Sleep-Disordered Breathing in Children and a Critical Review of T&A

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Objectives

- Summarize AAO-HNS and AAP guidelines for Sleep Disordered Breathing and Tonsillectomy in children.
- Identify discordance between guidelines.
- Acknowledge that guidelines work together with physician assessment of individual patients.

2011

- Tonsillectomy Guidelines (AAO-HNS-T):
- Polysomnography Guidelines (AAO-HNS-PSG):
2012

- American Academy of Pediatrics (Marcus, et al., 2012)
  - Diagnosis and Management of OSA
  - 6 pediatric pulmonologists
  - 3 pediatricians
  - 1 pediatric otolaryngologist

Effect of Guidelines

- UK guidelines, 1999
  - 0.2% of children fulfill criteria for recurrent tonsillitis in 2008 study

- Italian T&A guidelines, 2003, 2008:
  - Evaluation of effect, 2013
  - No change in frequency or indication for T&A
    - Except for acute recurrent tonsillitis

Effects of Guidelines

- Laryngoscope 2013:
  - ASPO survey: pediatric otolaryngologists non-compliant.
  - Disagreement between guidelines nearly 20% (Aarts, et al., 2012)

AAO-HNS-T Statement 1: Watchful Waiting for Recurrent Throat Infection

- Paradise criteria (NEJM, 1984)
- Fewer than
  - 7 episodes in the past year
  - 5 episodes per year in the past 2 years
  - 3 episodes per year in the past 3 years
  - Document, document, document!
AAO-HNS-T Statement 2: Recurrent Throat Infection with Documentation

- Clinicians may recommend tonsillectomy for recurrent throat infection with the recommended frequency WITH DOCUMENTATION of one or more of the following:
  - Temperature >38.3
  - Cervical lymphadenopathy (tender or >2cm)
  - Tonsillar exudate
  - Positive GABHS

- OR -

- Not fully documented and observe for frequency and features of next two episodes.

Why document?

- Less severe do not gain benefit > risks
- Children who meet the strictest criteria
  - modest benefit
  - may fade by 3 years post-op
- Shared decision-making with family

AAO-HNS-T Statement 3: Recurrent infection with modifying factors

- Clinicians should assess for modifying factors in those who do not meet criteria in Statement 2
  - Multiple antibiotic allergy/intolerance
  - Recurrent severe infections requiring hospitalization
  - PFAPA (periodic fever, aphthous stomatitis, pharyngitis, adenitis)
  - History of PTA
  - Lemierre’s
  - FH of rheumatic heart disease
  - Numerous repeat infections in a household
  - PANDAS?

AAO-HNS-T Statement 3: Tonsillectomy for recurrent infection with modifying factors

- Others: school absences affecting performance, very severe sore throats
- Poorly validated:
  - chronic tonsillitis, febrile seizures, hot potato voice, tooth malocclusion, cryptic tonsils, chronic pharyngeal carriage of GABHS
AAP Statement 1
- PCPs should ask about snoring
- PCP should ask about snoring in all children with ADHD

AAP Statement 2A
- If regular snorer or Table 1 features
  - H&P not sufficient
  - Obtain PSG
- UCSF
  - Sleep studies can only be ordered by pulmonologist or otolaryngologist
    - or-
    - Refer to Sleep Specialist or Otolaryngologist

AAP Statement 2B
- If no PSG available
  - Nocturnal video recording
  - Nocturnal oximetry
  - Daytime nap PSG
  - Ambulatory PSG

Realities
- Access to pediatric PSG facilities
- PSG does not measure all effects of snoring
- Financial implication for healthcare cost astronomical
- Medi-Cal now asking for PSG for all patients

AAP Statement 2B
- If no PSG available
  - Nocturnal video recording
  - Nocturnal oximetry
  - Daytime nap PSG
  - Ambulatory PSG

AAO-HNS-PSG Statement 5
- PSG gold standard
- Portable monitoring devices
  - Limited studies in adults
  - Very little in children
  - None assess children with comorbidities
- Additional research needed
- Still significant cost and access issues
AAO-HNS-PSG Statement 1: PSG in high-risk children
- Refer patients for pre-op PSG if:
  - Obesity
  - Down Syndrome
  - Craniofacial abnormalities
  - Neuromuscular disorders
  - Sickle cell disease*
  - Mucopolysaccharidoses

Role of PSG in High-Risk
- Avoid unnecessary procedures
- Diagnostic certainty in high anesthesia risk
- Define severity of SDB for preoperative planning
- Postoperative management
- Provides baseline for postop comparison

AAO-HNS-PSG Statement 2: PSG for Uncertain Presentations
- Children without comorbidities
  - Discordance between tonsillar size and reported symptom severity (#1 reason)
  - Need for surgery uncertain

