Objectives

- Understand general characteristics of pediatric obstructive sleep apnea (OSA)
- Identify physical and neurocognitive features associated with pediatric OSA
- Discuss appropriate screening, evaluation, and treatment of pediatric OSA
Introduction

- Episodes of complete or partial upper airway obstruction during sleep
- Often results in gas exchange abnormalities and disrupted sleep
- Occurs in approximately 2-5% of children with snoring in 12% of children
- Most common in 2-6 year olds
- Associated with neurocognitive problems, FTT, cardiovascular complications

Risk Factors

- Adenotonsilar hypertrophy
- Obesity
- Neuromuscular weakness (CP, MD)
- Craniofacial anomalies (midface hypoplasia, retro/micrognathia)
- Prematurity
- Orthodontic problems (crossbite, high arch)
- Family History
- Genetic syndromes (Down, Crouzon, Achondroplasia, Mucopolysaccharidoses, )

Screening

- AAP recommends screening all children for snoring at routine health visits
- Children with ADHD, behavioral problems or poor school performance
- Cardiovascular problems (HTN, PHTN)
- Complex/high risk patients
- Chronic parasomnias
Diagnosis

• History
  • Snoring
  • Pauses, gasps
  • Mouth breathing
  • Restless sleep
  • Airway protective maneuvers
  • Protracted parasomnias
  • Nocturnal enuresis (23 of 36 pts resolved after adenotonsillectomy)

Daytime Symptoms

• Hyperactivity/impulsivity
• Excessive daytime sleepiness
• Learning problems
• Morning headache
• Morning dry mouth

Physical Exam

• Most children have normal exam
• Growth: Obese or poor growth
• BP and heart exam
• Head and neck
  • Adenotonsilar hypertrophy
  • Craniofacial abnormalities
  • Orthodontic findings
Polysomnography
• Required to diagnose (history and PE not specific enough)
• Overnight sleep lab PSG is gold standard
• Little night to night variation
• Predicts perioperative risk and cure rate
• Nap PSG reserved only for young (good positive predictive value, poor negative predictive value)

Case Against Routine PSG
• $$$$
• Lack of availability
• Habitual snoring alone linked to adverse outcomes
• Adenotonsillectomy in habitual snoring results in clinical improvement

> Yellen, Laryngoscope 2010

Polysomnography
Severity
• Mild OSA — Apnea Index 1-4
• Moderate OSA — Apnea Index 5-10
• Severe OSA — Apnea Index >10
• Upper airway resistance syndrome
• Obstructive hypoventilation
Treatment
- Adenotonsillectomy
- CPAP/BiPAP
- Nasal steroid/Leukotriene modulator
- Weight loss
- Position
- Avoidance of airway irritants
- Additional surgeries (supraglottoplasty, mandibular distraction, tracheostomy)

Case 1
- 8 yo female, Somali refugee with limited medical care except for an event when she was 3 yo and “almost died.” Snores and inadvertently dozes.
- PE: Down’s facies, generally hypotonic with right sided spastic hemiparesis, tonsillar hypertrophy and mouth breathing.

Initial PSG
Follow Up PSG

Case 2

- 14 yo male with Duchenne Muscular Dystrophy, obesity, wheelchair bound with snoring.

Hypnogram
Case 3

- 3 yo male with snoring, overactivity, and "kissing tonsils"

Conclusion

- Obstructive sleep apnea is a significant clinical problem that is most likely underdiagnosed
- It is associated with behavioral and neurocognitive difficulties
- We need to remain vigilant in screening for OSA especially with increasing obesity rates in childhood
Thank You

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