

## Isolation and Identification of Organism from Throat Swab Along with Sensitivity Pattern from the Patients in North India.

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### ABSTRACT

**Background:** Sore throat is the one of the commonest complaint of the patients in ENT OPDs. The prevalent cause of sore throat in India is group A *streptococci* (GAS). But physicians across the country underestimate the real cause of the sore throat and prescribe the irrational use of antibiotic leading to development of resistance towards the antibiotics by the pathogens. **Methods:** The 100 throat swab samples were collected with all aseptic precautions from sore throat patients in ENT OPD and also from other department of microbiology from March 2014 to December 2015. And were sent to microbiology department for throat swab culture & Sensitivity reporting. **Result:** A total of 100 patients suffering from sore throats were included in this study of which 57 were males and 43 were females. Out of 100 patients 35 were pathogenic 59 were nonpathogenic & there were no growth in 6 patients. The age range of study is from 2 years to 70 years. The isolated organism were *E.Coli*, *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Staph aureus*, and *alpha haemolytic streptococci* were found out of 35 pathogenic organism. Biomodal peak of more pathogenic growth was observed in the month of September, November and December. Culture sensitivity reports showed high sensitivity in of various pathogens towards erythromycin (mostly), Pristinomycin, Cotrimoxazole, Linezolid, Vancomycin, Cefaperazone, Polymyxin B, Norfloxacin, Ampicillin and resistance towards Chloramphenicol, Gentamycin, Ampicillin, Cefazolin, Amoxicillin etc. **Conclusion:** This study gives us an insight to the current state of causative pathogens and their antimicrobial sensitivity from throat swab in Teerthankar Mahaveer Hospital. Alpha haemolytic *Streptococci* and *staphylococcus aureus* were the commonest organism isolated from throat swab.

**Keywords:** Microorganism, Sensitivity, Throat swab,

### INTRODUCTION

Sore throat is a painful inflammation of the mucous membranes lining the pharynx. A sore throat can result from infection (bacterial or viral), allergy, inflammation, trauma, malignancy, airway obstruction, and other abnormal processes.

A sore throat can indicate a relatively mild condition, such as irritation from shouting. It was due to moderate conditions, such as influenza (flu), upper respiratory infection, or adenoid disorder. It could also accompany quite serious conditions, such as airway obstruction, throat trauma, epiglottitis, or tumor of the larynx. A sore throat can also be due to a wide variety of other conditions, including laryngitis, strep throat, allergic reactions, postnasal drip, gastroesophageal reflux disease (GERD), mumps, and infectious mononucleosis.

A chronic sore throat was a long period of time can be caused by smoking or a tumor of the larynx.<sup>[1]</sup>

Symptoms of URI's commonly include cough, sore throat, runny nose, nasal congestion, headache, low grade fever, facial pressure and sneezing. Onset of symptoms usually begins 1–3 days after exposure. The illness usually lasts 7–10 days.<sup>[2]</sup>

The major causative agents of sore throat infections are *streptococcus pyogenes* (most common), *streptococcus* group C & G, *Corynebacterium diphtheriae*, *Haemophilus influenza*, *Bordetella pertussis*, *Treponema vincentii*, *Leptotrichia buccalis*. Group-A beta hemolytic *streptococcal* pharyngitis/tonsillitis (*strep* throat) typically presents with a sudden onset of sore throat, pain with swallowing and fever. *Strep* throat does not usually cause runny nose, voice changes or cough.<sup>[3]</sup> The prevalence of asymptomatic carriage of group A *streptococci* (GAS) the main cause of sore throat, in all parts of India has been reported to lie in range of 11.2-34%.<sup>[4]</sup> The highest incidence occurs between 4-5 years; while school children between the ages of 6 to 12 years are highly predisposed. Its occurrence in elderly has been described as unusual.<sup>[5]</sup> Acute pharyngitis accounts for 1.3% of outpatient visits to

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health care providers in the United States, and it accounted for an estimated 15 million patient visits in 2006.<sup>[6]</sup> Group A streptococcus (*Streptococcus pyogenes*) is responsible for 5 to 15% of cases of pharyngitis in adults and 20 to 30% of cases in children.<sup>[7]</sup> Streptococcal pharyngitis occurs most commonly among children between 5 and 15 years of age.

