Use of Clinical Tools and Tests in Sleep Medicine

Kryger Chapter 60

Overview

- **There are different clinical assessments for diagnosing sleep problems**
- **Physician combines info from different sources, weighs the evidence/data, and comes up with a diagnosis and treatment plan**
- **Four most common clinical sleep problems:**
  - **Sleep-disordered breathing**
  - **Hypersomnolence**
  - **Insomnia**
  - **Parasomnias**

Evaluation for SDB

- **Most common class of disorders diagnosed at US sleep centers**
  - **OSA counts for nearly 70% of all patients evaluated**
- **History and Questionnaires**
  - **Interviews help to get subjective view of patient and bed partner/family members**
  - **Gathers symptoms, routine, family history, medical history, and more**

Evaluation for SDB

- **ICSD-3 has PSG criteria to establish a diagnosis of OSA**

- **Histories factor into evaluation of PSG data and diagnosis**

- **Clinical value to data varies**
  - **For example, for a patient with possible OSA, the symptom of EDS and snoring may not be as big of an indicator for OSA as a history of hypertension to a particular physician**
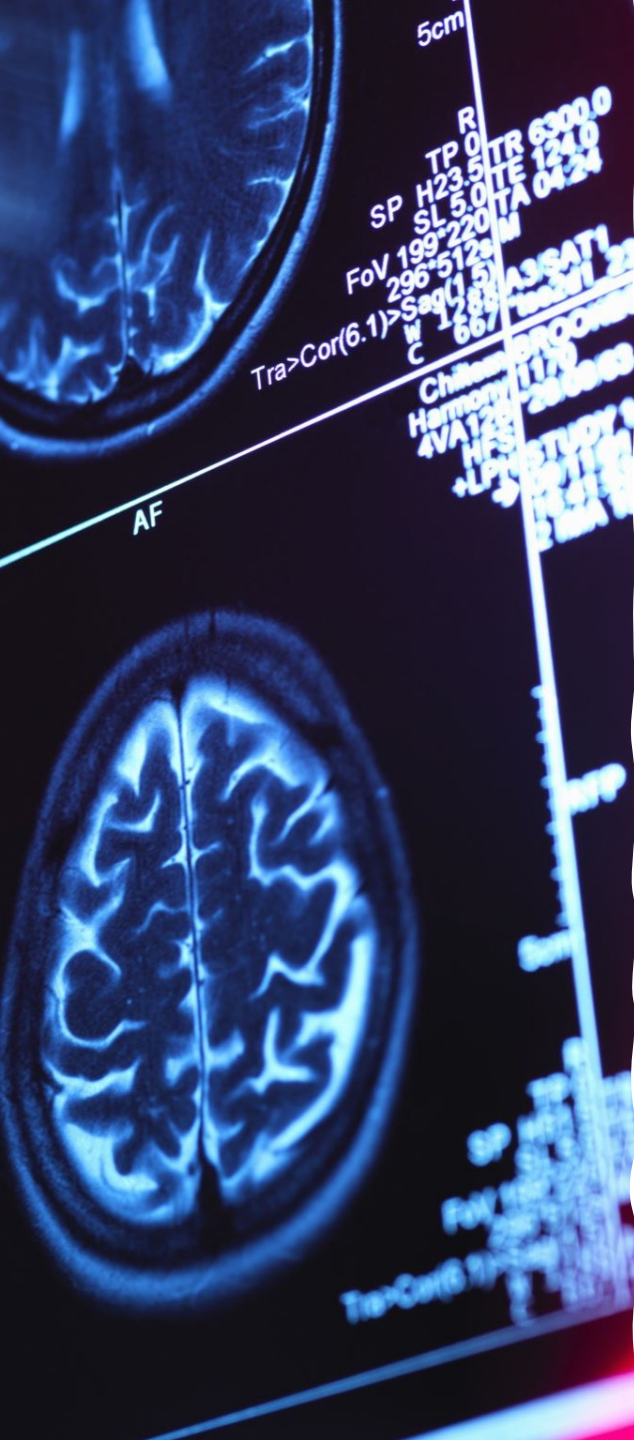
Evaluation for SDB

- **Physical Exam**
  - **Looks at:**
    - **Body weight**
    - **Neck circumference**
    - **BMI**
    - **Pharyngeal crowding**
    - **Obstructed nasal passages**
    - **Craniofacial abnormalities**
    - **Mallampati grade**
    - **Tonsil size**

