

Original Article



Sore Throat and Methicillin Resistant Staphylococcus Aureus Positive Pharyngo-Tonsillitis in a Tertiary Hospital

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Abstract

Background: Antimicrobial resistance in health care-associated pathogens is a growing concern for healthcare and for public health. In response to these concerns, medical experts, professional societies and agencies, such as the Centers for Disease Control and Prevention (CDC), have proposed initiatives to curtail the spread of antimicrobial resistance in pathogenic bacteria. **Objectives:** The purpose of the study was to observe the disease pattern and demographic characteristics of patient attending at the outpatient department of Otolaryngology in a tertiary care hospital suffering from sore throat and methicillin resistant Staphylococcus Aureus (MRSA) positive pharyngo-tonsillitis. **Materials and Methods:** This is a retrospective study carried out at the outpatient department of Otolaryngology in Khwaja Yunus Ali Medical College and Hospital for the period of January, 2016 to December, 2017. Data were collected based on history, clinical examinations and culture and sensitivity report of throat swab of the patients. **Result:** A total of 339 patients were studied of which 49.56% were male and 50.44% were female. The mean age was 30 years; maximum patient (36.28%) belongs to 21-30 years of age. Maximum patient (76%) were come from out of Sirajganj district specially North Bengal. Regarding result of throat swab of C/S 58.11% patients were MRSA positive, 26.84% patients were MRSA negative and 15.04% patients has no growth. **Conclusion:** It is illogical to treat all sore throats with antibiotics. A large scale multi-center study should be performed in the country. A uniform data system should be constructed for Chronic Pharyngo-tonsillitis caused by Methicillin resistant Staphylococcus aureus in Bangladesh.

Keywords: Sore throat and MRSA positive pharyngo-tonsillitis, Otolaryngology, Tertiary hospital.

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Introduction

Normal flora is the term used to describe the various bacteria and fungi that are permanent residents of certain body sites. The normal flora organisms are often referred to as commensals. Commensals are organisms that derive from another host but do not damage the host. There is a distinction between the presence of these organisms and the carrier state. The term carrier implies that an individual harbors a potential pathogen and therefore can be a source of infection of others. There is also a distinction to be made between members of the normal flora, which are the permanent residents, and the colonization of the individual with a new organism. In a sense, we are all colonized by the normal flora organisms, but the term colonization typically refers to the acquisition of a new organism. After the new organism colonizes (i.e., attaches and grows, usually on a mucosal membrane), it may cause an

infectious disease, or it may be eliminated by our host defence.¹ Most important organism is *Viridans streptococci*, and less important organisms are *Streptococcus pyogenes*, *Streptococcus pneumoniae*, *Neisseria species*, *Haemophilus influenzae*, *Staphylococcus epidermidis*.¹

The range of organisms cultured from the tonsils both in health and disease is extremely variable, with recognized differences in bacterial flora retrieved from surface and from core samples^{2,3} The organism most commonly identified from the surface of the tonsil in disease is the group A beta hemolytic streptococci (GABHS). Up to 40 percent of asymptomatic individuals will also have a culture positive for this organism.^{4,5} Other surface organisms include *Haemophilus*, *Staphylococci*, *alpha hemolytic streptococci*, *Branhamella sp.*, *Mycoplasma*, *Chlamydia*, various anaerobes and a variety of respiratory viruses.^{6,7} In a study of core

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samples obtained by fine needle aspiration in health and disease, core samples of normal tonsils usually failed to grow pathogenic organisms.⁸ In recurrent tonsillitis the samples grew a range of pathogens but the predominant organisms were *Haemophilus influenza* and *S. aureus*. Acute inflammatory episodes affecting the tonsils may occur as an isolated episode, or in association with a viral upper respiratory illness including generalized Pharyngitis. Both bacterial and viral tonsillitis tend to resolve quickly without treatment in most cases.^{9,10}

