Episode 82: Pediatric OSA

On this episode: Dr. Jed Wolpaw and Dr. Deb Schwengel

In this episode, episode 82, I welcome Dr. Deb Schwengel back to the show to discuss pediatric obstructive sleep apnea (OSA). We discuss the prevalence, diagnosis and preoperative management. Check us out on Anesthesiologynews.com

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How common is OSA?

- Less so than adults but becoming more prominent as the number of obese children is rising. OSA in 1-6% of obese children, 25% of adults, 70% of bariatric patients.
- Obese children are less likely to be cured with tonsillectomy vs non-obese due to comorbidities. OSA was considered a mechanical disorder, but now more understood as a

multi-system disorder. Some call it OSAS (OSA Syndrome) due to the immune, cardiovascular, metabolic, and nervous system effects.

What are the phenotypes of OSAS?

- Traditional: big tonsils/adenoids, lots of lymphoid tissue growth, typically 2-8 year olds
- Obese: becoming most prominent; genetics may influence failure of weight loss to cure OSA
- Craniofacial disorders: more in younger age group
- Neuromuscular disorder: at risk throughout life

What is the pathophysiology?

- Obstruction at some level in pharynx. Compared to adults, children
    - Have stiffer airways, so less likely for complete collapse. During sleep studies, kids will more likely to have hypopnea.
    - Are more stage-specific. Children tend to have OSA during REM sleep.
    - Have smaller airways, which means more obstruction from any additional tissue (lymphoidal, obese, mucopolysaccharide deposits..).
    - Are affected by neurological dysfunction, such as decreased arousal threshold to hypercarbia, and dysfunctional response to airway pressures.
- Genetic predisposition: more in African-American
- Inflammatory etiology: elevation in pro-inflammatory cytokines. Asthma is similar disorder. Positive feedback loop between asthma and OSA.

How to diagnose OSA?

- Gold standard: polysomnogram. The sleep study is not necessarily the best test for several reasons. Kids need to reach REM sleep but can be difficult when tasked to sleep in an unfamiliar bed and attached to wires all night. Rural areas may not have a sleep lab, much less a pediatric one, so scoring is not as accurate.
- Use STOP-BANG as a screening and educational tool for children.
    - Snoring → probe more if yes
    - Tiredness
    - Observed apnea
    - Pressure/hypertension
    - BMI
    - Age
        - <2: craniofacial, neuromuscular, premature
        - 2-8: lymphoid hypertrophy
        - >8: adult style, obese, metabolic syndrome
    - Neck circumference
    - Gender (older age group → males)
- Montreal group found that home pulse oximetry can be helpful. People hitting nadirs < 80-85 are at risk of OSA.

How is severity of OSA measured?

- AHI (apnea-hypoxia index) or RDI (respiratory disturbance index) events measured in an hour
- 1-5: mild & sat > 92%
- 5-10: moderate
- 10+: severe or sat 80-85%
- Some capture with end tidal CO2 as well

What are some guidelines for managing OSA?

- Likely won't order a sleep study for children, so consider who's at risk.
- Hypotonic kids might not generate noise so snoring might not be the best way to screen. 70-80% of Downs Syndrome have snoring so assumed to have it. At risk so keep overnight.
- Opioids are a risk factor for OSA. According to the Montreal group, cut the morphine dose in half. If you plan to give 0.1 mg/kg to a patient with severe OSA, give only 0.05mg/kg.
- Use modalities to help maintain open airway, eg regional, avoid opioids, use dexmedetomidine, more NSAIDs.
- Tonsillectomy patients have two main complications to watch for:
    - Airway obstruction after surgery
    - Post-tonsillar hemorrhage
- Avoid aspirin!
- Other meds:
    - Dexamethasone: no clarifying dose study for pain and tonsillectomy
    - Montreal group: half-dose morphine, more dexamethasone (0.3 mg/kg)
    - No more codeine due to FDA black box warning. It's a prodrug, where genetic variation of CYP2D6 enzyme can lead to hypermetabolizing and thus overdose from too much morphine in system.

How to avoid complications during induction/intubation?

- Patients with big tonsils can be managed well with standard inhalation induction. Keep in mind they are more likely to obstruct, so use CPAP and oral airway.
- If extremely severe OSA (eg RDI of 60), put IV in first to bypass stage of airway obstruction and use a faster induction agent like propofol.
- Children don't tolerate awake intubations well.

What should we watch out for during postop?

- In general, children with severe OSA need to stay.
- If you don't know the severity, use your judgement about severity and need for opioid.
- Tonsillectomy does not always cure OSA. There may be persistent disease after the procedure. May take several weeks to reduce swelling and heal. These are considerations to take when deciding whether to admit overnight. Adequate pain management, can drink and stay hydrated.
- Downs Syndrome, neuromuscular disease, obesity, craniofacial, severe asthma – admit.
- One risk for postop hemorrhage is dehydration. Scabs tend to fall off prematurely. Keep them hydrated!
- < 3-year olds admitted because smaller airway, and as a younger patient with OSA, more likely to have comorbid disorders.

How do you manage children with OSA? What kind of screening tools do you use?

Review Questions

Link jumps to appropriate section

What is the gold standard for diagnosing OSA?
What are the main causes of OSA in each age group?
What are the cut-offs for the severity of OSA in children?
How should you change your morphine dose when treating a child with OSA?

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