Pharyngeal carriage rates of Group-A & G *Streptococci* among children varies with different geographical location and seasons. Penicillin is the first choice for treatment of pharyngeal and most other infections with this organism, Antimicrobial resistance among GAS is an emerging concern.<sup>[8]</sup>

### MATERIALS AND METHODS

The samples collected for this study were throat swab from faeces. Sterile swab sticks were used to collection of sample. 100 throat swab was collected in two consecutive swab sticks for each sample, one for the direct gram's staining and another for culture. Throat swabs were inoculate directly on, chocolate, blood & Mac Conkey agar plates by streaking. The plates were incubated under aerobic condition in 5-10% carbon dioxide atmosphere at 37°C for 24-48

hours. The identification of organisms was done by standard microbiological test and antibiotic sensitivity was performed by Kirby Bauer method.

### RESULT

In this study we included 100 patients of age range from 2 years to 70 years, ENT department of Teerthanker Mahaveer Medical College and Research Center (T.M.M.C & R.C) Moradabad, Uttar Pradesh. Out of 100 patients 57 were males and 43 were females. Among them 35 were pathogenic, 59 were nonpathogenic & there were no growth in 6 patients. Above chart shows, out of 100 patients, there were 59(59%) cases in nonpathogenic organism, *E.coli*, *Klebsiella pneumonia*, *Streptococcus pneumoniae* were found in 2 (2%) cases, Staph aureus found in 4 (4%) cases and *streptococcus pyogen* were found in 25(25%) cases. There were no growth in 6 (6%) cases. The above chart showed isolation of pathogenic organism, most frequently *Alpha hemolytic streptococci* 25(71%) were isolated followed by *Staphylococcus aureus* 11%), *E.Coli*(6%), *Klebsiella* (6%) and *Streptococcus pneumoniae* (6%) were found [Table 1,2],[Figure 1-3].

**Table 1:** Antibiotic sensitivity patterns of gram negative bacteria isolated from sore throat patients.

Antibiotics	<i>E.coli</i> (sensitive %)	<i>klebsiella</i> (sensitive %)
Ampicillin	00%	00%
Ampicillin /sulbactam	50%	50%
Tobramycin	100%	50%
Gentamycin	50%	100%
Ciprofloxacin	100%	100%
Polymyxin B	100%	100%
Tetracycline	100%	100%
Meropenem	100%	100%
Piperacillin	50%	50%
Imipenem	100%	100%

**Table 2:** Antibiotic sensitivity patterns of gram positive bacteria isolated from sore throat patients.

Antibiotics	<i>α-haemolytic streptococci</i> (Sensitive %)	<i>Stepto. Pneumoniae</i> (Sensitive %)	<i>Staph. aureus</i> (Sensitive %)
Ampicillin	20%	50%	00%
Linezolid	100%	100%	100%
Gentamycin	16%	100%	100%
Erythromycin	84%	100%	100%
Ciprofloxacin	56%	50%	75%
Penicillin	12%	50%	00%
Vancomycin	24%	50%	100%
Tertracyclin	56%	100%	25%
Cotramoxazole	56%	100%	25%
Azithromycin	32%	50%	75%
Pristonamycin	76%	100%	100%

**DISCUSSION**

100 patients were included in this study out of which 57 were male and 43 were female. Among them 35 patients were suffered from pathogenic organisms, more prevalent pathogenic organism were *alpha haemolytic streptococcus* in 25 (71%) followed by *Staphylococcus aureus* 4 (11%), *Sterptococcus pneumoniae* 2 (6%), *E.coli* 2 (6%) and *Klebsiella Pneumoniae* 2 (6%). But in other study the predominant pathogenic organism grown was coagulase positive *staphylococcus* in 30 cases out of 375 reports and *alpha haemolytic streptococcus* in 62 cases. The percentage of pathogens grown in his series is 58%.<sup>[9]</sup>

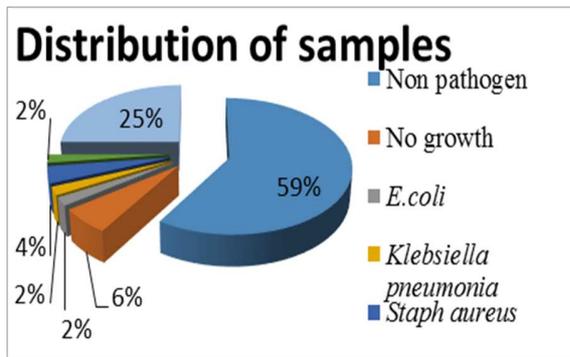


Figure 1: Distribution of samples on the basis of findings.

