

Tonsillar Surface Micro Flora: Does it Truly Represent Pathological Tonsillar Flora?

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ABSTRACT

Objective: To determine the best method of identifying core tonsillar flora.

Study Design: Quasi-experimental study.

Place and Duration of Study: ENT Department, Combined Military Hospital, Lahore, from September 2013 to October 2015.

Methodology: Eighty-seven patients of recurrent tonsillitis undergoing tonsillectomy were included. All the patients, after being anaesthetised, had surface swabs taken from the tonsillar surface followed by tonsillar aspiration with a 5cc syringe. Following tonsillectomy, the tonsils were sent for culture of core flora. All three specimens from each patient were cultured according to established criteria.

Results: The patient population had 33 (37%) female and 54 (62%) male patients. Flora of 12 (13.8%) surface swabs and 68 (78.2%) tonsillar aspirates matched the flora cultured from core of the tonsils. Chi-square test showed this difference to be significant (p-value <0.001).

Conclusion: Tonsillar aspiration gave a much more realistic picture of the tonsillar core flora as compared to surface swabs.

Key Words: Core flora. Tonsillectomy. Surface swab. Tonsillar aspiration.

INTRODUCTION

Tonsillectomy due to recurrent tonsillar infections is one of the most commonly performed operation in Otolaryngology Department. About 3,605 tonsillectomies were performed in Scotland from 2006 to 2007 for bacterial tonsillitis.¹ The outcome of tonsillectomy in terms of parental satisfaction carries a rate of over 90%.²

Recurrence of tonsillar infections is attributed to a variety of factors including low immunity, anatomical variation, chronic adenoid hypertrophy, sinusitis etc. The recurrence of tonsillar infections lead both surgeon and patient to opt for surgical treatment. Whether this surgical treatment is at all necessary is debatable, because if the recurrence can be stopped by adequate antimicrobial coverage then the need for tonsillectomy can be alleviated.³ Currently, the practice in vogue for the choice of antimicrobial therapy is based on the surface flora of tonsil, extracted from the tonsillar surface. The surface flora may not be the true representative of tonsillar core flora. Uppal *et al.* showed that there was no correlation between the flora of bacteria cultured from the surface of the tonsil, and that which was cultured from within the tonsillar crypts.⁴

Regarding the tonsillar flora, the most commonly isolated organism on tonsillar surface swab is group A beta-haemolytic *Streptococcus* GABHS shown to present in 5 - 36% of tonsillar infections. Other commonly cultured organisms include *Haemophilus influenza*, *Candida*, *Chlamydia pneumone*, *Mycoplasma pneumone*, *Neisseria meningitides* and *Neisseria gonorrhoeae*.⁵ GABHS has also been reported in cases of rheumatic fever secondary to recurrent attacks of tonsillitis. Despite the overwhelming evidence of involvement of GABHS in the disease process of tonsillitis, an asymptomatic carrier rate up to 40% has been mentioned for GABHS in the literature.⁶ Findings like this compel researchers to dwell on the fact that flora isolated from the tonsillar surface may not be the true representative pathogen.

Furthermore, bacterial flora within the tonsillar crypts and core of tonsil appear more likely to be causing the infections. So, the reasoning that the antimicrobial therapy targeted at tonsillar surface flora is not a sound treatment is gaining ground. Surface swabs are no more recommended according to National Health Service (NHS) guidelines.¹

The objective of the study was to determine the best method of identifying core tonsillar flora.

METHODOLOGY

The study was designed to detect the common pathogens in core sample of tonsil, with the correlation that the same flora be isolated from surface swab and aspiration of the tonsil. This study included 87 patients undergoing tonsillectomy at Combined Military Hospital, Lahore, from September 2013 to October 2015. All the

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patients had only one indication for tonsillectomy, i.e. recurrent tonsillitis (at least three documented attacks of tonsillitis per year for three consecutive years) not settling with antimicrobial therapy. Informed consent was taken from each patient after approval of study from Hospital Research Review Board.

Under general anaesthesia, surface samples were collected from both tonsils, using a sterile cotton swab. After collecting the surface swabs, both tonsils were aspirated at three different points using a 5cc disposable syringe with a 23-gauge needle. Upon removal of both tonsils, they were placed in normal saline and transported to the laboratory along with surface swab and 5cc syringe containing tonsillar core aspirate. All tonsillectomies were done by the same consultant surgeon. Postoperatively all patients were managed with intravenous Ceftriaxone, intravenous Acetaminophen, and oral Ibuprofen for 5 days according to age and body weight. All the patients were advised soft diet for 10 days postoperatively.

