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Original Research Article

Study of blood groups and throat swab culture in chronic tonsillitis among pediatric age group

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ABSTRACT

Background: Chronic tonsillitis is a disease of childhood with a peak incidence at 5-6 years of age and the commonest organism being Group A beta hemolytic streptococcus (GABHS). Accurate diagnosis of streptococcal infection is essential to limit transmission, reduce the complications and period of communicability. To study the association between blood groups and culture findings of throat swab in chronic tonsillitis among pediatric age group is the aim of our study.
Methods: 60 pediatric patients of clinically diagnosed chronic tonsillitis of both genders who attended outpatient department of otorhinolaryngology and head and neck surgery VIMS, Ballari, Karnataka, India were included in this study on simple random basis. Throat swabs obtained from them were subjected for culture test along with blood grouping and Rh typing.
Results: In our study, among 60 patients, who presented with recurrent episodes of throat pain for duration of <1 year were 31 (51.7%), of 1-3 years were 15 (25%) and of >3 years were 14 (23.3%). 42 patients (70%) had grade 3 tonsillar enlargement, 14 (23.3%) had grade 2 and 4 (6.7%) had grade 4 tonsillar enlargement. 22 were of B positive blood group (36.7%), 19 of O positive (31.7%), 12 of A positive (20%) and 7 patients of AB positive blood group (11.7%).
Conclusions: Statistically significant association is found among school going age group of both genders infected by the *Streptococcal* species ($p<0.05$). Patients of O positive blood group were infected more followed by B positive blood group.

Keywords: Group A beta hemolytic streptococcus, Chronic tonsillitis, Blood groups

INTRODUCTION

Infectious diseases involving pharyngeal tonsils account for significant proportion of childhood illnesses and pediatric health expenditure resulting in need of its management.[1] Efforts have been made during past decades to manage infectious diseases of tonsil. It has been reported that diseases of tonsil may reach paranasal sinuses, upper aerodigestive tract, Eustachian tube, middle ear cleft.[2]

The debris of microorganisms, desquamated epithelium and food present within the crypts may be implicated in the development of acute and recurring inflammation. Thus the microbes involved and the pathophysiology of chronic tonsillitis needs to be understood for further management.[3]

This study emphasizes on the association between blood group and culture findings of throat swab in chronic tonsillitis among pediatric age group.

METHODS

This is a prospective study conducted for a period of 1 year from March 2018 to February 2019 in the Department of Otorhinolaryngology head and neck surgery VIMS, Ballari, Karnataka, India. The patients were selected on simple random basis after taking informed written consent from the parents /guardians. We included 60 clinically diagnosed chronic tonsillitis patients of pediatric age group of both genders attending the outpatient department of otorhinolaryngology.

Inclusion criteria

All chronic tonsillitis patients of paediatric age group.

Exclusion criteria

Paediatric patients with acute on chronic tonsillitis patients, unilateral peritonsillitis patients and membranous tonsillitis patients.

Throat swabs were obtained from them and were subjected for the culture test. We also investigated them for ABO blood groups and Rh factor.

Statistical analysis and methods

Data was collected by using a structured proforma. Data entered in MS excel sheet and analyzed by using SPSS 23.0 version IBM USA. Qualitative data was expressed in terms of proportions. Quantitative data was expressed in terms of Mean and standard deviation. Association between two qualitative variables was seen by using chi square/ Fischer's exact test. Descriptive statistics of each variable was presented in terms of Mean, standard deviation, standard error of mean. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant.

