

Current Trends of Surface Versus Core Bacterial Flora among Recurrent Tonsillitis Patients in a North Indian Tertiary Care Hospital

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ABSTRACT

Introduction: Recurrent tonsillitis is a major cause of morbidity and may require surgical intervention when medical treatment has failed. Reasons suggested for treatment failure include the use of inappropriate antibiotics aimed at pathogens present on the tonsil surface rather than those present in the tonsil core.

Material and Methods: A total of 60 cases of chronic and recurrent tonsillitis which were not responding to medical treatment and are fit and willing for surgery were included in the study.

Results: The culture results of tonsillar surface and core tissue revealed that the majority of samples showed pathogens. Out of 120 cultures of tonsillar tissue, 14 results showed the growth of commensal flora. Single pathogen was isolated from 86 samples from surface and core of the tonsil. However, 14 cultures of core tissue revealed growth of two pathogens as compared to 6 cultures from the tonsillar surface.

Conclusion: Staphylococcus is the most common pathogen isolated from the tonsillar surface as well as core followed by GABHS

Keywords: Recurrent Tonsillitis, Bacterial Flora.

cultures may have very important role in identifying the correct antibiotics. However their use may lead to incorrect conclusions, since several studies indicate marked discrepancy in the external and 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. By appropriate medical therapies we can avoid many tonsillectomies.

The objective of this study was to determine and compare the bacterial flora of the core and surface of the tonsils.

MATERIAL AND METHODS

A cross-sectional prospective study was carried out in the Dept of ENT from a period of October 2014 to april 2016 at JNMCH Aligarh muslim university. A total of 60 cases of chronic and recurrent tonsillitis which were not responding to medical treatment and are fit and willing for surgery were included in the study. The patients of acute tonsillitis, immunocompromise patients and those with suspected malignancy were excluded from the study. Those patients who were on antimicrobial therapy for atleast one week prior to surgery, were also excluded from the study.

A detailed otorhinolaryngological and general physical examination, investigations including complete blood count, bleeding time, clotting time, HIV, HBsAg, renal function test and urine routine examination were done for all patients prior to surgery.

Preoperatively tonsillar surface swabs were taken and due care was taken for not touching the part of the pharynx. Tonsillectomy was performed by dissection and snare method. After tonsillectomy, excised tonsil was cut into two halves under strict aseptic conditions and a sterile swab was rubbed on the cut surface of the tonsil by avoiding touching the margin and outer surface of the tonsil. In the laboratory all swabs were inoculated on 5% sheep blood agar, chocolate

INTRODUCTION

Recurrent tonsillitis is one of the most common diseases of the childhood. These children are prescribed various antimicrobial treatments but the treatments are usually insufficient and surgery is required in most of the cases. Tonsil surface swabs which are commonly used in recurrent tonsillitis do not tell us about the real pathogens so that the antibiotics selected according to the surface swabs are inappropriate.^{1,2,3}

Microorganisms Group A Beta hemolytic Streptococcus may also be the cause of chronic tonsillitis especially in recent years the domination of the beta lactamase producing bacteria (BPLB) such as Staphylococcus aureus and Hemophilus influenza in microflora cause penicillin resistance.⁴ Several researchers have claimed that the failure of antibiotic therapy may be due to the underestimation of resistant microorganisms.⁵

Tonsillectomy and adenoidectomy done because of recurrent infection or obstruction are amongst the most frequently performed childhood operations.

Tonsils and adenoids which play a protective role against infections in healthy individuals may become a reservoir for pathogenic microorganisms in case of chronic infections.⁶ Superficial tonsillar swabs are most often used to guide medical therapy in acute and recurrent tonsillitis. Positive

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Result	Surface	Core	Total
Mixed commensal flora	10	04	14
Single Pathogen grown	44	21	86
Two pathogens grown	06	14	20

Table-1: Culture Results of Tonsillar surface and Core tissue:

Organisms	Surface Total Number(%)	Core Total Number (%)
Staphylococcus aureus	28(50%)	44(62.86%)
GABHS	18(32.14%)	18(25.71%)
Streptococcus pneumoniae	0	4(5.71%)
Hemophilus influenzae	0	4(5.71%)
E.coli	4(7.14%)	0
Klebsiella pneumoniae	4(7.14%)	0
Pseudomonas aeruginosa	2(3.57%)	0
	Total = 56	Total = 70

Table-2: Distribution of total pathogens in surface and core tissue of tonsil:

Tonsillar Surface	Tonsillar Core Tissue	Number of Cases
Normal Flora	Normal Flora	2(3.33%)
Normal Flora	Pathogen	8(13.33%)
Pathogen	Same Pathogen	18(30%)
Pathogen	Different Pathogen	30(50%)
Pathogen	Normal Flora	2(3.33%)

Table-3: Distribution of pathogenic isolates from surface and core tissue:

agar and MacConkey agar medium and incubated at 37 degree Centigrade for 24-48 hours in the presence of 5-10% CO₂ by using candle jar. After appropriate incubation, the isolates were identified and confirmed by standard microbiological techniques.⁷

RESULTS

The culture results of tonsillar surface and core tissue revealed that the majority of samples showed pathogens. Out of 120 cultures of tonsillar tissue, 14 results showed the growth of commensal flora (table-1).