The tonsils were cut and swabs were taken from the tonsillar core. Microbial from all 3 specimens were cultured on blood agar for total aerobes count and for group A beta-haemolytic *Streptococcus* (GABHS), Columbia agar was used for *Streptococcus* species, Chocolate agar was employed for *Haemophilus* and *Neisseria*, Robertson cooked meat medium was used for anaerobes' identification. The anaerobe plates were incubated in standard anaerobic conditions at 37°C for 2 days. Colonies were identified using standard technique.

Frequency and percentage was calculated for gender and correction of caudal deviation. Mean ± SD was calculated for quantitative variables like age. The results were generated using chi-square test on SPSS version 16. The p-value of ≤0.05 was taken to be statistically significant.

RESULTS

The study group was composed of 33 (37%) female and 54 (62%) male patients. Their ages varied from 9 to 35 years. Mean age was 18 ±9.59 years. The most common organism cultured was group A beta-haemolytic *Streptococcus* (GABHS), followed by *Staphylococcus aureus*, coagulase negative *Staphylococci* and anaerobes. The most prevalent anaerobic bacteria were *Peptostreptococcus*, *Propionibacterium*, *Bacteroides* and *Fusobacterium* species.

Surface swabs of 87 patients were compared with tonsillar core microflora and only 12 (13.8%) specimens of patients were found to have matched. Whereas, 68 (78.2%) aspiration samples matched with tonsillar core microflora (Table II). Using Chi-square test, it was found that tonsillar aspiration gave a much more realistic picture of the tonsillar core flora as compared to surface swabs (p <0.001).

Table I: Organisms cultured from tonsil.

Case No: _____	Patient Name: _____		
Contact: _____	Date: _____		
Address: _____			
Organism	Surface swab	Tonsillar aspirate	Core sample

P = Present; A = Absent

Table II: Frequencies of aspirates compared with core flora.

	Tonsillar aspirate	Surface swab	p-value
Matched with core flora	68 (78.2%)	12 (13.8%)	<0.0001
Not matched with core flora	19 (21.8%)	75 (86.2%)	
Total	87 (100%)	87 (100%)	

Chi-square test is applied

DISCUSSION

Tonsillitis has been reported since the time of Celcus in the first century, and as a consequence tonsillectomy with or without adenoidectomy remains one of the most commonly performed surgeries in the pediatrics group. Not only are the indications of tonsillectomy controversial, with constant debate on criteria for tonsillectomy, the cost and postoperative complications have generated a lot of debate on efficacy of tonsillectomy.⁸ Literature has been divided for almost a century, debating whether tonsillectomy is of any benefit and can it be prevented with better antimicrobial identification; because evidence-base medicine is questioning the rationale for a surgical procedure linked to repeated infections, and why that infection cannot be treated medically.⁹

Identification of tonsillar flora causing recurrent infections is of paramount importance in treating recurrent infections. Surface swab of the tonsils is now being questioned as a reliable method of pathogen identification.¹⁰ Tonsillar core gives a better yield of anaerobic specimen, which in turn can be used to study and treat bacteremia in post-tonsillectomy cases as well as prevent a case of recurrent tonsillitis to progress to tonsillectomy.¹¹

Core samples of normal tonsils have shown not to harbour any bacteria, as tonsils removed for any conditions other than recurrent tonsillitis have shown no growth of bacteria on cultures.¹² Having positive identification of pathogenic microflora from core samples, it can help identify diseased cases and, microbial count can help identify cases requiring tonsillectomy.¹³ Having established that tonsillar microflora is truly represented by the core specimen,¹⁴ the question remains to find a method to extract this core flora, which is both reproducible and reliable.¹⁵ Scottish Intercollegiate Guidelines in 2010 guidelines have stated that surface swab is a poor representative of tonsillar core flora and cannot form a basis of prescribing antibiotics for

treatment of tonsillitis.¹⁶ The current antibacterial therapy being adopted for recurrent tonsillitis comprises of penicillin group of antibiotics.¹⁷ The anti-microbial spectrum of penicillins does not cover anaerobes, whereas anaerobes have been reported in up to 70% of tonsillar core flora specimens.¹⁸ Tonsillar aspirations provide a reliable method to identify core flora. In outpatient departments, it can easily be done by an otorhinolaryngologist using a 5cc syringe and topical anesthesia in spray bottles much like fine needle aspiration cytology.

CONCLUSION

Identification of tonsillar core flora is of paramount importance in selection of appropriate treatment modality. Tonsillar aspiration gives a more realistic picture of core flora.

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