

Microbiological Study of Pharyngitis at a Teaching Hospital, Chinakakani, (Andhra Pradesh) India

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Abstract—The aim of the study was to observe the prevalence of various microorganisms from throat swab specimens in patients attending a tertiary care hospital at Chinakakani, Guntur. Throat swab specimens were collected aseptically from 100 patients and cultured on appropriate bacteriological media. Isolates were identified by biochemical tests & antimicrobial susceptibility performed by standard methods. Out of 100 Samples, culture was positive in 25 samples. So Bacterial infection was found in 25% of Pharyngitis. *Streptococcus pyogenes* was the commonest isolate, followed by *Staphylococcus aureus* and *Candida albicans*. Majority of bacteria were *Streptococcus pyogenes*, *Staphylococcus aureus* and *Candida albicans*. In 60% it was mixed infection. The susceptibility patterns varied depending on the drugs, but most of the organisms were susceptible to penicillin, erythromycin and vancomycin. Improved personal hygiene and health education of the masses on how to care for ear, nose and throat will greatly reduce these microbial infections. This study will be useful for control strategies and for predicting pathogen prevalence in throat swabs.

Keywords— Pharyngitis, *Streptococcus Pyogenes*, Throat Swab

I. INTRODUCTION

Infections of throat have a tremendous impact on public health. Respiratory tract infection (RTI) is considered as one of the major public health problems and a leading cause of morbidity & mortality in many developing countries.¹ *Streptococcus pyogenes* is one of the commonest bacterial pathogens that causes acute pharyngitis among school-aged children living in lower socio-economic conditions. These Gram- positive cocci are distributed worldwide and have been associated with a variety of sequelae such as inpetigo, otitis media, necrotizing fasciitis, glomerulonephritis, acute rheumatic fever / rheumatic heart disease (RF| RHD).²

This present study was aimed to elucidate the prevalence of potential pathogenic microorganisms in throat swab samples from patients with pharyngitis.

II. METHODOLOGY

This case series type of descriptive study was conducted Department of Microbiology from Feb 2008 - Jan 2009. The population included the patients who visited NRI General Hospital with signs and symptoms of pharyngitis.

2.1 Study Population

For the study purpose all the cases of Pharyngitis attended at outdoor of NRI General Hospital, Chinakakani, (AP) India. Among these cases, cases who are not willing to participated in the study were excluded from the study. Total 100 Pharyngitis cases were identified and included in this study.

Every eligible cases of Pharyngitis was interrogative as per pre designed proforma to gather desired information about case in detail. And throat swabs were collected from symptomatic cases & processed by direct microscopy, culture and antibiotic susceptibility test. Direct microscopy was done by Gram's method. Specimens were inoculated on Blood Agar & MacConkey agar plates. Any growth is identified by morphology, motility, colony characteristics and bio-chemical tests. Antibiotic sensitivity is performed by disc diffusion.

Data thus collected were summaries and analyzed in percentage and proportions on MS Excel.

III. RESULTS

Study population for this study was in the age group of 1 year to 54 years with mean age 16.5 ± 6.2 years with female preponderance.

Out of total 100 throat swabs were collected in this study, culture was positive in 25 (25%) samples otherwise other 75 were culture negative. (Figure 1)

