Original article

Bacteriological evaluation of tonsillar surface and tonsillar core micro flora in patients undergoing tonsillectomy

S Manandhar[1], S Bhandary[1], S T Chettri[1] B Khanal[2], S P Shah[1], B P Sah[1], D Paudel[1]
[1]Department of Otolaryngology and Head and Neck Surgery and [2]Department of Microbiology
B.P. Koirala Institute of Health Sciences, Dharan.

Abstract

Background: Acute tonsillitis is the most common disease for the ENT surgeons. Effective treatment of the tonsillitis depends on knowledge of the infecting organism but there is always a dilemma whether the antibiotics prescribed for the tonsillitis is sufficient for the different organisms in the surface and core of the tonsils. **Objective:** To study the microorganism on the surface and in the core of the tonsil among the patients undergoing tonsillectomy and to correlate clinical profile of the patients with various microorganisms isolated. **Methods:** This was a cross sectional study conducted on fifty patients' age ranging from 3 years to 45 years. The swabs obtained from the surface of the tonsil prior to tonsillectomy and core of the tonsil post tonsillectomy were sent for isolation of micro organism and microbial susceptibility technique by standard microbial method. **Results:** The common age group for tonsillitis was below 15 years (n= 26) and having male predominance and more common in patients from hilly region. The commonest indication for tonsillectomy was recurrent tonsillitis (n=47).There was 82% similarity in microorganisms isolated from the surface and core of the culture. **Conclusion**: This study highlights that the culture from the surface of the tonsil reflects the organism in the core. Staphylococcus aureus was the commonest isolated organism in the surface and core of the tonsil.

Keywords: core, recurrent tonsillitis, surface, tonsillectomy

Introduction

Tonsillitis is an inflammation of the tonsils. There are different variations of tonsillitis: acute, sub acute, chronic and recurrent.[1] Acute tonsillitis is the most common disease for the ENT surgeons, pediatricians and general practioner encountered in their daily practice. There is no convincing evidence of benefit that specific antibiotic is effective in aborting recurrent attacks of tonsillitis. The medical treatment of recurrent tonsillitis remains an elusive goal.

Address for correspondence
Dr. Sriti Manandhar
Assistant Professor, Otolaryngology and Head and Neck Surgery.
B.P. Koirala Institute of Health Sciences, Dharan.
Email: sriticha@gmail.com

Group A β haemolytic streptococcus is commonly found but this does not conclusively prove that the organism is causative. The incidence of a positive culture may be as high as forty percent in asymptomatic carriers. The present study aimed to study the microorganism on the surface and in the core of the tonsil among the patients undergoing tonsillectomy and to correlate the clinical profile of the patients with various microorganisms isolated.

Methods

This was a descriptive cross sectional study done in fifty patients with age ranging from three years to 45 years undergoing tonsillectomy in the department of Otolaryngology and Head & Neck Surgery and Department of Microbiology in B.P. Koirala Institute of Health Sciences, Dharan from January 2010 to January 2011.

Complete history was taken and clinical examination was done in patients who fulfilled the inclusion criteria in the OPD. Size of the tonsil grading was done by 4-point scale.[2,3] Under full aseptic precaution, a tonsillar surface swab was obtained from the tonsil which was more affected by rotating a sterile cotton wool swab sticks over the surface of the tonsil not touching other parts of oropharynx. Three swab sticks were rubbed to the surface of tonsil. No antibiotics were prescribed one week prior to tonsillectomy and no antiseptic gargle was used preoperatively and intra operatively prior to tonsillectomy. Patient was laid supine on operating room table then general anesthesia was induced followed by intubation. Bolye Devis mouth gag was introduced and opened and held in place by Draffon's bipods. Tonsils were exposed. Tonsillectomy was done by appropriate technique.[4] After removal of the tonsil, it was dipped in povidone iodine for 30 s then tonsils were rinsed in sterile saline solution.[5] Under full aseptic precaution tonsil was sectioned into two pieces, cotton swab sticks were rubbed to the surface of excised tonsils avoiding its outer surface**.** First swab stick was used for smear and gram staining. A second swab stick was inoculated in blood agar, chocolate agar and McConkey media and was incubated at 37^0 C with 5-10% CO_2 for 24-48 h. Third swab material was kept in Brain heart infusion broth, which was incubated for 18-24 h and subsequently sub cultured in blood agar, chocolate agar and McConkey agar.

The same method was used with the swab sticks from the core of the tonsil. Incubation of the culture media, isolation and identification of the microorganisms and antimicrobial susceptibility testing was done by standard microbiological methods.[6, 7]

Clinical profiles of the patient were compared with the organism isolated, age of the patient, sex of the patient, severity of signs and symptoms, frequency of attack, size of the tonsil, seasonal variation and frequency of tonsillitis.

Results

Overall there was slightly male predominance with male to female ratio of 1.17:1. The indication for tonsillectomy was decided according to the history and complete physical examination. Forty seven patients (94%) underwent tonsillectomy for recurrent tonsillitis (RT) whereas only three (6%) had adenotonsillectomy for chronic adenotonsillitis (AT). The commonest mode of presentation was odynophagia (98%). Forty-six patients had history of fever. One patient had complain of difficulty in respiration. All the patients had history of missing job or school due to recurrent attack of tonsillitis. We observed that maximum number of patients presented with 3 years duration of illness accounting 38% followed by 4 years, 2 years, 5 years, 6 years and 1 year. The tonsillar size grading was: grade III tonsils in 36(72%) patients, grade II in 12 (24%) patients and grade IV tonsil in 2 (4%) patients. Grade III tonsil was common in younger age group. The tonsil size did not show any relation with the number of recurrent attacks of tonsillitis.