The increasing incidence of Methicillin resistant *Staphylococcus Aureus* infection (MRSA) in ENT disease is becoming a clinical concern. The proportion of patient suffering from chronic pharyngo-tonsillitis caused by methicillin resistant *Staphylococcus Aureus* (MRSA) positive organism has progressively increased during the last few decades and an alarming situation for common antibiotic resistance such as penicillin used in chronic pharyngo-tonsillitis has developed. MRSA is sometimes called a "Super bug" because it does not respond to many antibiotics. Since resistance to multiple antibiotics among MRSA isolates is very common, there is a possibility of extensive out breaks, which may be difficult to control. Early detection of MRSA and formulation of effective antibiotics policy in tertiary care hospital is of paramount importance from the epidemiological points.^{11,12} Therefore determining the trends in antibiotic susceptibility pattern of methicillin-resistant and methicillin-sensitive *Staphylococcus aureus* becomes necessary in the selection of appropriate empirical treatment of infection.

This present study was carried out with intention to provide information about demographic data and disease pattern among the patient suffering from chronic pharyngo-tonsillitis specially not responding to commonly used antibiotics (e.g.: Penicillin, Amoxicillin, Erythromycin etc.) in the outpatient department of Otolaryngology, KYAMCH, Sirajganj.



Figure1: Picture showing Pharynx and Tonsils.

Materials and Methods

The present research work was a descriptive cross sectional study conducted at the department of Otolaryngology in collaboration with Micro-biology Laboratory of Khwaja Yunus Ali Medical College (KYAMCH), Enayetpur, Sirajganj, Bangladesh in during the period of 2016 and 2017. This study comprised 339 clinically diagnosed pharyngo-tonsillitis patients including both sexes of all age group taking medical care at KYAMCH. Throat swab for C/S was collected from the Otolaryngology outpatient department in clean, sterile and dry containers. The sample were taken to the laboratory and processed within 4 hours. The specimens were cultured on blood agar and Mac. Conkey's agar plates and incubated aerobically at 37°C for 48 hours. After the antibiotic sensitivity testing of each *Staphylococcal* isolates, the organisms were screened for MRSA. The MRSA strained were identified by testing with Cefoxitin disk having zone of inhibition less than 21 mm. The isolates were distinguished as MRSA and MSSA respectively by ODDM (Oxacillin disk diffusion method). Strict aseptic conditions were maintained when carrying out all the procedures (Figure 2 and 3).

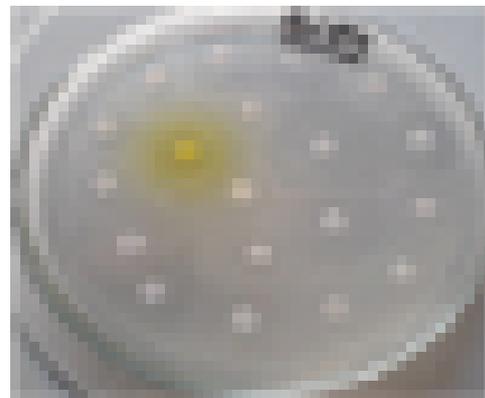


Figure 2: Sensitivity Disc.

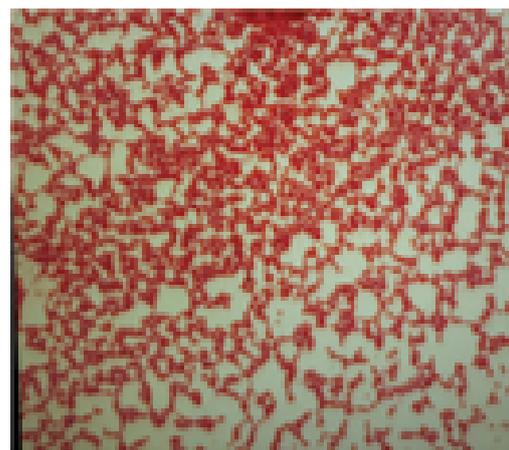


Figure 3: Gram staining for detection of gram positive cocci.