- Children with large tonsils/nasal obstruction and concordant symptoms can proceed without PSG

Parent Awareness
- Sleep habits and quality
  - Length of sleep
  - How they wake in the am
  - Car/TV/reading/naps
  - Enuresis/tantrums
  - Instruction on listening to sleep

- Behavior
  - Unaware
  - Accustomed
  - Denial
  - OSA-18
AAP Statement 3

- Criteria for T&A
  - Has OSA
  - Adenotonsillar hypertrophy
  - No contraindications

- Issues
  - Not address behavioral
  - Not address treatment when no ATH

Pediatric OHNS
- Children without adenotonsillar hypertrophy
  - Sleep endoscopy

AAO-HNS-T Statement 5: Tonsillectomy and Polysomnography

- Clinicians should counsel caregivers about tonsillectomy as a means to improve health in children with abnormal PSG who have tonsillar hypertrophy and SDB

AAO-HNS-T Statement 4: Tonsillectomy for SDB

- Clinicians should identify conditions that may improve after surgery:
  - Growth retardation
  - Poor school performance
  - Enuresis
  - Behavioral problems
AAO-HNS-PSG Statement 4: Communication

- Communicate PSG results to anesthesiologists prior to induction.

Anesthesia Risks

- Difficult airway
- Abnormal central respiratory drive
- Abnormal cardiopulmonary physiology
- Increased sensitivity to Rx
  - Opioids
  - Nitrous oxide
- Post-operative monitoring for ventilation/oxygenation

Admission recommendations

<table>
<thead>
<tr>
<th>AAO-HNS PSG Guidelines</th>
<th>AAP Guidelines</th>
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<tbody>
<tr>
<td>Under 3 years old</td>
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<tr>
<td>AHI &gt; 10 or 02 sat &lt; 80%</td>
<td>AHI &gt;24 or 02 sat &lt;80%</td>
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<td>Continuous pulse oximetry</td>
<td>Cardiac disease</td>
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<td>Availability of ICU</td>
<td>Failure to thrive</td>
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<td>Obesity</td>
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<td>Craniofacial anomalies</td>
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<td>Neuromuscular disorders</td>
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<td>Current URI</td>
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<td>Very severe OSA</td>
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<td>Comorbidities</td>
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<td>Significant post-op obstruction and desaturation</td>
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Statement 7: Intraoperative Steroids

- Administer a single dose
- For post-op nausea and vomiting
- Throat pain
- 90% post-guidelines (Setabutr, 2013)
AAO-HNS-T: Perioperative Antibiotics
- Should not routinely administer perioperative antibiotics
- 46% still do this (Setabutr, 2014)
- 1/3 stopped after guidelines

AAO-HNS-T Statement 9: Postoperative pain control
- Advocate for pain management after tonsillectomy
- Educate caregivers about the importance of managing and reassessing pain

Pain Control
- Local anesthetic does not improve pain
- Acetaminophen with codeine no better than acetaminophen alone
  - Significant % codeine hypo- and hypermetabolizers
  - FDA black box against codeine for T&A, 2012
- NSAIDS: Cochrane review: 1000 children
  - Not significantly increase post-op bleeding
  - Only 43% using after guidelines (Setabutr, 2014)

Statement 10: Post-tonsillectomy hemorrhage
- Clinicians should determine their rate of primary and secondary post-tonsillectomy bleeding.
AAO-HNS/AAP Statements
Outcome Assessment for SDB
- Counsel that SDB may persist or recur after surgery
- Reassess post surgery at 6 to 8 weeks*
- Repeat sleep study in high risk patients or residual sx

Weight and SDB
- Adenotonsillectomy as risk factor for childhood obesity (Jeyakumar, 2011)

Failure of tonsillectomy
- SDB often is multifactorial
- Obesity
- Craniofacial syndrome
- Effective in 60-70% of children with significant tonsillar hypertrophy
- Only effective in 10 – 25% of obese children

Residual OSA
AAP
- Refer for CPAP in persistent OSA
- Treat mild with nasal steroids

Pediatric OHNS
- Nasal steroids
  - Nasal congestion/allergy
  - Isolated adenoid hypertrophy
  - Turbinate hypertrophy
- Sleep endoscopy
  - Lingual tonsillectomy
  - Turbinate reduction
  - Tongue base advancement
  - Supraglottoplasty
  - Repeat adenoidectomy
- CPAP very poorly tolerated
Summary

- Guidelines for SDB emphasize the complexity of diagnosis of SDB and the role of a multitude of comorbid conditions.
- Several areas of discordance between AAP and AAO-HNS
- Tonsillectomy is a major surgery for which careful perioperative management should be organized.
- Advocate for appropriate use of PSG!

References