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Original Research Article

Analysis of knowledge about acute granular pharyngitis among Tiruchirapalli school children and their parents: connotation for preventing further complications

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ABSTRACT

Background: Identification and appropriate treatment for the streptococcal pharyngitis decreases the risk of acute rheumatic fever and rheumatic heart disease. By understanding the public perceptions and behaviors related to sore throat is considered as the fundamental for disseminating the health programs to control such diseases. The main objective of this study is to understand the epidemiology and microbiology of acute granular pharyngitis and its treatment in a tertiary care teaching hospital of South India.
Methods: This is a prospective and cross-sectional investigation performed by direct interview and written surveys. In this study, school students and their parents were interviewed about the history of sore throats in the last 12 months and treatment received. A focused history and physical examination to detect pharyngitis was conducted and children were referred for follow-up as indicated.
Results: A total of 1550 and 1450 students from 13 and 14 schools participated in the study respectively, along with their parents. Three hundred and thirty six (21.6%) parents reported their child had at least one episode of sore throat in the previous year, and 326 (21%) of students reported at least one sore throat in the same time period.
Conclusions: Girls were reported to have high level of pharyngitis than boys. Parents have variable knowledge about the frequency of sore throat in their children and its management. These results provide insight into current perceptions and practices related to sore throat and will be used to design public awareness activities aimed at reducing the future risks.

Keywords: Pharyngitis, Children, Cross-sectional study

INTRODUCTION

Throughout the world, rheumatic heart disease (RHD) is an observable complication while the pharyngitis due to β-haemolytic streptococcal is not treated properly.[1,2] This disease is found among poverty and reflection of its enduring neglect, robust assessments of its prevalence were reported recently. A newer study reviewed the estimation of maximum of 33 million people are living with RHD and more than 3 lakhs people die every year due to this disease.[3,4] Few studies from other than Indian countries consistently revealed the field based assessment of such clinical issues by portable echocardiography and it was found estimation rates of more than 2%.[5-8]

Antibodies elicited to the bacterial pathogen cross react with proteins in the heart, thereby RHD is very frequently observed among pharyngitis patients.[1] Further, the untreated pharyngitis leads to acute rheumatic fever (ARF) and characterized by progressive damage to heart valves spurred by repeat exposures to the bacterial pathogen; while in complicated clinical phases, the

patients are at risk of debilitating endocarditis, heart failure, stroke and premature death.[1,3] For these situations, the clinical epidemiologists have to come forward to expand the health policy, implementing the programmes and research that are very much supporting for combating the disease.[9-11]

The first and foremost priority should be the appropriate treatment for streptococcal pharyngitis with antibiotics and it has been emerged to treat immediately because this monobacterial infection is increasing the morbidity and mortality by ARF and RHD.[12,13] The national public health interventions and policies should be implemented in every area of the countries; especially for school students and their parents by the experiences field workers including epidemiologists, clinical experts, public health managers and inspectors for primary prevention.[14,15] The policies related to pharyngitis and its control measures have to be followed as per the guidelines of World Health Organization and World Heart Federation.[16,17] As a result, concerted efforts are underway in various parts of the world, including in sub-Saharan Africa, to scale-up health workers' capability to satisfactorily manage patients that present with sore throat.[12,13]

This reduction and elimination of the risk of RHD by infections pharyngitis should be treated with antibiotics with due course, posology, time and special care.[18] The individual, household, and/ or community have to be educated and counseled to control and eventually eliminate RHD.[19] The basic information related to sore throat should be given in the pamphlets to be distributed among the people who are at risk and school based screening for assessing RHD may give a clue to proceed further investigations about the pharyngitis and its treatment and guide the parents appropriately. This present study was conducted to identify the prevalent acute pharyngitis among the school students to avoid the further clinical complications.