Figure 1

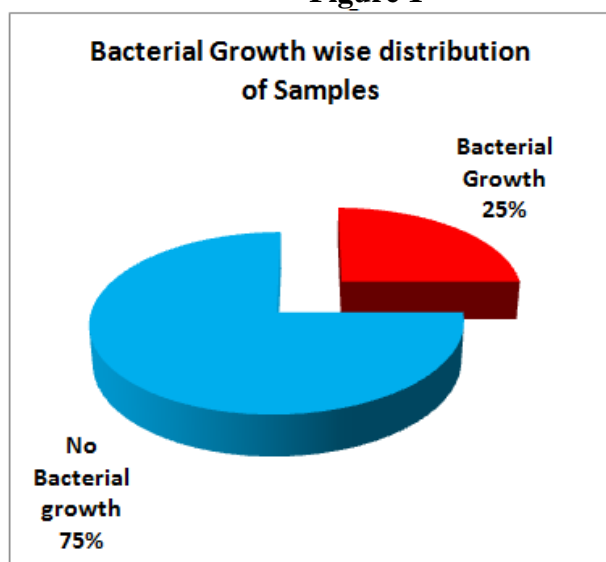
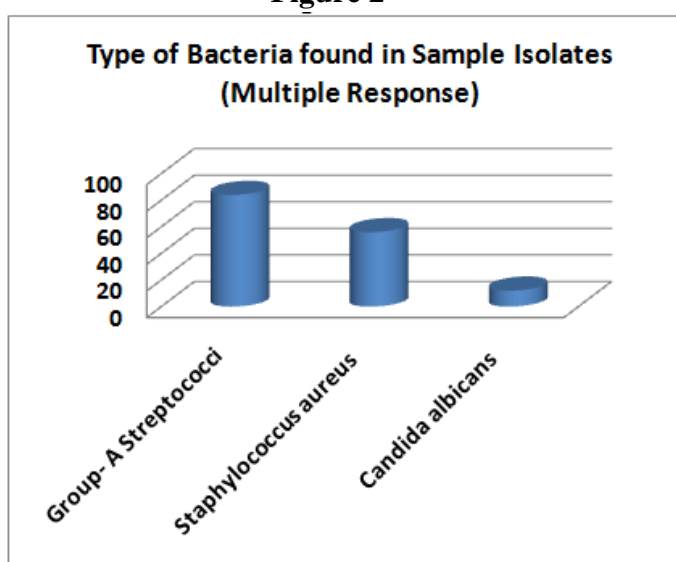


Figure 2



When these cultures were further processed it was explore that Group-A Streptococci were the most common organisms isolated followed by Staphylococcus aureus and Candida albicans. Out of total 25 isolates, Group-A Streptococci were found in 22 (88%) followed by Staphylococcus aureus 14 (56%) and Candida albicans 3 (12%) of sample isolates. (Figure 2)

When these isolates were further analysed as per age, it was found that Streptococci were found in all the age groups and Staphylococcus aureus & Candida albicans found in >15 years of subjects additionally along with Group- A Streptococci.

On further analysis, in age group of <15 years all the total 7 isolates with bacterial growth were of Group-A Streptococci whereas in age group 16-30 years, out of total 3 isolates found to have bacterial growth which includes in one isolates Streptococci & Staphylococcus aureus and in other one Streptococci & Candida albicans and in other one Staphylococcus aureus. In the age group of 30-45 years out of total 5 isolates found to have bacterial growth 4 isolates had Streptococci & Staphylococcus aureus and in other one Streptococci & Candida albicans. In the age group of >45 years out of total 8

isolates found to have bacterial growth 6 isolates had Streptococci & Staphylococcus aureus and in other one all the three i.e. Streptococci, Staphylococcus aureus & Candida albicans. On analysis this variation in distribution of organism as per age was not found with significant difference ($p > 0.05$). (Table 1)

