A STUDY OF GROUP A STREPTOCOCCAL BACTERIA ISOLATION FROM CHILDREN LESS THAN 12 YEARS WITH ACUTE TONSILLITIS, PHARYNGITIS AND HEALTHY PRIMARY SCHOOL CHILDREN

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Aim: This study was carried out to assess the prevalence of Group A Streptococcal (GAS) bacteria in the throat specimens of children with tonsillitis and pharyngitis compared to healthy children of the same age group.

Methodology: The study was a prospective one. Throat swabs were obtained from 73 children aged 1-12 years diagnosed with acute tonsillitis and pharyngitis (sore throat and pyrexia >38.5°C) visiting a pediatric outpatient clinic between December, 1999 and April, 2000. In the same period throat swabs were obtained from 465

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healthy primary school children aged 6-12 years. GAS from patients was tested for sensitivity to penicillin, erythromycin, and cefaclor.

**Results:** In children with tonsillitis and pharyngitis GAS was found in 29 out of 73 (40%). In healthy school children GAS was found in 15 out of 465 (3%). In the patients group GAS was sensitive to penicillin in 14 (48%), erythromycin in 27 (93%), and cefaclor in 28 (96%).

**Conclusion:** Although the prevalence of GAS among healthy children was similar to international studies, the GAS infection was high among children with acute tonsillitis and pharyngitis. Sensitivity to penicillin was less than 50% and more than 90% for erythromycin and cefaclor. We recommend routine throat swab for children with acute tonsillitis and pharyngitis and the proper treatment of GAS positive patients to prevent further complications.

**Key Words:** Group A streptococcus, tonsillitis, pharyngitis, antibiotic sensitivity, healthy, school children, Saudi Arabia.

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**INTRODUCTION**

Acute tonsillitis and pharyngitis are the most common clinical illnesses produced by group A streptococcus (GAS) bacteria. Untreated patients may develop purulent complications, including otitis media, sinusitis, peritonsillar and retropharyngeal abscesses, and cervical adenitis. The significance of streptococcal respiratory tract infection is related particularly to its acute morbidity and nonsuppurative sequelae, ie, acute rheumatic fever and acute glomerulonephritis. Acute rheumatic fever continues to be a health problem. Reappearance of acute rheumatic fever in several areas serves as a reminder of the importance of continued attention to its prevention in the developed and developing countries. Rheumatic fever in Saudi Arabia occurs in young children and in a form more severe than in the western world. Group A streptococcal infection constitutes 20% to 40% of the causes of tonsillitis and pharyngitis in children. Transmission rate of GAS is approximately 35% within a family or school if the patient is untreated. The carrier rate of GAS is different in the developed and developing countries. Pichichero et al reported a carrier rate of 2.4% among healthy children in the United States. A rate of 13% was reported from India and 21% in Iran. In the gulf region, Dawson et al reported a carrier rate of 11.3% in the children in United Arab Emirates. There is not much literature from Saudi Arabia on the GAS carrier rate or infection. This paper serves as a pilot study of the rate of GAS infection and carrier rate among children less than 12 years old from the same neighbourhood in the city of Makkah, Saudi Arabia.

**METHODOLOGY**

Throat swabs were obtained from 73 children visiting a pediatric outpatient clinic complaining of sore throat and fever of more than 38.5°C and diagnosed as tonsillitis and pharyngitis. The age range of the children was 1 to 12 years (mean age of 7 years). Similarly, swabs were obtained from 465 primary school children whose ages ranged from 6 to 12 years (mean age of 9 years) who lived in the neighborhood of the clinic. The pediatrician and the nurse of the clinic took the swabs of the children attending the clinic. The swabs were put in transport media and sent immediately to the laboratory. A team of specialists and
residents from the Departments of Pediatrics and Microbiology at Umm Al-Qura University-Makkah took the throat swabs from the school children. They were put in transport media, plotted and cultured immediately. The organisms were isolated and identified according to standard laboratory methods. The GAS cultured from patients with tonsillitis and pharyngitis was tested for sensitivity to penicillin G, erythromycin, and cefaclor.

RESULTS
Group A streptococcus bacteria was positive in 29 patients (40%) of children with tonsillitis and pharyngitis. The cultures were positive for GAS in 15 carriers (3%) out of 465 healthy school children (Table 1). GAS in the 29 children with tonsillitis and pharyngitis was sensitive to penicillin G in 14(48%), erythromycin 27(93%), and to cefaclor in 28(96%) (Table 2).

Table 1: Prevalence of GAS among children with tonsillitis, pharyngitis and healthy children.

| Variable                              | No. of GAS positives (%) |
|---------------------------------------|---------------------------|
| Children with tonsillitis and pharyngitis (n=73) | 29 (40)                   |
| Healthy primary school children (n=465)     | 15 (3)                    |

Table 2: GAS sensitivity to antibiotics in patients with tonsillitis and pharyngitis.

| Antibiotics | Sensitivity (%) |
|-------------|-----------------|
| Penicillin G | 14 (48)         |
| Erythromycin| 27 (93)         |
| Cefaclor    | 28 (96)         |

DISCUSSION
This study shows a low carrier rate of GAS in healthy Saudi children compared to studies from some developing and neighboring countries. However, the occurrence of GAS among children with tonsillitis and pharyngitis is 40%. Al-Mazrou from Saudi Arabia reported an increase in the severity and invasiveness of GAS infection. Resurgence of acute rheumatic fever has been reported from different parts of the world. The risk of invasive GAS infection in one study was estimated as 225 times higher in household contact of cases than in the general population. The high rate of GAS infection found in our study raises concern, specially in view of the lack of data of GAS infection and carrier rate in Saudi Arabia. A large study across the Kingdom showed a high prevalence of rheumatic fever of 0.3 per 1000 and the prevalence of chronic rheumatic heart disease of 2.8 per 1000, giving an overall rate of 3.1 per 1000 school children 6-15 years old. The problem is compounded by insufficient data on the sensitivity of GAS to penicillin in Saudi Arabia. Al-Ghamdi et al reported 5.6% resistance of GAS to penicillin in eastern Saudi Arabia. However, resistance to Penicillin has been reported as being as high as 20% while cefuroxime, clarithromycin, and azithromycin are said to provide a better response.

Resistance of more than 50% in our study is a cause for alarm. We recommend routine throat swabs for children with tonsillitis, pharyngitis and high fever and appropriate treatment of GAS positive cases. There is a need for a large-scale study in Saudi Arabia to assess the carrier rate of GAS, its sensitivity to penicillin G, and the magnitude of nonsuppurative sequelae of GAS infection.

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