrinogen levels</td>
<td></td>
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<td></td>
<td>• Decreased fibrinolytic activity</td>
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<tr>
<td>Endocrine</td>
<td>• Increased leptin levels</td>
<td>• Weight regulation</td>
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<td></td>
<td>• Increased insulin resistance</td>
<td>• Poor glucose control</td>
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<td></td>
<td>• Increased atrial natriuretic</td>
<td>• Nocturia</td>
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<td></td>
<td>peptide secretion</td>
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<td>Immune</td>
<td>• Increased secretion of</td>
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<td>inflammatory mediators</td>
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<td>• Increased oxidative stress</td>
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**Case – Mr. Smith**

- Mr. Smith underwent split-night polysomnography and was found to have an apnea-hypopnea index of 50 events/hr and was subsequently started on CPAP therapy.

**Definitions**

- **Apnea**: absence of airflow for at least 10 sec
- **Hypopnea**: ↓ in airflow for at least 10 secs (with desaturation or arousal)
Apnea-Hypopnea Index (AHI)

- Apnea-Hypopnea Index:
  (# apneas + # hypopneas)/total sleep time (hrs)
  (30 apneas + 90 hypopneas)/6 hrs = 20

Apnea Severity

Treatments

- CPAP/BiPAP therapy (considered optimal)
- Alternate
  - Oral appliance
  - Surgery (UPPP)
  - Tracheostomy
Why Treat Sleep Disordered Breathing?

- Daytime fatigue & poor performance
- Prevent long-term complications

Insomnia

- Physiology
- Behaviors
- Environment

Taking an Insomnia History

- When did it start?
- How is it impacting their daily life?
- Mitigating factors (psychosocial triggers, medication changes, family history)?
Treating Insomnia

• Behavioral therapies
  – Cognitive Behavioral Therapy (CBTi)
  – Optimizing Sleep Hygiene

• Medications
  – Zolpidem
  – Melatonin
  – Trazadone

Key Points

• RLS
  – Clinical diagnosis

• Sleep Apnea
  – Treat to improve wakefulness & prevent complications

• Insomnia
  – Identify underlying etiology and contributing factors

Case

• Mr. Jones is a 55 yr-old veteran who complains of problems getting to sleep and feeling poorly rested in the morning. He has hypertension, diabetes, coronary artery disease, PTSD, and atrial fibrillation.
Case – Mr. Jones

- Mr. Jones reports that when he watches T.V. in the evening he feels he has to shift positions frequently to get comfortable. This also happens when he is riding as a passenger in a car for prolonged periods of time.

Case – Mr. Jones

- Mr. Jones' wife reports he has to get up multiple times at night to use the bathroom, feels poorly rested in the morning, and has a dull AM headache that last 30-60 minutes.