METHODS

The study population consisted of healthy children and young adults in the schools of Tiruchirapalli, South India, between June 2016 and December 2017. The random sampling procedure was followed to include the students in this study (Engel et al).[8] Both genders who are studying from classes 1 to 12 of both in both government and private schools were included. Institutional ethics committee clearance was obtained (CMHC&RC/ IEC-No: 85 dated 13.05.2015) and the research member approached the institutional head and got permission before initiating and interviewing the students and parents. The written informed consent was obtained only from individual parents of the students whose age is 8 and below; both written informed assent and consent were obtained from the students whose age of above 8. The students whose assent were satisfactory and the individuals who are available on the day of study were included.

Before data collection, the study participants were assessed for the signs and symptoms of ARF and RHD by the ENT specialist and clinical nurse; further echocardiogram was done to all participants to identify students for the severity of the acute granular pharyngitis i.e. RHD. All the study subjects (school students) and their parents were interviewed and asked to report the number of episodes of sore throat that they had in the previous 12 months and its treatment strategies. If treatment, type of therapy (antibiotics) and mode of treatment. In general, amoxicillin and penicillin by oral or intramuscular injections are recommended to treat the sore throat.[20] Furthermore, this study did not include the type of name of antibiotics prescribed for the students while they examined for sore throat.

The focused clinical history and physical examination of each and every student were done in order to detect for symptoms of pharyngitis. Further, the students those who are having the abnormal clinical conditions were referred to the study centre (Trichy SRM Medical College Hospital and Research Centre) for health check-up and initiating the necessary treatment modalities. All the data collected were statistically analyzed for descriptively.

RESULTS

A total of 1550 children and adolescents were participated with their parents. The students from 13 different schools were included thereby each school provided the range of 100 to 120 students. The students ranged in age from 5 to 17 years were included in this study. A total of 936 males (60.4%) and 614 females (39.6%) were involved. The socio-demographic data were depicted in Table 1.

Out of 1550 students, 336 students have experiences of having sore throat in the last years by the data given by the parents for the same was varied. Among them, 82 (24.4%) were males and 254 (75.6%) were females; 64 (19%) students have experience in more than 3 episodes of sore throat in the previous year. On other hand, the results of the parents data revealed that the maximum of 168 parents (10.8%) do not know about the history of sore throat (Table 2). Among the parents of male students are having lesser idea (124; 73.8%) about the observation of sore throat among their child than parents of female students (26.2%).

In the current year of observation, three hundred and twenty six (326; 21%) students have experiences of having sore throat in the present year; where 104 (31.9%) were males and 222 (68.1%) were females. Among them, 135 (41.4%) students have experience in single episode of sore throat in the current year. On other hand, the results of the parents' data revealed that the maximum of 1076 parents (69.4%) revealed that their children don't

have such infections and sore throat (Table 3). Here also, among the parents of male students was having lesser idea (106; 63%) about the observation of sore throat among their child than parents of female students (62; 37%). The comparative analysis of previous and current year observations of sore throat among the students were depicted in Figure 1.

Table 1: Socio-demographic data of the subjects (n=1550).

Characteristics	Male (n=936)	Female (n=614)
	N (%)	N (%)
Age groups (in years)		
5–7	306 (32.7)	216 (35.2)
8–10	215 (23)	156 (25.4)
11–14	210 (22.4)	191 (31.3)
15–17	219 (23.4)	051 (8.3)
Locality		
Rural	615 (65.7)	316 (51.5)
Urban	321 (34.3)	298 (48.5)
Availability of both parents		
Yes	831 (88.8)	569 (92.7)
No	036 (3.8)	11 (1.8)
Either/or	069 (7.4)	34 (5.5)
Parent's occupation	**(n=900)**	**(n=603)**
Daily wages	124 (13.8)	110 (18.2)
Agriculture	594 (66)	398 (66)
Driver	106 (11.8)	043 (7.1)
Business	042 (4.7)	21 (3.5)
Professionals	034 (3.7)	31 (5.2)

Figures in parenthesis denoted percentages.

Table 2: Observation of episodes of sore throat in the previous year (2016).