Nocturnal Polysomnography

- **Lab-based PSG most common test for diagnosis of OSA**
  - **Gold standard for diagnosis of OSA, assessment of severity, and identification of other sleep disorders**
  - **Quantifies respiratory events and physiologic consequences**
    - **Hypoxemia**
    - **Arousals/Awakenings**
  - **Single night recording usually sufficient to diagnose or rule out OSA**
  - **Accuracy of diagnosis dependent on equipment, human scoring, and scoring protocols**

Nocturnal Polysomnography

- **Scoring standards were the same for nearly 4 decades – R & K**
  - **2007 – AASM released new scoring guidelines and recommendations for PSG equipment**
    - **Included scoring rules for abnormal respiratory events, EKG findings, movements, and arousals**
    - **Made modifications for pediatric scoring**
    - **Guidelines required for all AASM accredited sleep labs**

Nocturnal Polysomnography

- **AASM Scoring Manual**
  - **Hypopnea rule conformed to Medicare standards**
    - **Alternative rule allowed for recognition of hypopneas without desaturation that led to arousals**
  - **Not all rules are included, which allows labs to set up some of their own protocols**
- **Current insurance rules state that a patient must have an AHI of 5 or greater to be diagnosed with OSA**

Nocturnal Polysomnography

- Evaluation without patient history can lead to serious underdiagnosis or overdiagnosis

- AHI > 5 does not always correlate with daytime sleepiness, but may correlate with cardiovascular morbidity

- Some patients with RERAs may have EDS, but because of no significant desaturations, don't meet the qualifying AHI for treatment

- PSG is single most useful and definitive test to diagnose SDB, but info must be interpreted by sleep medicine physician with proper experience and taken in context of patient data to be accurate

Modified Forms of PSG

- Daytime nap studies and split-night studies may reduce costs and speed up evaluation time
  - But there are problems encountered by both
    - Inconsistent results with daytime testing
    - Split-night therapeutic results dependent on patient reaction and adjustment time to therapy
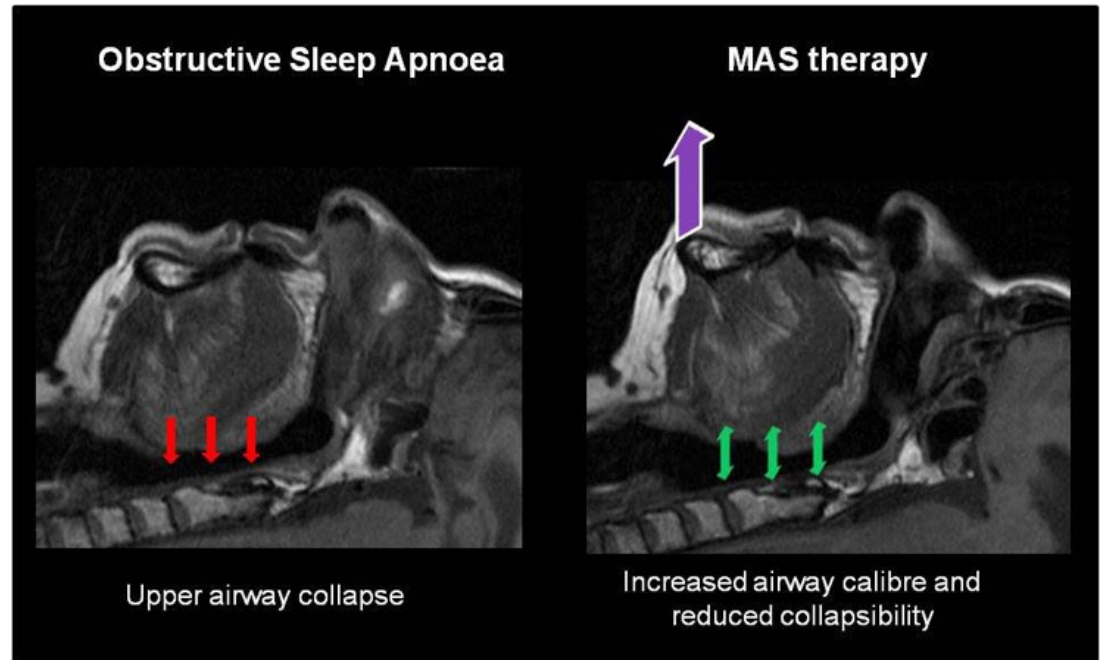
Home Sleep Tests

- **Home testing being more widely performed**
  - **Required by certain insurances for patients without co-morbidities**
  - **Less costly**
  - **Patients more comfortable at home**
  - **Problematic for diagnosis because no behavioral observations, can't address technical problems or make interventions for lost leads**