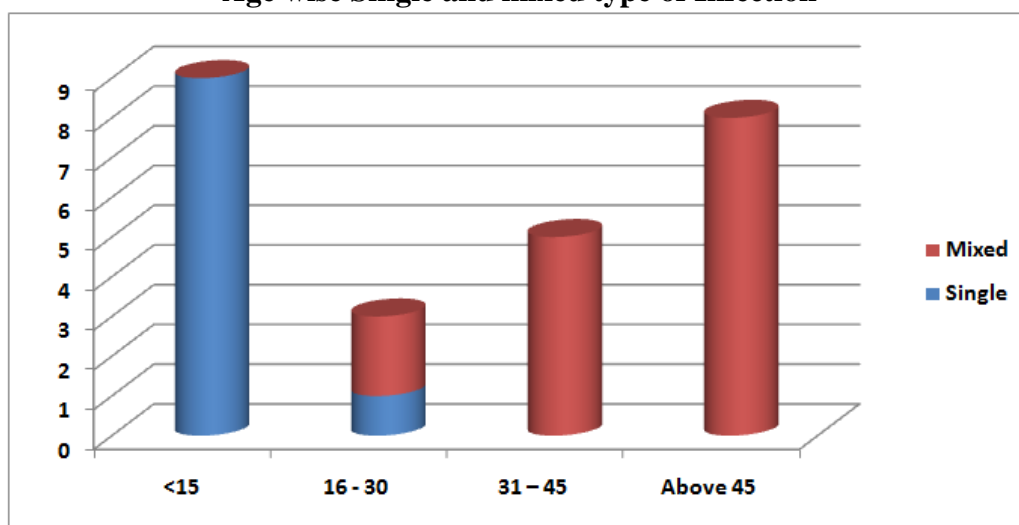
Table 1
Association of Age with Pathogens isolated in Study Samples

Age (in years)	Organisms isolated			Total sample with Bacterial Growth
	Group- A Streptococci	Staphylococcus aureus	Candida albicans	
1 - 15	9	0	0	9
16 - 30	2	2	1	3
31 - 45	4	5	1	5
Above 45	7	7	1	8
Total	22	14	3	25

Chi-square = 10.060 with 6 degrees of freedom; $P = 0.122$ LS=NS

Out of the 25 positive cultures, single pathogen was found in 10 cases (40%). Group –A Streptococci was found singly in 1-15 yrs age group and Staphylococcus aureus was found in sample of 16-30 years age group otherwise all other 15 cases (60%). were found as mixed infections. (Table 1 & Figure 3).

Figure 3
Age wise Single and mixed type of Infection



In this study most of the gram-positive organisms were sensitive to penicillin, erythromycin and vancomycin

IV. DISCUSSION

In this study out of 100 samples of throat swab, culture was positive in 25 samples. Other authors showed varied observations like in one side Wakode PK et al (2003)³ found 130 sample positive for bacterial growth out of 305 total samples studied i.e. positivity found was 42.62% and in other side Pramod E et al (2013)⁴ found 40 isolates with bacterial growth out of total 375 sample studied so

culture positivity 10.23%. This positivity is reducing with the time may be because of adverse conditions for bacterial growth. In this study also it is just 25% so is in resonance with studies conducted in this era.

In present study, *Streptococcus pyogenes*, *Staphylococcus aureus* and *Candida albicans* were bacteria found in isolates. In this study, the most prevalent organism was *Streptococcus pyogenes*, followed by *Staphylococcus aureus* and *Candida albicans*. In present study Group-A Streptococci were found in 88% of isolates with bacterial growth followed by *Staphylococcus aureus* 56% and *Candida albicans* 12% of sample isolates. These observations were quite in resonance with observations of Sobhan N et al (2001)⁵ who also found most prevalent organism *Streptococcus pyogenes* in throat swab culture. Another authors^{6,7,8} also reported primary pathogen of oropharynx as *Streptococcus pyogenes* and *Staphylococcus aureus* as a secondary pathogen.

In present study most of the gram-positive organisms were sensitive to penicillin, erythromycin and vancomycin. Wakode PK et al found that isolated bacteria in throat swabs were found to be sensitive with Cefotaxime, tetracycline, penicillin and gentamicin.


V. CONCLUSION

Bacterial infection was found in 25% of Pharyngitis. Majority of bacteria were *Streptococcus pyogenes*, *Staphylococcus aureus* and *Candida albicans*. In 60% it was mixed infection. *Streptococcus pyogenes*, and *Staphylococcus aureus* found as single infection but *Candida albicans* found as mixed with other bacteria. Control of throat infections demands the availability appropriate treatment as most of bacteria were sensitive to penicillin, erythromycin and vancomycin. Improved personal hygiene and health education of the masses on how to care for ear, nose and throat will greatly reduce these microbial infections.

CONFLICT

None declared till date.

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