Episode(s) of sore throat	Observation of episodes of sore throat			
	Reported by students		Reported by parents/guardians	
	Males (n=936)	Females (n=614)	Males (n=936)	Females (n=614)
	N (%)	N (%)	N (%)	N (%)
Once	42 (4.5)	122 (19.9)	39 (4.2)	85 (13.8)
Twice	19 (2.0)	89 (14.5)	41 (4.4)	56 (9.1)
More than twice	21 (2.3)	43 (7.0)	39 (4.2)	22 (3.6)
No infection	811 (86.6)	294 (47.9)	693 (74.0)	407 (66.3)
Don't know	43 (4.6)	66 (10.7)	124 (13.2)	44 (7.2)

Figures in parenthesis denoted percentages.

Table 3: Observation of episodes of sore throat in the current year (2017).

Episode(s) of sore throat	Observation of episodes of sore throat			
	Reported by students		Reported by parents/guardians	
	Males (n=936)	Females (n=614)	Males (n=936)	Females (n=614)
	N (%)	N (%)	N (%)	N (%)
Once	36 (3.8)	99 (16.1)	33 (3.5)	91 (14.8)
Twice	29 (3.1)	73 (11.9)	56 (6.0)	49 (8.0)
More than twice	39 (4.2)	50 (8.1)	46 (4.9)	31 (5.0)
No infection	767 (82.0)	336 (54.7)	695 (74.3)	381 (62.1)
Don't know	65 (6.9)	56 (9.2)	106 (11.3)	62 (10.1)

Figures in parenthesis denoted percentages.

Table 4: Place of treatment for pharyngitis.

Treatment location	Previous year (2016) (n=304)	Current year (2017) (n=311)
	N (%)	N (%)
Government hospital	116 (38.2)	121 (38.9)
Home remedies	22 (7.2)	21 (6.8)
Private clinics	82 (27.0)	85 (27.3)
Pharmacy	60 (19.7)	59 (19)
Traditional method	22 (7.3)	16 (5.1)
Others	02 (0.6)	09 (2.9)

Figures in parenthesis denoted percentages.

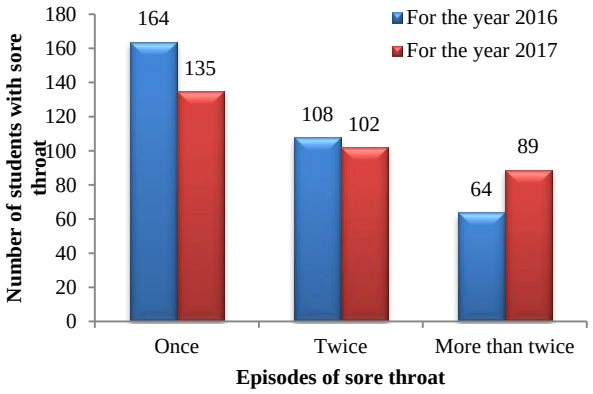

Figure 1: Details of episodes of sore throat for the year 2016 (n=336) and 2017 (n=326).

Further, the regression analysis with stepwise variable selection was performed to identify predictors of the number of reported sore throats among the following variables: age, gender and locality. The observable variable correlated with the data among students and parents was gender. Female students reported more episodes than male students. Similarly, parents or guardians reported more episodes for their daughters than their sons.

The treatment practices for pharyngitis among the school students were reviewed according to the data given by the parents; thereby out of 336 students, 304 (90.5%) were followed treatment practices. But in the current year, among 326 students those who are having sore throat, 311 (95.4%) undergone treatment. Treatment on three or more occasions was reported among 64 (19%) and 61 (18.7) students in previous and current years respectively. Most of them treated from government hospitals followed by private clinic and directly obtained from pharmacy (Table 4).

