

Original Research Article

Isolation and Identification of Microorganisms Causing Tonsillitis among Children of Hail Region

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ABSTRACT

Introduction: Tonsillitis is the most common disease in throat that occurs predominantly in the younger age group. The most common cause of acute suppurative tonsillitis include group A β -hemolytic Streptococci.

Objectives: To evaluate the prevalence rate of bacterial tonsillitis among children in hail university nursery and to considered some of the environmental and personal factors that may contribute to spread of infection.

Materials & Methods: This study included 35 children with age ranges from 4 months to 5 years. Throat swabs were collected from each child for bacteriological examination and isolation of the pathogenic bacteria.

Results: Pathogens were detected in 34.2% (12 cases) of the studied cases, *Staphylococcus aureus* was the most commonly grown organism in the collected throat swabs *Staphylococcus aureus* was the most commonly grown organism in throat swabs (6 child out of 35 child), Group A β hemolytic *Streptococci* was isolated from only one patient (2.8%), *E.coli* was detected in throat swabs of 3 patients (8.5%), while *Klebsiella pneumonia* was isolated from 2 patients (5.7%). In conclusion, *Staphylococcus aureus* was the commonest isolated organism in the collected throat swabs.

Conclusion: The current study indicate that, there is a considerable rate of bacterial tonsillitis among children of Hail university Nursery and support the concern that Saudi children may be vulnerable to that infection. Moreover, it show the need to provide health education to children`s mothers in order to prevent primary infection among children.

Keywords: Bacterial tonsillitis, *Staphylococcus aureus*, β hemolytic *Streptococci*, *Klebsiella pneumonia*.

INTRODUCTION

Chronic tonsillitis is the most common disease in throat that occurs predominantly in the younger age group.^[1, 2] The disease is diagnosed mainly by history and clinical examinations. Superficial tonsillar swabs are often used as a guide in identifying the organism and the proper selection of therapy in acute and recurrent tonsillitis. However, their use may lead to incorrect conclusions. Several studies indicate a marked discrepancy in the external and the core tonsillar pathogenic flora.^[3, 4] Tonsillar disease may arise from the bacteria within the substance of the tonsil rather than bacteria identified on the surface. The surface of the tonsils is consistently exposed to oral secretions with their attendant flora. Tonsillar surface culture is likely to grow these organisms.^[5] Several studies concluded that determination of the surface flora was not useful in predicting core bacteria.^[4, 6, 7, 8] The most common cause of acute suppurative tonsillitis include group A β -hemolytic streptococci. About 30% to 40% of tonsillitis cases are caused by Group A β -hemolytic streptococci is documented.^[9]

METHODS

Study group:

A total number of 60 children (49 female and 11 male) attending Hail university nursery in Hail city. The age of the study group ranged from 4 months – 5 years. Forty children have a history of tonsillitis.

Epidemiological assessment:^[10]

A questionnaire sheet was designed to assess some of the main risk factors which may influence the prevalence of bacterial tonsillitis infection among the expecting children. These data were intended to be completed by interviewing each children mother participant during their nursery visit. Followed by home visits to

validate questions related to environmental factors. However, cultural customs made home visits attempts not applicable.

The influential risk factors considered in the study include: children age, mother educational level (primary school only, high school, college; higher education), previous infection by tonsillitis, recurrency of infection. The level of knowledge regarding bacterial tonsillitis and sources of bacterial infection was also evaluated.

Bacterial culture and isolation:^[11]

Samples:

A total number of 35 tonsillar swabs were collected from children (19 female and 16 male) who are enrolled in Hail University Nursery. The age of the children ranged from 4 months – 5 years.

Bacteriological examination:^[11]

Isolation of bacteria:

Tonsillar swabs were cultured on the following media:

i. Sheep blood agar: to show the hemolytic properties of micro-organisms.

ii. MacConkey's agar: for isolation of *Enterobacteriaceae*.

iii. Chocolate agar, containing 0.5 unit /ml. penicillin as a selective media: for inhibiting growth of *Streptococci*, *Neisseriae diphtheroid* bacilli and coagulase negative *Staphylococci* and allow growth of *Haemophilus influenzae*.

-Samples were cultured on these three media were then incubated overnight aerobically at 37°C. The organisms were identified according to the method of Collee JG et.al.^[12]

Identification of the isolates:

i. Microscopical examination:

Smears from the colonies were stained with Gram's stain and examined microscopically. According to Gram Staining reaction, shape and cell

arrangement [13] the isolated microorganisms were divided into:

- 1-Gram positive cocci.
- 2-Gram negative bacilli.

ii. Colonial appearance:

Suspected colonies were described for their appearance, hemolytic activity and morphological characters.

