

Original article:

Study of common bacterial isolates in acute tonsillitis in India

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Abstract:

Introduction: Tonsillitis is a common condition encountered in the ENT out-patient department of every hospital. 1 out of every 10 children visiting the ENT OPD, suffer from acute tonsillitis.

Materials and methods: Our prospective observational study was carried out in the otorhinolaryngology department in a Medical College Hospital and Research Centre. The period of study was from June 2015 to August 2015. Randomized throat swabs were collected from 50 patients visiting the ENT OPD. A certificate of approval of the Institutional Ethics Committee(IEC) was obtained before commencing the study. An informed consent was obtained from every patient who was a part of this study before commencing the study.

Results : Out of the 50 patients from whom the throat swabs were collected and analysed, 45 were positive for Staphylococcus aureus, 3 were positive for Klebsiella pneumonia. Streptococci were isolated from two swab cultures, one of which was positive for Streptococcus pyogenes while the other was positive for beta haemolytic streptococci.

Conclusion: Staphylococcus aureus appears to be the main causative agent in the pathogenesis of acute tonsillitis in our area with a prevalence of about 90%(45/50 positive isolates).

INTRODUCTION:

Tonsillitis is a common condition encountered in the ENT out-patient department of every hospital. 1 out of every 10 children visiting the ENT OPD, suffer from acute tonsillitis. [1] Tonsils are the protective sentinels against harmful intruders in the oropharynx. They are the aggregates of Mucosa associated lymphoid tissue found in the sub-epithelial layer of the pharynx. Organized in the pharynx as the Waldeyer's ring, these tonsils act as the first line of defence against various bacterial and viral infections. Whenever a bacteria or virus is inhaled or ingested, the 'surveillance' mechanism of these tonsils comes into play and they identify the intruder and are therefore, involved in antibody formation.

Acute inflammation of these tonsils, accompanied by pain on swallowing, fever, malaise and throat pain, is known as acute tonsillitis. Tonsillitis occurs when the trapped organisms penetrate the mucosal barrier and attach themselves to the epithelial cells, leading to cytokine production and complement activation. These events induce an inflammatory reaction in the tonsillar mucosa. [2]

Pathogenesis of acute tonsillitis is mainly attributed to intrusion of viruses and bacteria. Bacteria that are known to cause acute tonsillitis include Staphylococci and beta haemolytic Streptococci. [3] Other pathogens involved in acute tonsillitis may be Group A beta haemolytic Streptococci, Klebsiella pneumoniae, E.coli.

MATERIALS AND METHODS:

Our prospective observational study was carried out in the otorhinolaryngology department in a Medical College Hospital and Research Centre. The period of study was from June 2015 to August 2015. Randomized

throat swabs were collected from 50 patients visiting the ENT OPD. A certificate of approval of the Institutional Ethics Committee(IEC) was obtained before commencing the study. An informed consent was obtained from every patient who was a part of this study before commencing the study.

INCLUSION CRITERIA:

- Patients coming with a history of :
 - Throat pain
 - Pain on swallowing
 - Fever
 - Bodyache and other constitutional symptoms
- Patients with a clinical evidence of acute tonsillitis which includes:
 - Congestion over the anterior pillar
 - Redness of the tonsils
 - Enlarged and tender jugulo-digastric lymph nodes

EXCLUSION CRITERIA:

- Patients with:
 - HIV/Immune compromised patients
 - Diabetes
- Patients on steroid medications
- Patients with a history of chronic granular pharyngitis
- Patient belonging to an age group of more than 50 years.

OBSERVATIONS AND RESULTS:

TABLE 1: PREVALENCE OF BACTERIAL PATHOGENS

BACTERIAL PATHOGEN	NUMBER (OUT OF 50)	PERCENTAGE
METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS	28	56
METHICILLIN SENSITIVE STAPHYLOCOCCUS AUREUS	17	34
STREPTOCOCCUS PYOGENES	1	2
BETA HAEMOLYTIC STREPTOCOCCI	1	2
KLEBSIELLA PNEUMONIAE	3	6

Prevalence of bacterial pathogens:

Out of the 50 patients from whom the throat swabs were collected and analysed, 45 were positive for Staphylococcus aureus, 3 were positive for Klebsiella pneumonia. Streptococci were isolated from two swab cultures, one of which was positive for Streptococcus pyogenes while the other was positive for beta

haemolytic streptococci.

Out of the total 50 swabs collected, Methicillin resistant staphylococcus aureus(MRSA) was isolated in maximum percentage(56%), followed by Methicillin sensitive staphylococcus aureus(MSSA) which was prevalent in 34% of the cases. Klebsiella pneumoniae showed a prevalence of 6% while Streptococcus pyogenes and beta haemolytic streptococci showed a prevalence of 2% each.

DISCUSSION:

In our study, we found that out of the 50 isolates, 45 of them showed positive swab cultures for Staphylococcus aureus. Methicillin resistant Staphylococcus aureus (MRSA) was predominant (56%), followed by Methicillin sensitive staphylococcus aureus(MSSA) which was positive for 34% isolates. Klebsiellapneumoniae was isolated in 6% of the cases while Streptococci showed a prevalence of only 4%. Out of these 4% cases, 2% were of Streptococcus pyogenes while beta haemolytic streptococci showed 2% prevalence. This was similar to the results obtained by Mitchelmore IJ in 2007, who also reported a predominant incidence of Staphylococcus over the Streptococci. [4] However our results were in contrast to those of Sadoh et al who showed 48.72% Streptococcal incidence in 2008.[5] The prevalence of various bacterial pathogens may differ in different areas and acute tonsillitis in our area, may be attributed to Staphylococcus aureus majorly.

Over the years, commonly occurring bacteria have shown various trends in the antibiotic susceptibility pattern. A number of antibiotics have thus become uncommon in treating tonsillitis due to the emerging resistance amongst the bacterial pathogens. An average sensitivity of 30.28% was observed. The highest sensitivity was shown to Vancomycin (100%) followed by Gentamicin(86.6%) and Erythromycin (76%), which was found to be statistically significant ($p < 0.005$). Other commonly used antibiotics like Ampicillin, Amoxicillin however, showed low sensitivity. This finding was not statistically significant ($p > 0.005$). The performance of Cotrimoxazole was also found to be above average with 60% sensitivity results, however, not statistically significant ($p > 0.005$). Both Methicillin resistant as well as Methicillin sensitive Staphylococci showed sensitivity to vancomycin. This was found to be in accordance with the findings of Dechen C Tsering in 2011.[6,7] The high sensitivity of Vancomycin may be due to its mechanism of inhibiting cell wall synthesis by binding to the building blocks of peptidoglycan wall of the bacteria. Also, Vancomycin is the final resort used in case the other antibiotics fail. This may also be a cause of its high sensitivity pattern.

CONCLUSION:

Staphylococcus aureus appears to be the main causative agent in the pathogenesis of acute tonsillitis in our area with a prevalence of about 90%(45/50 positive isolates).

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