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Research Paper

Isolation of Streptococcus species from throat swabs of school going children

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Abstract

Introduction : Group A Streptococcus (Streptococcus pyogenes), is a Gram positive coccus appearing in chains and causes an incredible history of changing disease pattern. It has numerous virulence factors that helps in the adherence of the tissues, destruction of tissues and resulting in causing autoimmune complications. An attempt was made to screen for Streptococcus pyogenes throat carriers among school going children of Udupi district, Karnataka State, India.
Materials and Methods: Throat swabs were collected from posterior pharynx. Swabs were immediately plated onto a sheep blood agar (Hi-Media,Mumbai,India) and transported to the laboratory within one hour of collection. The inoculated plates were incubated at 37^0C for 24- 48 hours in carbondioxide incubator. Organism grown on colonies were identified up to species level.
Result: A total of 235 children were screened for Streptococcus pyogenes. They were in the age group of 6- 11 years. None of the children had Streptococcus pyogenes.
Conclusion: Streptococcus pyogenes was not found from the throat samples in school going children More studies are required to establish an accurate value of prevalence with a larger sample size.

Key words: *Gram positive cocci in chains, Streptococcus pyogenes, school going children, throat swab*

1. Introduction

Group a Streptococcus (Streptococcus pyogenes), is a Gram positive coccus appearing in chains and causes an incredible history of changing disease pattern (Cunningham MW et al, 2000; 13:470–511). It has numerous virulence factors that helps in the adherence of the tissues, destruction of tissues and resulting in causing autoimmune complications (Heath A et al, 1999; 67:5298-305) .Proteomic detection of Streptococcus pyogenes has identified 79 proteins on its surface and 21 cytoplasmic proteins (Severin A et al 2007, 189; 1514-22) .Streptococcal adherence to host pharyngeal epithelium is the basic step in colonization. Environmental conditions, cell density and growth phase are known to influence expression of virulence factors (McIver KS et al 1995; 63; 4540-2 & Chaussee MA et al 2008; 189; 27- 41). High prevalence of rheumatic fever/rheumatic heart disease in India and the association of pharyngitis that ultimately leading to RF/RHD is not studied from this place. Therefore, an attempt was made to screen for Streptococcus pyogenes throat carriers among school going children of Udupi district, Karnataka State, India.

2. Materials and the methods

2.1. Materials

The swabs that were used were prepared as follows. Pre-sterilized wooden sticks were spun with sterile cotton manually. The swabs were sterilized in hot air oven (holding time of 2 hours at 160 °C). The sterility of swabs was ensured by plating randomly selected swabs to Sheep blood agar. No growth was seen after 72 hrs of incubation at 37^0 C.
Consent from the parents was taken for the collection of the throat samples. Exclusion criteria included children whose parents did not give consent to collect the throat sample and children, who did not co-operative for the sample collection. Throat swabs were collected from posterior pharynx as suggested by H. Nsanze, et al; 1998; 260-264). Swabs were immediately plated onto a sheep blood agar (Hi-Media,Mumbai,India) and transported to the laboratory within one hour of collection. The inoculated plates were incubated at 37^0C for 24- 48 hours in carbondioxide incubator at 5% carbondioxide. A bacitracin disc (0.04 units) (Hi Media,Mumbai,India) was placed in the plate directly on the culture plate (Dawson KT et al; 1996,16:123-7) before placing the blood agar plate in the carbon-di-oxide incubator. Colonies were identified for beta haemolysis (Webcls procedure manual 2010).
Gram stain smears were made from the colonies (Hucker's modification). The colonies showing morphology of streptococcus were further identified to species level and production of PYRase was tested. Grouping of Streptococcus was done using Slidex Strepto-Kit (BioMeieux,France) (Koneman et al;2006)

2.2. Results

A total of 235 children were screened for Streptococcus pyogenes. They were in the age group of 6- 11 years. 132 (56.17%) were

male children and 103(43.82%) were female children None of the samples collected from these children showed any growth on sheep blood agar and the prevalence estimated was zero.

Fig 1; Distribution of male and female children

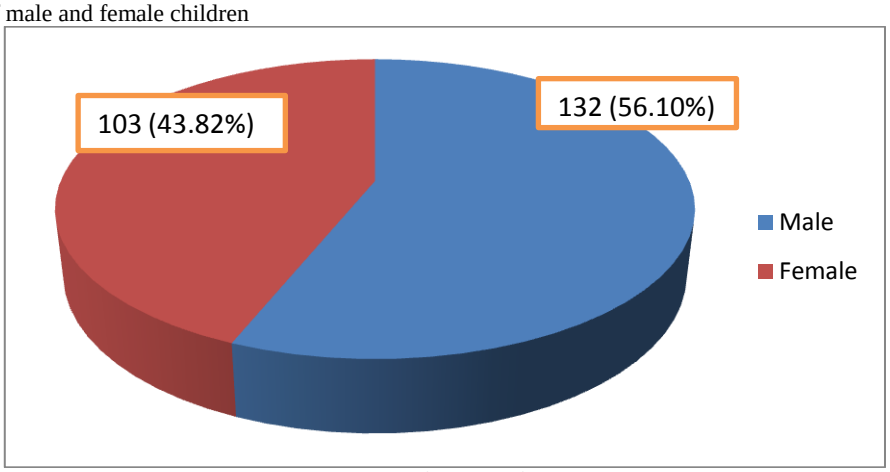

Fig. 1: Distribution of male and female children

Table 1: Age Wise Distribution of Children

Age in Years	Male children	Female children
6-7	35	20
7-8	28	21
8-9	26	23
9-10	20	19
10-11	23	20
Total; 235	132	103

3. Discussion

The surprising finding was that all the screened subjects were negative for the Streptococcus pyogenes throat carriers. A study in India showed 8 of 310 subjects (2%) was throat carriers. The same study also concluded that the prevalence was high with 0.6% prevalence of rheumatic heart disease (Thangam Menon et al 2004; 171-173). In comparison our prevalence was nil in the group studied. The possible reason could be that our study had only healthy students in comparison to their study on subjects who had acute respiratory infections. Axena Haggar et al ;2012 in their study regarding the Streptococcus pyogenes causing invasive spread found that North India had higher incidence than South India.(Kumar R et al;2009) in their study reported in 1.3% of children between the age group of 5- 15 years, again this study was from North India. Our study did not have any case of Streptococcus carriers which indicates that the organism is not found frequently as carriers.

4. Conclusion

We conclude that the prevalence of Streptococcus pyogenes in the school going children in this area of Udupi District is possibly zero. More studies are required to establish an accurate value of prevalence with a larger sample size.

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