RESULTS

In our study, among 60 patients, 31 were male (51.7%) and 29 were female (48.3%) (Figure 1). Those aging 6-10 years were 32 (53.3%) and 11-15 years were 25 (41.7%) an 3 patients were <5 years of age (5%) (Figure 2). Patients who presented with recurrent episodes of throat pain for duration of <1 year were 31 (51.7%), of 1-3 years were 15 patients (25%) and 14 patients (23.3%) had symptoms for >3 years (Figure 3). 42 patients (70%) had grade 3 tonsillar enlargement, 14 patients (23.3%) had grade 2 and 4 patients (6.7%) had grade 4 tonsillar enlargement (Figure 4). 22 patients were of B positive blood group (36.7%), 19 patients were of O positive (31.7%), 12 patients of A positive (20%) and 7 patients of AB positive blood group (11.7) (Figure 5). Most common organism isolated from throat swab culture is found to be streptococcus species among both genders in school going age group (Figure 6 and 7). This study results are indicative of strong association between tonsillar enlargement as a result of chronicity and the *Streptococcal* species ($p<0.05$) infection (Figure 8).This organism is more commonly found in O positive (11 patients, 57%) blood group individuals followed by individuals of B positive blood group (12 patients, 54.6%) (Figure 9).

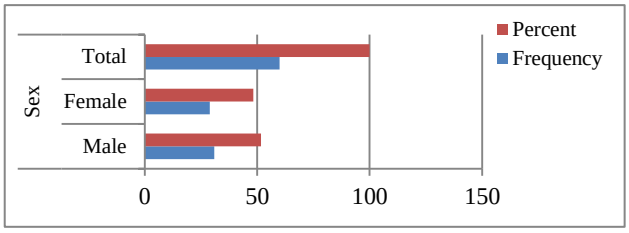

Figure 1: Distribution according to sex.

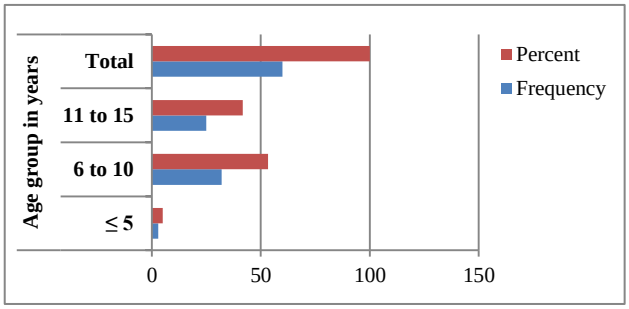

Figure 2: Distribution according to age.

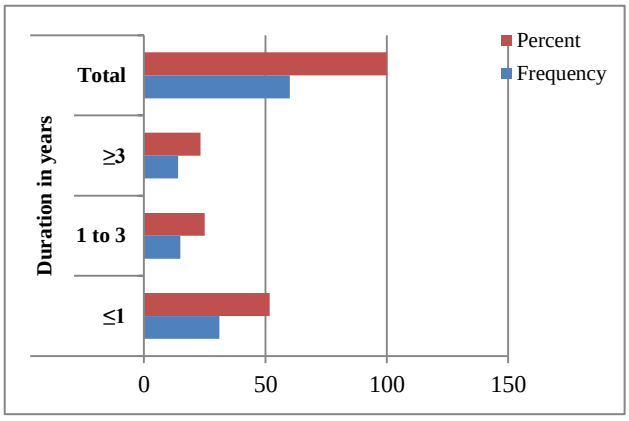

Figure 3: Distribution according to duration of illness.

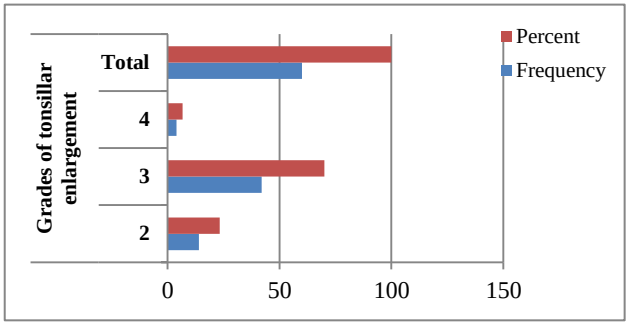

Figure 4: Distribution according to grades of tonsillar enlargement.