DISCUSSION

This is the first time in this area to investigate the epidemiology of pharyngitis in Tiruchirapalli, South India among school students and their parents. This knowledge, attitude, perceptions and behavior about sore throat among school students provide much information that they have to educate properly and execute awareness campaigns. Sore throat and pharyngitis are the twinning issues found among school children, where spreading the infection is common. Viruses are the usual etiology for the common sore throat among children, but bacterial infections cannot be distinguished during clinical observations.[4,21]

Nearly one in five students reported suffering from a sore throat in the previous year with 4.7% infected more than three episodes of infection which is closely correlated with other studies.[18,20,22] The clinical and sub-clinical epidemiology of pharyngitis in our study differed greatly from other nations.[22,23] Several viruses and bacteria can cause acute pharyngitis; however, *Streptococcus pyogenes* is the only etiological agent that has to be concentrated much on the diagnosis and treatment. *S. pyogenes* is of major clinical importance because it can trigger post-infection systemic complications, acute rheumatic fever and post-streptococcal glomerul-onephritis.[24]

The clinical manifestations of bacterial pharyngitis including intense sore throat, fever, chills, malaise, headache, tender enlarged anterior cervical lymph nodes and pharyngeal or tonsillar exudates were largely observed; whereas viral infections gave cough, coryza, conjunctivitis and diarrhea. The differential diagnosis of pharyngitis may be largely useful that contain patient's history and physical examinations. Throat swab microbiology is considered as gold standard for diagnosing streptococcal pharyngitis. However, it has been underused in public health services because of its low availability and because of the 1 to 2-day delay in obtaining results. Rapid antigen detection tests have been used to detect *S. pyogenes* directly from throat swabs within minutes.[25,26]

The World Health Organization (WHO) states that rational use of medicines requires that "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community".[22,27] Also, the Ministry of Health of Indonesia states that use of a drug is said to be rational if it meets the "appropriate diagnosis, indications, drug selection, dosage, route, interval and duration of administration, wary of side effects, precise assessment of the conditions, right of information, proper follow-up and delivery of drugs, allowing to comply to the regimens, as well as the guaranteed of it safety, efficacy, quality and available at any time at an affordable price".[28]

Although acute pharyngitis is one of the most frequent infections seen among school-aged children, GAS pharyngitis accounts for a very small percentage of such cases. The clinical presentations of GAS pharyngitis and non-streptococcal pharyngitis are similar, posing a

challenge to the clinicians in differentiating them without laboratory support.[2,14,29] Thus, laboratory diagnosis of GAS pharyngitis is important for early diagnosis and proper treatment of the disease to prevent the development of complications and to prevent inappropriate administration of antibiotics used for non-streptococcal pharyngitis.[30]

Acute pharyngitis is often a self-limiting disease. Penicillins are the first-choice treatment. For patients with penicillin allergy, cephalosporins can be an acceptable alternative, although primary hypersensitivity to cephalosporins can occur. Another drug option is the macrolides. Future perspectives to prevent streptococcal pharyngitis and post-infection systemic complications include the development of an anti-*Streptococcus pyogenes* vaccine.[24,25]

Till date, no effective vaccine is available against streptococcal diseases, though significant advances have been made on M protein epitope based vaccines. However, these vaccines require multiple amino terminal epitopes that are prevalent in a community so as to provide complete protection. Therefore, the efficacy of currently available vaccines based on N terminal variable region sequence of M proteins found in the western world will be doubtful in developing countries like India.[24]

CONCLUSION

Pharyngitis is common among school children and adolescents. Combining the results of this study with bacteriologic data from other counties, and most of the countries found 400,000 cases annually. Other findings of this study are that parents or guardians appear to have variable knowledge about the frequency of sore throat in their children and tend to report lower frequencies, girls are reported to be affected by pharyngitis more than boys, and management of pharyngitis may be suboptimal for many children (both in terms of percentage of families seeking medical care and type of treatment administered). These results provide important insight into current perceptions and practices related to sore throat in Tiruchirapalli, South India and will be used in the design of public awareness activities aimed at reducing the risk of RHD.

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