Results

Total numbers of patients are 339. Among them 168 (49.56%) were male and 171 (50.44%) were female (Figure 4). Maximum of the patients (36.28%) belong to 21- 30 years of age (Figure 5). Majority of the patients (76%) were from outside of Sirajganj district. Rest of the patients were from Sirajganj district (Figure 6). Among the total number of patients, 39% were house wives, 28% were service holders, 9% were farmers, 7% businessmen, 4% were students and 6% were teachers (Figure 7). Regarding result of throat swab of C/S 197 (58.11%) patients were MRSA positive, 91 (26.84%) patients were MRSA negative and 51 (15.04%) patients has no growth (Figure 8). Among those patients, 39% patients took inadequate dose of antibiotics, 27% patients took antibiotics for improper duration and 13% took wrong antibiotics. Rest of the patients had no problem in taking appropriate antibiotic for proper dose and duration (Figure 9).

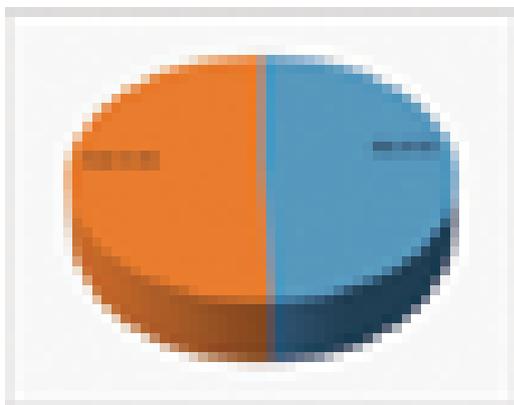


Figure 4: Pie diagram showing Gender ratio.



Figure 5: Age distributions of the study subjects.

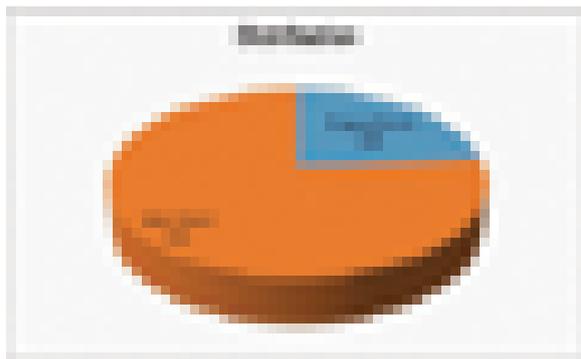


Figure 6: Locality

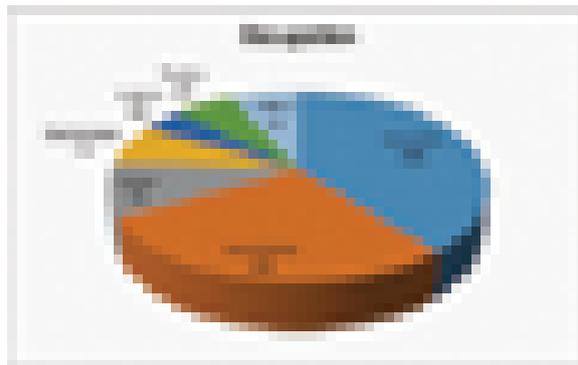


Figure 7: Pie diagram showing Occupations of the study subjects.

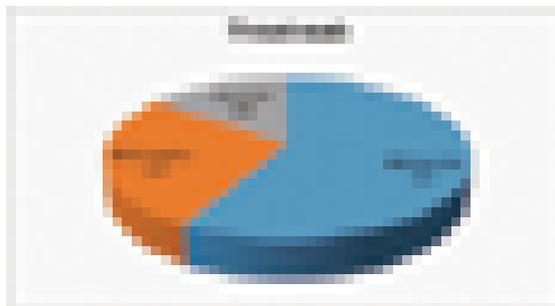


Figure 8: Pie diagram showing culture and sensitivity result for throat swab.

