Bacteriology of the Adenoid and Association with Clinical Presentation in Paediatric Patients with Adenoid-Related Diseases

Kitirat Ungkanont, Sujeenun Jutakarn, Archwin Tanphaichitr, Vannipa Vathanophas
Department of Otolaryngology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok Thailand

Information/ Background

• The adenoid has an important role as the reservoir of bacteria in the upper respiratory tract in children. The infection and/or hypertrophy of the adenoid are the underlying causes of obstructive sleep disordered breathing (OSDB), sinusitis and otitis media.
• Adenoidectomy is widely accepted as a part of surgical management for OSDB, chronic sinusitis and otitis media with effusion (OME). The aim of adenoidectomy is to eliminate the source of infection and relief of airway obstruction.
• Knowledge gap still exists in the association between the type of pathogenic bacteria in the adenoid and clinical presentations of adenoid-related diseases, eg. age group, diagnoses and the size of the adenoid.
• Identification of pathogenic bacteria should be useful for the management of adenoid-related diseases with antimicrobials and vaccination.

Materials and Methods

• Medical record review: children who had adenoidectomy in our institute between 2005 to 2018.
• Data gathering: demographic data, clinical presentation, diagnosis, operation and bacterial culture (conventional plate and agar technique).
• Adenoid size: lateral skull film, adenoid-nasopharyngeal ratio (A/N) by Fujioka method.
• Univariate & multivariate analyses: type of bacteria versus age, diagnosis and adenoid size.

Results

• 407 children, male 62.4%, female 37.6%, median age 5.9 yrs
• Diagnosis: Figure 1
• Bacterial culture :760 isolates shown in Table 1
• Age had significant association with types of bacteria. (Figure 2)
• Diagnosis of OSDB, sinusitis or OME had no significant association with the type of bacteria in the adenoid.
• Streptococcus pyogenes had significant association with adenoid size greater than 70%.

Table 1: Adenoid bacterial culture

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Number(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemophilus influenzae</td>
<td>199 (26.2)</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>179 (23.5)</td>
</tr>
<tr>
<td>Streptococcus pneumoniae</td>
<td>138 (18.2)</td>
</tr>
<tr>
<td>Moraxella catarrhalis</td>
<td>91 (12)</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>25 (3.3)</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>19 (2.5)</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>18 (2.4)</td>
</tr>
<tr>
<td>Others</td>
<td>91 (12)</td>
</tr>
<tr>
<td>Total</td>
<td>760 (100)</td>
</tr>
</tbody>
</table>

Figure 1: Diagnoses (n = 407)
- 19.2% OME
- 75.2% OSDB
- 5.7% sinusitis

Figure 2: Distribution of pathogenic bacteria in different age groups.
- S.pneumoniae
- H.influenzae
- M.catarrhalis
- S.aureus
- S.pyogenes

• Difference in age had statistical significant association with prevalence of S.pneumoniae, M. catarrhalis, S.aureus and S.pyogenes in the adenoid.
• Streptococcus pneumoniae was more prevalent in the younger age group.
• Staphylococcus aureus was more common in children with increasing age.
• Haemophilus influenzae was fairly common with similar prevalence in all age groups.

Conclusion

• Pathogenic bacteria was found in the adenoid of pediatric patients with OSDB, chronic sinusitis and OME.
• OSDB was the most common adenoid-related diseases requiring adenoidectomy.
• Age group had significant association with specific types of pathogenic bacteria.
• Different diagnosis of adenoid-related diseases (OSDB, sinusitis, OME) had no association with specific type of bacteria in the adenoid culture.