Table 1: Microorganism isolated from the surface and core culture of the tonsil in relation to grade of tonsil

S.N	Organism	Grade	Surface	Core
1	Staphylococcus aureus(SA)	III	14	16
		II	2	3
		IV	1	1
2	*Pseudomonas aeruginosa(PA)*	III	8	6
		II	2	3
3	*Streptococcus pneumonia(SP)*	III	7	6
		II	5	4
4	*Streptococcus viridians(SV)*	III	7	6
		IV	0	1
5	*Klebseilla pneumonia(KP)*	III	2	0
		II	2	3
6	*Acinetobacter species(AB)*	III	1	1
		II	1	0
7	*Citrobacter species(CB)*	III	2	1
8	*Enterococcus species(EC)*	III	2	3
		II	1	3
9	*Enterobacter species(EB)*	II	1	2
10	*Escherichia coli(ECO)*	II	1	1

Staphylococcus aureus was the commonest isolate in grade III tonsil.

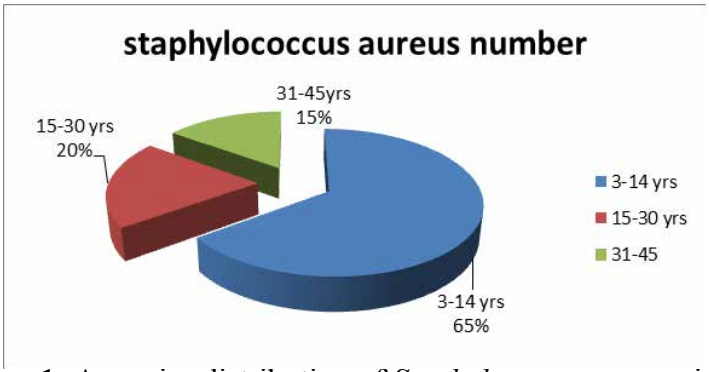

Figure 1: Age wise distribution of *Staphylococcus aureus* isolates

Table 2: Season wise distribution of organism isolated from core tissue of tonsil

SN	Mth (months)	Total pts	SA	SP	SV	PA	KP	EC	EB	CB	ECO	AB
1	Feb-May	15	4	2	-	4	3	-	2	-	1	-
2	Jun-Sep	14	7	4	5	1	-	2	-	-	-	-
3	Oct-Jan	21	9	4	2	4	-	1	-	1	-	1

Numbers of patient presented in the month of October–January was the highest. *Staphylococcus aureus* was the commonest isolate.

Table 3: Sex wise distribution of tonsillar size grading

Sex	Gr. II	Gr.III	Gr. IV	Total
F	9	14		**23**
M	3	22	2	**27**
Total	12	36	2	**50**

The micro-organisms isolated from the surface and the core culture match in 82 % cases with only 18% having different micro flora.

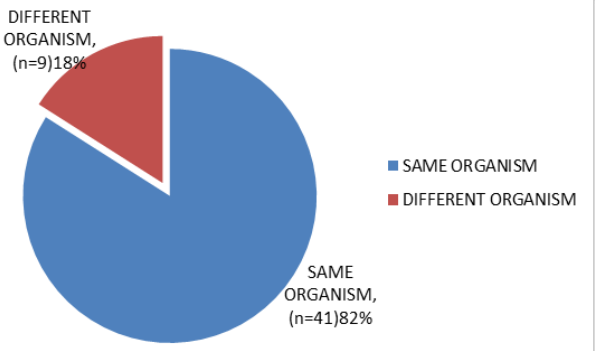

Fig: 3: Matching of isolates from the surface and core of tonsils.

Discussion

Tonsillectomy is a common operation in otolaryngology and head and neck surgery. The criteria for offering tonsillectomy have changed significantly over the years. A recent study showed that the main indications were obstructed breathing of any type in 59% of cases, recurrent infections in 42%, and obstructive sleep apnea in 39%.[8] In the present study the commonest indication was recurrent tonsillitis which is comparable with the findings of the studies done by Paradise et al[9] and Abhay et al[5]. We found *Staphylococcus aureus* the commonest organism isolated in the surface and core of the tonsil which is comparable with the finding of Ozek et al[10].

However Rosen et al[11] reported *H influenza* (40%) the common isolate in the core tonsil whereas Brooke et al. [15] found haemolytic streptococci the predominate isolate.

In correlation of tonsillar size and micro organism isolated, the present study showed grade III tonsil with *Staphylococcus aureus* the commonest isolate in both surface and core culture. However Brodesky and coworker[2] showed *H influenza* had a significant positive correlation to tonsil weight.

Study done by various author like Kurien et al[12], Timon et al[13],Surow et al[14] ,Brook et al[15] and Rosen et al[16] noted discrepancy in the isolates of surface and core. However our series of study showed 82% similarity in both surface and core culture which was statistically significant. Almadori et al[17] stated that surface swab cultures did reflect organisms present in the core. Similarly Mallya and Bindu[18] found the largest group of isolates in which surface and core pathogens were the same. Microbiological study of both surface and core of the tonsils in the current study revealed that *Staphylococcus aureus* was the commonest isolate. This was in agreement with the finding of Surow et al[14], Endo et al[19] and Yildirim et al[20]. Evidence indicates that the clinical diagnosis alone carries sensitivity and specificity of only between 20 and 50 percent.[21]

Conclusion

This study highlighted the culture from the surface tonsil reflects the organism in the core. *Staphylococcus aureus* was the commonest isolated organism in surface and core of tonsil. Similar micro-organism in the surface and core were found in 82% of isolates with discrepancy of just 18 %.

Hence this study suggests that antibiotics can be prescribed according to their microbial susceptibility of isolated micro-organism from the tonsillar surface.

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