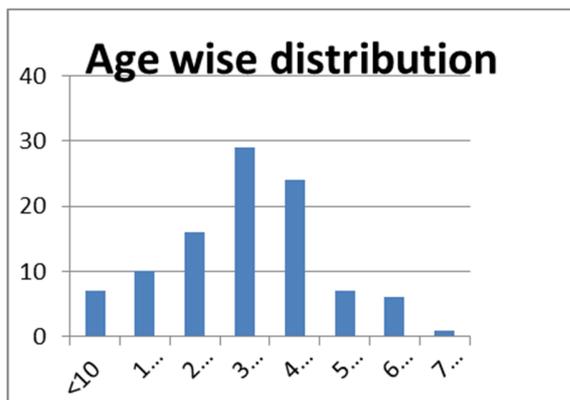


Figure 2: Shows the Age wise distribution of patients of sore throat.

In our study, *Klebsiella pneumoniae*, *E.coli*, *streptococcus pneumoniae* were found in 2 (6%) in cases respectively .There were no growth in 6 cases and no *diphtheroid* was found. The pathogenic organisms were grown in 35 cases out of 100 samples. But in Pramod E jadhav et.al Int j Bio Med. research 2013; 4(1)2915-2919 *Klebsiella pneumonie* were seen in 19 cases, *E.coli* grown in 6 culture,

*Pseudomonas aeruginosa* were grown in 9 cases and there were no growth in 40 cases out of 375 Samples.

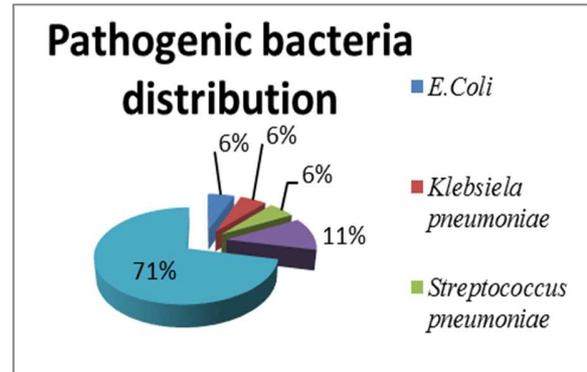


Figure 3: Shows growth of pathogen in throat swabs culture in percentage.

In our study, Pathogenic organisms were grown maximally in the month of September, November and December and minimum in month of April and March But in Pramod E jadhav et.al Int j Bio Med. research 2013; 4(1)2915-2919 Pathogenic organisms were grown maximally in the month of July and also during May and summer to rainy season and dampness in the region and moist September. Change of climate from weather in the month of July in our region can be the factor for this finding. This contradicts with the report given by Peter G. et.al that shows a bimodal peak of *streptococcal* pharyngitis in spring and winter months.<sup>[10]</sup> Nandi S. et.al also reported bimodal peak during the month of November to January and in august.<sup>[11]</sup>

In our study, *Staphylococcus aureus* were highly sensitive to vancomycin (100%) and gentamycin (100%) and least sensitive to Co-trimoxazole (25%), *Alpha haemolytic Streptococci* were found to be highly sensitive to erythromycin (84%) cases and pristinomycin (76%) and least sensitive in Ciprofloxacin(56%) cases and in some extent to penicillin(12%) , *Klebsiella pneumoniae* were highly sensitivity to Cefaperazone(100%), Polymicin-B (100%), and Norfloxacin (100%) and least sensitive to Amikacin, amoxicillin.

**CONCLUSION**

This study gives us an insight to the current state of causative pathogens and their antimicrobial sensitivity from throat swab in Teerthanker Mahaveer Hospital. Higher prevalence of sore throat contains in the age group 31-40 years. Change of climate from weather in the month of July in our region can be the factor for this finding.

About two-thirds of all clinical pharyngitis is caused by viruses. They are self-limiting diseases and for which no effective treatment has been required. Benzathine penicillin is the method of choice of drug for streptococcal pharyngitis.

To advise the patient suffering from sore throat infection, we give them to drink warm liquids such as lemon tea or tea with honey, gargle several times a day with warm salt water, drink cold liquids or suck on fruit-flavored ice pops. Use of a cool-mist vaporizer or humidifier can moisten the air and soothe a dry and painful throat.

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