

COMPARISON OF MICROBIOTA IN CHILDREN WITH RECURRENT TONSILLITIS AND ASYMPTOMATIC CHILDREN- A PILOT STUDY

ABSTRACT

Key words: tonsillitis, commensal, biofilm, *alpha hemolytic streptococci*, probiotics

BACKGROUND

Tonsillitis is a common disease in children of pre-school and primary school group.

Acute episode of tonsillitis can progress to recurrent tonsillitis. The micro-organisms

cultured from children of recurrent tonsillitis and symptomatic children might be

different. There is dynamic interaction between commensal and pathogenic organisms in

upper respiratory tract. It is assumed that asymptomatic children has less commensal

flora compared to children with recurrent tonsillitis. The high percentage of biofilm

identification in children with chronic tonsillitis led to hypothesis that biofilm is

responsible of repeated infection.

There is no clear data available on the microbiological profile in children with recurrent

tonsillitis and asymptomatic children. Our study was aimed to understand the

microbiological flora in two groups-both aerobic and anaerobic, the amount of

commensals in two groups, and biofilm capacity in case of recurrent tonsillitis.

AIMS AND OBJECTIVES

Aim

The aim of the study is to compare the microbiological profile of the throat, in children less than 14 years, with or without throat infection.

Objectives

The objectives of the study are:

1. Describe the microbiological profile of throat in children with recurrent throat infection and children who are asymptomatic.
2. To quantify the commensal flora in the two groups.
3. To determine the biofilm forming capacity of the symptomatic group.

STUDY DESIGN

Observation prospective study

MATERIALS AND METHODS

All children (age <14 years) coming to ENT department with history of recurrent tonsillitis(satisfying Paradise et al criteria) and posted for tonsillectomy were taken as study group and children (age <14 years) coming to ENT OPD with ear and nose symptoms without history of tonsillitis were taken as control group.

After taking consent (from parents in case of children <7 years) and assent (from children > 7 years), throat swab were taken by rubbing floq swab (one each) against both tonsils. The throat swab was then taken to microbiological laboratory within two hours of collection. The micro-organisms were cultured and isolated from aerobic and anaerobic media. Furthur, the biofilm forming capacity was evaluated using spectrometry.

RESULTS

Majority of children with recurrent tonsillitis in this study (87.5%) were less than 10 years. The immunological activity of tonsils is greatest between 3- 10 years and later the tonsils starts involuting there by decreasing the episodes of tonsillar infection. Thus the study results are favoring this observation.

There were more boys in this study (65%) as compared to girls with tonsillitis. Most of the articles mention that there is no sex predilection. Both boys and girls have equal chance of getting recurrent tonsillitis.

Though most of the children were from Tamil Nadu, there were also children from north-east states and neighbouring countries of India like Bangladesh.

There is shown to be increased chance of infection in general, in underweight and malnourished children and children from low socio-economic status (80). This study had 35% children who were underweight, though numbers were more in the study group when compared to control group, it was not statistically significant.

In this study, it was observed that potentially pathogenic bacteria were less in control group when compared to study group. The most common micro-organism in both groups was *Alpha hemolytic streptococci* and *Haemophilus parainfluenza*. The most common virulent organism found was *Streptococcus pneumonia* and was found more in study group. Other virulent organism is *Group A beta hemolytic streptococci*, though it is found in both groups, heavy growth is found in children with recurrent tonsillitis. In this study, heavy growth of *H. parainfluenza* was also found in both study and control group.

We also compared anaerobes between study and control group and there was no statistical difference between two groups. However, the most common anaerobe isolated from this study in both study and control group is *Peptostreptococcus magnus*.

Apart from finding micro-organisms we also made semi-quantitative estimates of cultural growth, since high counts are more likely to be related to pathogenicity than small numbers, which may merely represent healthy carriers.

There was trend of more commensal growth in asymptomatic group. But a clear finding was the heavy growth of alpha- *hemolytic streptococci* in asymptomatic group when compared to the recurrent tonsillitis group.

We also isolated *Methicillin resistant Staphylococcus aureus* (MRSA) in three children with recurrent tonsillitis. Though, MRSA is not a pathogen for tonsillitis. But the presence of MRSA in the tonsils acts as carrier and causes spread of the organisms to other individuals.

In this study, 20 isolates were retrieved from the 13 patients in study group, with biofilm formation in four isolates (20%). These four isolates were recovered from three patients. Strongest biofilm forming capacity was shown by *S. aureus*. There was weak biofilm forming capacity by *P.aeuroginosa* and *Klebsiella* spp.

We also compared the microbes from surface and tonsillar core. The same isolates were found in both throat swab and tonsillar tissue in 60% in aerobes and 47.5% of anaerobes.

Conclusion

The micribiological profile of oropharynx in children with recurrent tonsillitis has its relevance due to factors like, bacterial interference and antibiotic resistance. This study was done to compare the microbiological profile of children with recurrent tonsillitis and asymptomatic children.

In comparison, there was a trend of more heavy growth of commensal in the asymptomatic group as compared to symptomatic group. Though when analysed statistically, there was no significant difference in the profile of the microorganisms in two groups. Being a pilot study, it was concluded that a further study with larger sample size will be required to confirm the observation. It was interesting to note that, there was statistically significant increase the heavy growth of alpha- hemolytic streptococci, which is a commensal in the asymptomatic group as compared to symptomatic group. It was also observed that the amount of potentially pathogenic bacteria in the asymptomatic group less compared to tonsillitis group.

In summary this pilot study showed some interesting observations with regard to microbiota of the throat which is worth exploring using a study with larger sample size.