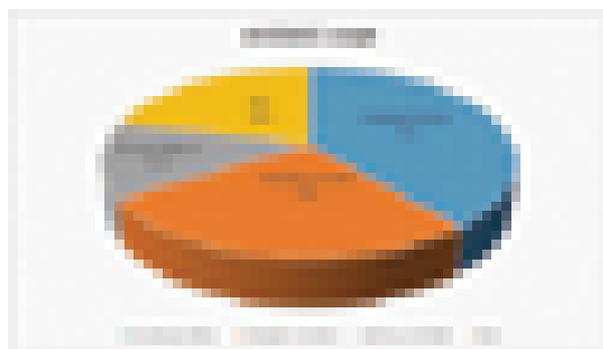


Figure 9: Antibiotics uses.

Discussion

In this study, 58.11% were MRSA positive patients, 26.84% were MRSA negative patients and 15.04% had no growth. Among those patients, 39% patients took inadequate dose of antibiotics, 27% patients took antibiotics for improper duration and 13% took wrong antibiotics. Rest of the patients had no problem in taking appropriate antibiotic for proper dose and duration. A Cochrane review of antibiotic of sore throat found a reduction in the frequency of supportive complications including quinsy (OR 0.16; 95 percent CI 0.07-0.35), but concluded that 'blanket' or routine prescription of antimicrobials was not justified.¹¹ There is evidence that patients prescribed antibiotics for sore throat are more likely to re-attend for antibiotic prescription on subsequent occasions¹² and the risks of wide spread indiscriminate antibiotic prescription include genesis of resistant organisms, allergy and anaphylaxis.¹³ In the UK, the significance of the presence of bacterial pathogens in cases of sore throat remains in doubt.^{14,15} This may be due to the lack of awareness about the indiscriminate use of broad spectrum antibiotics. It is observed that these patients had tendency to take antibiotic with the suggestion of quack and from local Pharmacy without any advice of a registered practitioner. In Khawaja Yunus Ali Medical College and Hospital the referral system and interaction among different departments is improving gradually and importance of Otolaryngology department is being appreciated. The total number of patients attending in the Otolaryngology outpatient department have been increasing day by day. Most of the patients come in this department from different areas of North Bengal. Moreover, referral patients are also seen from different department's specially Medicine, Pediatrics, Surgery, Urology, Cardiology and Gynecology department. Subsequently, these patients come and have follow up treatment and management according to culture sensitivity report and surgery to improve quality of life. This study is done in one tertiary care hospital of Bangladesh in a small population and it may not reflect the total scenario of patient suffering from MRSA positive organism getting treatment from Otolaryngology department. A uniform data system for MRSA positive is maintained in USA and published annually. No such system exists in

Bangladesh. Current study is based on MRSA causing PT. Plennse discuss your study findings or focus related (recent) previous study.

Haemophilus influenzae, *Staphylococcus aureus*, and *Streptococcus pyogenes* were the predominant species isolated from both peritonsillar abscess (PTA) and recurrent tonsillitis (RT).¹⁶ *S. aureus* was the predominant species (57.7%) in RT patients, whereas *Streptococcus pyogenes* was most prevalent (20.2%) in PTA patients.¹⁷ From the above discussion it is clearly demonstrated that the finding of the study performed in the Otolaryngology outpatient department of KYAMCH is consistent with the findings of different institute of Bangladesh.

Conclusion

Though *Staphylococcus aureus* previously is not a common organism responsible for pharyngo-tonsillitis, but from above discussion, it is clear that it is becoming the main pathogen and effective measures to prevent *S. Aureus* infections are therefore urgently needed. A large scale multi centered study should be performed in the country regarding MRSA positive strain. This study also has a motive to make the population aware about the indiscriminate use of broad spectrum antibiotics. A uniform data system should be constructed for this purpose in Bangladesh.

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