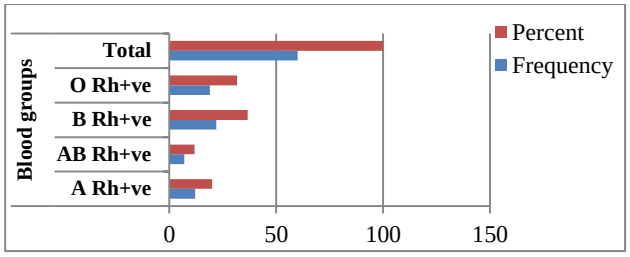

Figure 5: Distribution according to blood group.

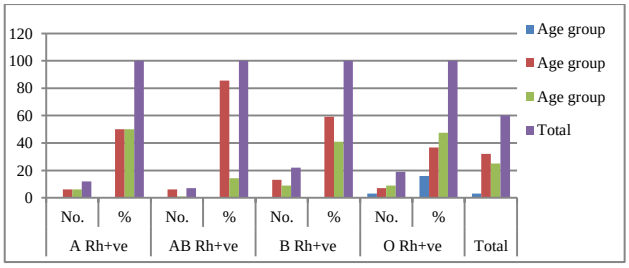

Figure 6: Distribution of subjects according to age and blood groups.

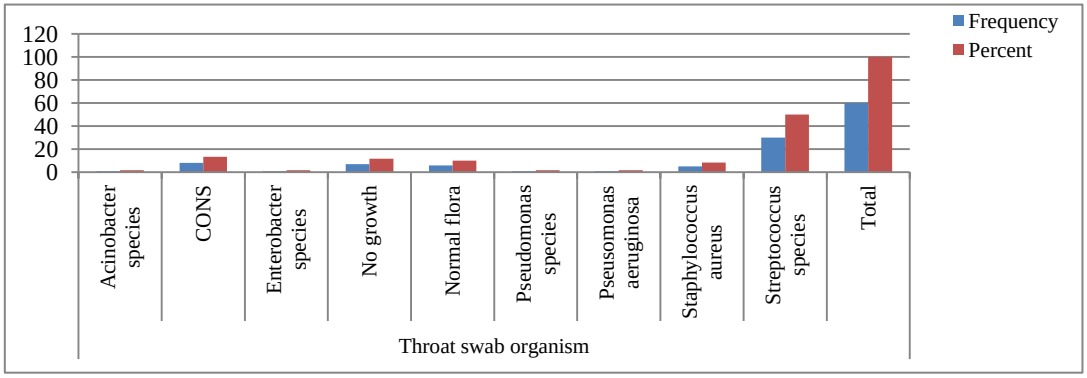

Figure 7: Distribution according to throat swab culture organism.

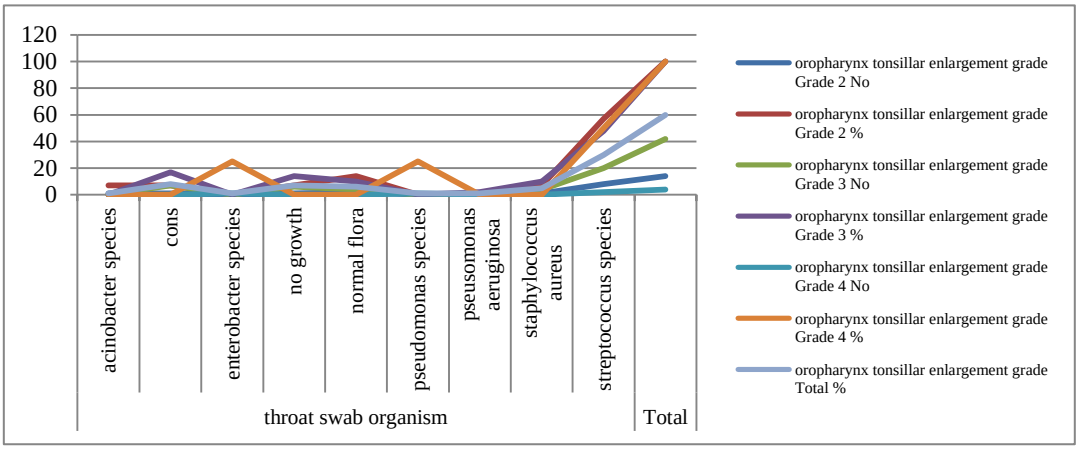

Figure 8: Distribution of subjects according to throat swab culture organism and tonsillar enlargement.

