
- 33 (85%) met PSG criteria of OSA
- 14 (36%) had severe OSA
  - (OAI > 10, SpO2 < 75%)

- Probably due to
  - Unawareness of physicians and parents
  - Limited access to sleep laboratories

- Boy : girl = 4.5 : 1
- Peak age 3-5 yr
- Adenotonsillectomy was the treatment of choice
Prevalence

- In 1,142 school children, aged 6-13 years
- At Hat Yai, Southern Thailand
- Habitual snoring 8.5%
- Snoring associated with
  - Allergic rhinitis (OR 3.96, 95% CI 1.3-12.2)
  - Tonsillar size (OR > 2.6)
  - Passive smoking (OR 1.75, 95% CI 1-3)

[Anuntaseree, Ped Pulm 2001]

Prevalence

- In 1,142 school children, aged 6-13 years
- PSG conducted in 8 children, who reported sleep-related symptoms
  - 7 had AH1 > 1 /h.
  - None had severe OSA
- OSA 0.7%

[Anuntaseree, Ped Pulm 2001]

Pulmonary Hypertension Detected by Echo / EKG

- Found in 11 of 24 children with OSA
- Nadir SpO2 < 65% was shown to be the most important predictive factor

Eiamudomkal A. et al. Abstract AJRCCM 2001
**QT Dispersion in Childhood OSA**

Khositseth A, Nantarakchaikul P, Kuptanon T, Preuthipan A.
Cardiol Young 2011;21(2):130-5.
Department of Pediatrics, Faculty of Medicine, Ramathibodi Hospital,
Mahidol University, Bangkok 10400, Thailand

**QTd of OSA VS. Control**

![](chart1.png)

- QTd was significantly increased in childhood OSA
- QTd was significantly correlated with BMI
- Obesity may be the important contributing factor for increased QTd in childhood OSA

**Conclusion**

- QTd was significantly increased in childhood OSA
- QTd was significantly correlated with BMI
- Obesity may be the important contributing factor for increased QTd in childhood OSA

**Problems of Childhood OSA in Thailand**

- Late diagnosis, more complications
- Shortage of Ped Sleep Lab
  - expensive
  - time and labor consuming
  - costly equipment
  - lack of well-trained sleep specialists and technicians
Table 3: Validity of parents’ observations in predicting severe OSAS.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed cyanosis</td>
<td>15</td>
<td>92</td>
</tr>
<tr>
<td>Observed obstructive apnoea</td>
<td>61</td>
<td>65</td>
</tr>
<tr>
<td>Snoring extremely loudly</td>
<td>52</td>
<td>78</td>
</tr>
<tr>
<td>Stakes child to make him/her breathe</td>
<td>64</td>
<td>65</td>
</tr>
<tr>
<td>Watches child sleeping, afraid about breathing</td>
<td>93</td>
<td>44</td>
</tr>
</tbody>
</table>
Visual Analog Scale Questionnaire

- The entire visual analog scale ≥ 40 mm was justified as a positive test.
- Sensitivity 83.3%, specificity 47.4%, PPV 75% and NPV 60%

Chuen-im P, Preuthipan A, Kuptanon T, Okascharoen C.
Young Investigator Award, CIPP 2008, Nice, France.

Overnight Pulse Oximetry at Ramathibodi

Cheeplinakornkaworn P, Manoontham A, Preuthipan A.
Am J Respir Crit Care Med 2004;169:A687

Interpretation

- Define one cluster of desaturation as:
  - ≥ 10 dots of SpO₂ < 90% in 30 min. period
- If desaturation ≥ 3 clusters
  - Specificity 100%, Positive predictive value 100%
  - No false positive
- BUT negative result, without any cluster, cannot rule out OSA
  - False negative 26%
  - There is 19% chance to have OSA

Can home video clips predict moderate-to-severe OSA in children?

Nongnaphat Chirawutthinan, MD
Teeradej Kuptanon, MD
Aroonwan Preuthipan, MD, FCCP
Patients were classified into 2 groups

Respiratory events of PSG: Defined according to the American Academy of Sleep Medicine for Scoring of Sleep and Associated Events (2012)

<table>
<thead>
<tr>
<th>PSG</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHI ≥ 10</td>
<td>Moderate-to-severe group</td>
</tr>
<tr>
<td>AHI ≥ 5, &lt; 10</td>
<td></td>
</tr>
<tr>
<td>AHI ≥ 1.5, &lt; 5</td>
<td>Mild group</td>
</tr>
<tr>
<td>AHI &lt; 1.5</td>
<td></td>
</tr>
</tbody>
</table>

Multivariate logistic regression analysis for moderate-to-severe OSA

<table>
<thead>
<tr>
<th>Respiratory pattern</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paradoxical chest movement</td>
<td>9.78</td>
<td>1.1-93.1</td>
<td>0.04*</td>
</tr>
<tr>
<td>2. Continuous snoring</td>
<td>9.73</td>
<td>1.2-76</td>
<td>0.03*</td>
</tr>
<tr>
<td>3. Subcostal retraction</td>
<td>9.73</td>
<td>1.2-76.9</td>
<td>0.03*</td>
</tr>
</tbody>
</table>

Video prediction score formulated by applying important diagnostic factors

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paradoxical chest movement</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>2. Continuous snoring</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>3. Subcostal retraction</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Total video score (Min 0, Max 3)</td>
<td></td>
</tr>
</tbody>
</table>

Correlation between video prediction scores and AHI

Spearman correlation = 0.64
*P value < 0.001

Conclusions

- Home video clips are shown to be a promising screening method to predict moderate-to-severe OSA in children.
- Paradoxical chest movement, continuous snoring and subcostal retraction are the 3 most useful respiratory patterns observed on video clips.
Clinical application

- When total prediction score $\geq 2$, the patient most likely has moderate-to-severe OSA
- That child should be urgently referred to a sleep specialist

Obstructive sleep apnea syndrome: the Asian perspective
Anonwan Preuthigan
Division of Respiratory, Department of Pediatrics, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

In conclusion, childhood OSAS is not uncommon in Asia. Relatively less awareness of this disease among parents and primary physicians may lead to more severe complications in our children. It is hoped that in the future, when diagnosis remains most public attention, the patients will be diagnosed and managed earlier and more appropriately.

Thank you