Surface Tonsillar bacteria versus deep Tonsillar bacteria in tonsillitis

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Abstract:
Acute tonsillitis is a common childhood disease, mostly caused by bacteria. It is commonly treated with antibiotics, but fails in substantial proportion of patients and for this surgical intervention – tonsillectomy is required. But with appropriate medical therapies one can avoid many tonsillectomies.

Objectives:
The study is a prospective study done on 50 patients, who underwent tonsillectomy at S.S. Institute of Medical Sciences and Research Centre, Davangere determine the utility and correlation between the surface swab culture and tonsillar core.

Materials & Methods
Immediately after the tonsil excision, tonsil was dipped in povidone-iodine solution for 30 seconds, later it was rinsed in sterile saline solution and sectioned into two pieces under strict aseptic condition. With the help of a sterile swab, another swab was taken from the core of the tonsils taking care without touching the tonsillar outer surface.

Results
18 Staphylococcus aureus were isolated from tonsillar swab culture and 24 from tonsillar core. In 34 cases Streptococcus pyogenes were isolated from tonsillar core only. The other organisms isolated were Klebsiella pneumoniae, Pseudomonas aeruginosa and Coagulase negative Staphylococcus.

Conclusion: our results clearly demonstrate that unlike superficial tonsil swab, tonsillar core cultures gives a representative picture of bacterial content in patients with acute recurrent tonsillitis.

Keywords: Tonsillar, surface flora, Staphylococcus aureus

Introduction:
Acute tonsillitis is a common childhood disease, mostly caused by bacteria. It is commonly treated with antibiotics, but fails in substantial proportion of patients and for this surgical intervention – tonsillectomy is required. Tonsillectomy is a common procedure in pediatric patients. But with appropriate medical therapies one can avoid many tonsillectomies.

Superficial tonsillar swabs are often used to guide medical therapy in acute and recurrent tonsillitis. Positive cultures may have an important role in determining the correct antibiotics. However their use may lead to incorrect conclusions, since several studies indicate marked discrepancy in the external & core tonsillar pathogenic flora. Tonsillar disease may stem from the bacteria within the core of the tonsil, rather than the bacteria identified on its surface.

The present study is undertaken on 50 tonsillectomy cases to determine the utility and correlation between the surface swab culture and tonsillar core.

Materials and Methods
Our study was a prospective study done on 50 patients, who underwent tonsillectomy at S.S. Institute of Medical Sciences and Research Centre, Davangere. All the patients underwent thorough ENT examination. Patients diagnosed with recurrent tonsillitis were included in the study. Patients with acute tonsillitis, bleeding disorders were excluded.

Antibiotics were not given to the patients one week before the surgery. Two-culture swabs from single patient were collected.

Just minutes before the surgery, a tonsillar surface swab was obtained by rotating a sterile cotton wool swab on the surface of the tonsil. Care was taken in not touching other...
part of the pharynx following this, tonsillectomy was performed by the dissection technique. Immediately after the tonsil excision, tonsil was dipped in povidone-iodine solution for 30 seconds, later it was rinsed in sterile saline solution and sectioned into two pieces under strict aseptic condition. With the help of a sterile swab, another swab was taken from the core of the tonsils taking care without touching the tonsillar outer surface.

Above two swabs were then transferred to Microbiology laboratory where the swabs were plated on 5% sheep blood agar, Chocolate agar and in Robertson's cooked meat media. The plates were incubated at 37°C in presence of 10% CO₂ for 24 to 48 hours. Subculture from Robertson's cooked meat medium was done subsequently. Identification of the organisms were accomplished by using standard methods.

Results:
A total of 50 patients aged between 5-30 yrs were included in the study. Overall there was a male predominance. The indication for tonsillectomy was ascertained from history & physical examination findings. Acute recurrent tonsillitis with more than two episodes of tonsillitis from two or more consecutive years was one indication for tonsillectomy in all cases. Their age ranged between 5 to 30 years with male to female ratio 1:1.5

Staphylococcus aureus was the commonest organism isolated from both core and surface of tonsil (Table I). In 10% of the cases no organisms were isolated. The reason for this may be due to the viral etiology. From the core, 74% of pathogenic bacteria were isolated compared to 48% from the surface swab cultures. Discrepancy & variance rate of the bacteria from the surface & the core culture in our study is 59% & 41% respectively. In a similar study by Kurien et al, variance was 48% between core & surface cultures. In a study by Surrow et al, the discrepancy was 64%.

Isolation of normal flora from the surface swab cultures in our study was significantly higher. This may illustrate the basic problem using the results of surface culture for treatment & poor response to medical therapy in Acute recurrent tonsillitis.

Determination of the core bacteriology is important for several reasons. Failure to eradicate pathogens in core whether it is from inappropriate antibiotic choice or from insufficient penetration into the core, will allow persistence of core infection or reinoculation of initially sterilized surface, leading to recurrent tonsillitis.

In conclusion, our results clearly demonstrate that unlike superficial tonsil swab, tonsillar core cultures gives a representative picture of bacterial content in patients with acute recurrent tonsillitis.

Table 1: Bacteria isolated from Core & surface culture

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Surface</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>-</td>
<td>34</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
The study indicates that the routine surface culture obtained from the tonsil do not always predict the pathogenic bacterial flora of the core of the tonsil. There is also a limitation of this swab culture in that organism like *Streptococcus pyogenes* are likely to be missed & more chances of isolating normal flora. An alternative method of collecting the core cultures from the tonsillitis patients like fine needle aspiration of the sample under anesthesia have to be evaluated.

**References:**


**How to Cite this article:**


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**Chi-Square Test**

The chi-square test allows us to test hypotheses using nominal or categorical data (i.e., classifications or categories). What chi-square does is test whether one set of proportions is different from another by comparing frequencies. It gives an estimate on the agreement between a set of observed data and a random set of data that expects the measurements to fit. Since the observed values are continuous, the data must be broken down into bins that each contain some observed data. Bins can be chosen to have some sort of natural separation in the data. If none of these divisions exist, then the intervals can be chosen to be equally sized or some other criteria.

The calculated chi square value can then be correlated to a probability using excel or published charts. If this probability is greater than 0.05, the null hypothesis is true and the observed data is not significantly different than the random.