Chi square: 46.79; p value: 0.041 (<0.05), significant.

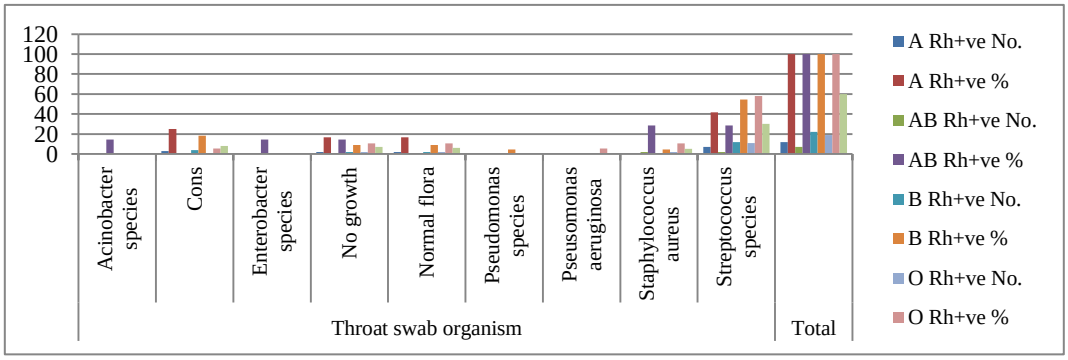

Figure 9: Distribution of subjects according to throat swab culture and blood groups.

Chi square: 30.2 ; p value: 0.35 (>0.05), not significant.

DISCUSSION

Chronic tonsillitis is one of the prevalent infections in children and adolescents which necessitate its management according to the paradise criteria.[4,5]

Chronic tonsillitis might be caused by bacterial or viral agents. The commonest bacterial cause being Group A beta hemolytic streptococcus (GABHS).[6-8] GABHS is implicated in 15% to 30% of children who present with tonsillopharyngitis.[9,10]

The other organisms which can be found on the surface of diseased tonsils are *Haemophillus influenza*, *Staphylococcus aureus*, *alpha hemolytic streptococci*, *Brahmella* spp, anaerobes, Chlamydia, mycoplasma and respiratory viruses.[11,12]

A single throat culture is 90% specific and 90% to 97% sensitive for GABHS growth making it the diagnostic test of choice.[13] The period of communicability can be reduced if GABHS is diagnosed and treated early in the clinical course.[14]

In our study, the most commonly isolated organism among both genders is *Streptococcus* species among school going age group. This result is similar to the study conducted by AlAni in Iraq. They also found the positive rate of chronic tonsillitis in blood group O positive.[15]

Among ABO blood group distribution in India, the most prevalent blood group is O followed by B, A, AB blood groups.[16] The A, B, O blood group systems were first described by Karl Landsteiner in 1900 and the AB blood group was later described by Von Decastallo and Sturli in 1902.[17]ABO blood group system is mapped at 9q 34.2 region and the H antigen being the precursor antigen for AB, A, B blood group formation is coded by H gene on Chromosome 19.[18, 19]

Very few studies in the literature compared the throat swab culture findings and the blood groups. To find out the association if any between ABO blood groups and the throat swab culture findings was the purpose of our study.

This study results are indicative of strong association between tonsillar enlargement and the Streptococcal species infection of both genders indicating the chronicity.

But in a study conducted by Fadhil (1989), they found the highest rate of chronic tonsillitis in B positive blood group individuals.[20]

CONCLUSION

This study results are indicative of strong association between tonsillar enlargement as a result of chronicity and the *Streptococcal* species ($p<0.05$) infection among the school going children of both genders. Individuals of O positive blood group are more commonly infected by *Streptococcus* followed by individuals of B positive blood group. Further studies are required in larger sample size in this regards along with explorating genome studies for the loci of chromosome determining blood groups and their role in the chronicity of this disease.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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