Home Sleep Tests

- **Most HST devices do not monitor for sleep staging or leg movements**
  - **Can really only identify respiratory parameters but can't be used for detection of other sleep disorders**
- **Results must be integrated into context of patient history and physical exam**
  - **Devices could possibly present false-positive results**
- **Should not be generally used on children or elderly, when co-morbidities present, when other sleep disorders besides OSA suspected, or patient is asymptomatic for OSA**

Studies of Airway Morphology

- **Imaging helps to understand OSA pathophysiology**
- **Computerized tomography and MRI studies can show upper airway restriction but are more expensive**

Obstructive Sleep Apnoea — Upper airway collapse

MAS therapy — Increased airway calibre and reduced collapsibility

Evaluation of Hypersomnolence

- **History provides clues to severity**
- **Ask questions about likelihood of sleepiness in sedentary situations**
  - **Driving**
  - **Desk work**
  - **Reading**
  - **Watching TV**

Evaluation of Hypersomnolence

- Questionnaires provide measure of EDS but are subjective
    - Epworth Sleepiness Scale
    - Stanford Sleepiness Scale
- Impact of sleepiness on activities of daily living can be assessed with Functional Outcomes of Sleep Questionnaire
- Can use sleep logs and actigraphy help to see if sleep patterns are contributing factors

Evaluation of Hypersomnolence

- **PSG usually reveals:**
  - **Shorter sleep latency**
  - **Shorter REM latency**
  - **Increased sleep efficiency**
  - **Decreased N1 sleep**
  - **Increased N3 and REM sleep**
- **If PSG inconsistent with OSA or other sleep findings, MSLT may be ordered**

Evaluation of Hypersomnolence

- **Mean sleep latency on MSLT most commonly used objective measure for EDS**
  - **Most useful when abnormally low (< 8 min)**
  - **Severe EDS indicated by sleep latencies < 5 min**
- **MSLT may contribute to diagnosis but is not standalone for diagnosis**
  - **Use/withdrawal of medications/stimulants may affect results**
- **MWT used for evaluating truck drivers and pilots**

MSLT and Narcolepsy

- **MSLT criteria for diagnosis of narcolepsy:**
  - **2 or more SOREMPs**
  - **Short mean sleep latency**
- **Positive MSLT result essential to diagnose narcolepsy without cataplexy and useful for narcolepsy with cataplexy diagnosis**
- **PSG should precede MSLT for proper diagnosis**

Evaluation of Insomnia

- Causes of insomnia often diagnosed by history alone
- If history does not indicate cause, PSG may be used
  - Useful in cases of sleep state misperception
- Referral to specialist for further history taking and evaluation is sometimes necessary
- Sleep logs are important tools
- Actigraphy may be used to assess sleep-wake patterns
- Physical and mental status exams may provide clues to cause of insomnia

Evaluation of Circadian Rhythm Disorders

- **Questionnaires used to help to evaluate circadian preference**
  - **Horne-Ostberg Morningness-Eveningness Questionnaire (MEQ)**
    - **Most widely used instrument to assess chronotype**
    - **19-item self-assessment tool**
    - **Assesses personal preference for sleep timing**
  - **Munich Chronotype Questionnaire (MCTQ)**
    - **Assesses actual sleep timing not preferred timing**
    - **Compares sleep on work/school days vs. free days**
- **AASM recommends use of sleep logs and actigraphy for 7-14 days for diagnosis**
- **PSG or MSLT not necessary for diagnosis**

Evaluation of Restless Legs Syndrome

- **Diagnosis made by clinical history**

- **Instruments used for RLS assessment:**
  - **International Restless Legs Scale (IRLS)**
    - **10 item questionnaire assessing severity of RLS symptoms**
  - **RLS-6**
  - **Johns Hopkins Severity Scale**

- **Full neurologic exam is indicated for diagnosis to rule out other neurologic diseases**

- **Serum iron and ferritin level testing should also be included in evaluation**

- **PSG not routinely indicated for diagnosis**

Evaluation for Parasomnias

- With exception of RBD, parasomnias can often be diagnosed on history alone

- Info from bed partner or family member can offer more insight usually than from patient alone

- Descriptions of symptoms helpful for diagnosis of:
    - Sleep terrors
    - Rhythmic movement disorder
    - Sleep paralysis
    - Sleep bruxism
    - Sleep enuresis

Evaluation for Parasomnias

- Frequently require clinical clarification though for diagnosis

- Physical exam may point out useful info but not of much value

- PSG value is questionable, depending on if patient has a parasomnia episode while being tested