Single pathogen was isolated from 86 samples from surface and core of the tonsil. However, 14 cultures of core tissue revealed growth of two pathogens as compared to 6 cultures from the tonsillar surface.

Staphylococcus is the commonest pathogen isolated from the surface(50%)and from core (62.86%) followed by GABHS isolated from surface (32.14) and from core (25.71%) (table-2).

In the present study, in 18 cases, the same pathogen was isolated from surface as well as core. In majority of cases, 30, different pathogens were isolated from the surface and core. In 8 cases when normal flora was isolated from surface, the core organism was found to be normal flora. In 2 cases, normal flora was isolated from the surface as well as core (table-3).

DISCUSSION

Tonsils are the components of the immune system and their

infections are one of the most frequently involved diseases in humans, especially in childhood. Many factors are responsible and for repeated inflammation of tonsils leading to recurrent tonsillitis.

The probable cause of recurrence in chronic tonsillitis are penicillin resistance due to the variations of the oropharyngeal flora, nonspecific antimicrobial treatments, incomplete course of antimicrobials, pre-infections from the environment, suppression of the antibody response due to the previous inappropriate antibiotic therapies.⁸

In our study, out of 60 cases, males dominated(60%), over females(40%). Majority of the patients were in the age group of 6-10 years(36.7%) and 16.67% in the 21-25 age group. Only few patients were below the age of 5 and above 25 years. The youngest case was 4 years of age and the oldest was 30 years of age. Most common symptom was pain in throat (83.33%), followed by irritation in throat(66.67%) followed by swelling in neck (56.67%) and pain during swallowing(40%). The tonsil enlargement was the most common sign(100%) followed by Jugulodigastric lymphadenopathy(50%) and anterior pillar congestion (36.67%). Paradise et al has similar observation as ours.⁹ Cable et al found no correlation between size of tonsils and indication for tonsillectomy.¹⁰

A total number of 126 pathogenic isolates were obtained from 60cases studied in this study. Staphylococcus aureus was the most common isolate (57.14%) followed by GABHS (28.57%). Out of the 126 pathogenic isolates 112(88.89%) were Gram positive (S. Aureus, GABHS, S. pneumoniae) and 14 (11.11%) were Gram negative (H. influenza, E. coli, Klebsiella, Pseudomonas). These findings are comparable to finding of Gul M et al¹, Abdulrahman et al and Surow et al.¹⁰ Staphylococcus was the most common isolate in both surface and core flora. There are also contrary studies in which no qualitative differences are found between tonsil surface and core flora.

Mallya and Bindu found the largest group of isolates in which surface and core pathogens were the same.¹¹ Studies by Brook et al and Rosen et al^{12,13} have concluded that determination of the surface flora is not useful in predicting core bacteria.

CONCLUSION

In conclusion the culture obtained from the tonsillar surface do not always represent the flora of the core of the tonsil. Staphylococcus is the most common pathogen isolated from the tonsillar surface as well as core followed by GABHS.

REFERENCES

1. Gul M, Okur E, Ciragil P, Yildirim I, Aral M, Akic Kilic M, The comparison of tonsillar surface and core cultures in recurrent tonsillitis. Am J Otolaryngol 2007; 28:173-176
2. Loganathan A, Arumainathan UD, Raman R. Comparative study of bacteriology in recurrent tonsillitis among children and adults. Singapore Med J 2006; 47:271-275
3. Brook I. Failure of penicillin to eradicate group A

- betahemolytic streptococci tonsillitis: causes and management. *J Otolaryngol* 2001; 30:324–329
4. Brook I. The role of anaerobic bacteria in tonsillitis. *Int J Pediatr Otorhinolaryngol* 2005;69:9-19.
 5. Inci E, Karakullukcu B, Aygun G, et al. Fine-needle aspiration as a diagnostic tool for recurrent tonsillitis. *J Int Med Res* 2003;31:307-11.
 6. Uppal K, Bais AS. Tonsillar enigma—the correct modality of treatment. *Indian J Otolaryngol Head Neck Surg* 1989;41:75-8.
 7. Collee JG, Fraser AG, Marmion BP, Simmons A. Mackie & McCartney Practical Medical Microbiology. 14th ed. Churchill Livingstone; New York; 1996
 8. Ozek O, Eğılmez S, Ang O, Savaş I. A bacteriologic study of chronic tonsillitis. *Acta Otolaryngol* 1967;63:455-61.
 9. Paradise JL, Bluestone CD, Bachman R, et al. Efficacy of tonsillectomy for recurrent throat infection in severely affected children. *N Engl J Med*. 1984;310:674-83.
 10. Cable HR, Batch AG, Stevans DJ. The relevance of physical signs in recurrent tonsillitis in children. *J Laryngol Otol*. 1986;100:1047-51
 11. Mallya PS, Abraham B. Clinico microbiological evaluation of surface and core microflora in chronic tonsillitis. *Indian J Otolaryngol Head Neck Surg* 1998;50:281-3.
 12. Brook I, Yocum P, Shah K. Surface vs core-tonsillar aerobic and anaerobic flora in recurrent tonsillitis. *JAMA* 1980;244:1696-8.
 13. Rosen G, Samuel J, Vered I. Surface tonsillar microflora versus deep tonsillar microflora in recurrent acute tonsillitis. *J Laryngol Otol* 1977;91:911-13.

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