RESULTS

The questionnaire data revealed that 8 (13.3%) of participants have never heard

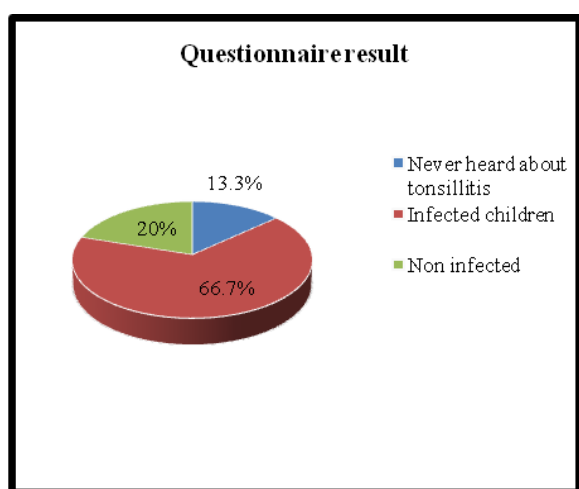


Figure (1): Questionnaire results for prevalence rate of tonsillitis Among children of Hail university nursery.

The culture results of throat swabs regarding to the type of isolated organisms, revealed pathogenic bacteria in 34.2% (12 cases) of the studied cases. Throat swabs revealed growth of normal flora only in 14.2% (5 cases) of studied cases. Throat swab culture yielded commensal growth in 40% (14 cases) of studied cases. Also, culture of throat swab revealed candida albicans in 11.4% (4 cases) of studied cases, as illustrated in Table (1).

DISCUSSION

Bacterial tonsillitis is the commonest disease occurring in younger age group. [1] It is due to inflammation within the tonsils

or seen information about bacterial tonsillitis prior to the interview. In addition all children mothers were unable to identify any of the risk factors associated or complication of the disease.

Also revealed 40 (66.7%) child were infected with tonsillitis which accompanied by increase temperature, pus on tonsils and happen recurrent to infection, while 12 (20%) child not infected before with tonsillitis as illustrated in figure (1).

Organism	Throat swab	Cases yielding that organism	
		Number	%
I-pathogenic			
<i>Staph aureus</i>	+	6	17.1%
<i>B.haemolytic</i>	+	1	2.8%
<i>E.coli</i>	+	3	8.5%
<i>Klebsiella pneumoniae</i>	+	2	5.7%
II-Commensals:			
<i>Nisseria catarrhalis</i>	+	2	5.7%
<i>Viridans streptococci</i>	-	-	-
<i>Streptococcus pnemonae</i>	+	4	11.4%
<i>Coagulase -ve staph</i>	-	-	-
<i>Lactobacillus</i>	+	1	2.8%
<i>Micrococcus</i>	+	2	5.7%
<i>Diphtheroid</i>	+	5	14.2%
III-normal flora			
	+	5	14.2%
IV- other pathogen			
<i>Candida albicans</i>	+	4	11.4%

Table (1): Isolated microorganism from throat swabs.

because of insufficient penetration of antibiotics into the tonsillar core or inappropriate antibiotic therapy. [3]

This study was done primarily to isolate of bacterial causing tonsillitis. Pathogens were detected in 34.2% in throat swabs, these results were near to those of, [3] which revealed pathogens in 55% of throat swabs.

The current study show non reliability of the throat swab in diagnosis of bacterial infection of the tonsils. This was in agreement with, [3, 4] who noted that throat swab in neither a reliable nor valid diagnostic test for representing the growth of the same bacterial flora as the tonsil core.

Microbiological study of throat swab in the current study revealed that *Staph aureus* was the commonest isolate, this was in agreement with the finding of. [10,14]

Group A β hemolytic Streptococci was detected only in one case (2.8%), this was in agreement with [14] stated that the incidence of β hemolytic Streptococcus as the organism responsible for chronic tonsillitis is steadily decreasing over years, where as that of staphylococcus aureus is on gradual increase. However several studies noted that Group A β hemolytic Streptococci was the commonest organism isolated from tonsils. [3]

E.coli and *Klebsiella pneumonia* were isolated from 3 and 2 cases. Several studies isolated *Enterobacteriaceae* from the throat swabs. [3]

CONCLUSION

The role of throat swab in management of bacterial tonsillitis is doubtful. *Staphylococcus aureus* was the commonest isolate from throat swabs.

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