ORIGINAL ARTICLE

THE INCIDENCE OF GROUP A BETA HEMOLYTIC STREPTOCOCCI IN THROAT SPECIMENS FROM UPPER RESPIRATORY INFECTIONS

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Summary: **Objective:** The aim of the study is researching the incidence of group A beta hemolytic streptococci (GABHS) in upper respiratory tract infections in Turkey. **Study design:** This is a descriptive study. **Subject and Methods:** Totally, 3964 throat swabs obtained from patients with upper respiratory tract infections were cultured for isolation of GABHS in Corlu Military Hospital, Department of Microbiology, between April 2002 and April 2004. Standard microbiological techniques were used in the screening. **Results:** In this study, GABHS were isolated from 230 (5.80 %) of 3964 patients. The rate of isolation was 79 (5.65 %)/914 in 2002 year, 103 (5.55 %)/1857 in 2003 year, and 48 (6.77 %)/709 in 2004 year. The rate of isolation was 50 (5.47 %)/914 in the spring, 21 (3.21 %)/642 in the summer, 49 (5.81 %)/844 in the autumn, and 110 (7.03 %)/1564 in the winter. **Conclusion:** We found that the overall incidence of GABHS in respiratory tract infections (5,80 %) was lower than other studies and the incidence was the highest in the winter.

Key words: *Group A beta-hemolytic streptococci; Upper respiratory tract infections; Incidence; Throat culture*

Introduction

Upper respiratory tract infections are the most frequent infectious diseases in humans. Group A beta hemolytic streptococci (GABHS) are the most common etiologic factors of bacterial pharyngitis. Some strains of GABHS can enter respiratory epithelial cells. Delayed or inadequate treatment of streptococcal pharyngitis can cause serious subsequent complications. GABHS causes immune-mediated disorders such as acute rheumatic fever and acute glomerulonephritis (1). A positive culture does not differentiate between acute infection and asymptomatic carriage, although the degree of positivity of the throat culture and clinical symptoms may assist in making this differentiation (1).

The aim of the study is to research the incidence of group GABHS upper respiratory tract infections in the Corlu Military Hospital.

Materials and methods

With Institutional Review Board approval, a total of 3964 throat swabs obtained from patients with upper respiratory tract infections were cultured for isolation of group A beta-hemolytic streptococci in the Corlu Military Hospital, Department of Microbiology, between April 2002 and April 2004. There were 3321 males and 643 females. Informed consent statements were obtained before enrollment. Patients using antibiotic drugs one week previously were excluded.

We were collected a pharyngeal specimen with a cotton swab and Stuart medium (Diomed). Under direct visualization with good illumination, the swab was rubbed over the tonsils, tonsillar fossae, the oropharynx, and the nasopharynx posterior to the uvula. Care was taken to avoid touching the tongue and buccal mucosa. The samples were transported to the laboratory within 2 hours. The throat swabs were inoculated into sheep blood agar. After incubation at 35–37 °C for 18–24 hours, cultures were evaluated for isolation of GABHS on blood agar plates. The isolates of GABHS were grouped using conventional bacitracin tests.

For statistical analyses, an arithmetic mean and X2 test were used and values were chosen as p=0.01 and p=0.05.

Results

The average age for the study population was 26 + 1.25 years. In this study, GABHS were isolated from 230 of the 3964 patients. The overall incidence of GABHS in respiratory tract infections was 5.80 % in Corlu-Turkey. GABHS were isolated from 196 of 3321 (5.90 %) male patients and from 34 of 643 (5.28 %) female patients. There were significant differences in frequency between the seasons (P<0.01). The seasonal incidence of GABHS was 5.47 % in the spring, 3.21 % in the summer, 5.81 % in the autumn, and 7.03 % in the winter. The incidence was the highest in the winter. Additionally, there were significant differences in frequency between 2004 and other years (P<0.01). But there

Tab. 1: Distribution of GABHS by the seasons.

Seasons	2002			2003			2004			OVERALL		
	% (+)	No. (+)	No. Swab	% (+)	No. (+)	No. Swab	% (+)	No. (+)	No. Swab	% (+)	No. (+)	No. Swab
Spring	4.31	5	116	5.50	26	472	5.83	19	326	5.47	50	914
Summer	3.58	11	307	2.99	10	335	–	–	–	3.21	21	642
Autumn	5.46	22	403	6.12	27	441	–	–	–	5.81	49	844
Winter*	7.17	41	572	6.57	40	609	7.57	29	383	7.03	110	1564
TOTAL	5.65	79	1398	5.55	103	1857	6.77	48	709	5.80	230	3964

*The winter includes January, February, and December months.

was no difference for the carrier rates between male (5.90 %) and females (5.28 %), statistically (p>0.05) (Tab. 1).

Discussion

GABHS upper respiratory tract infections may be an important health problem. The incidence of GABHS varies from one population to another. Making the diagnosis of GABHS upper respiratory tract infection is important in the prevention of rheumatic fever. About 1–5 % of untreated GABHS throat infections are followed by ARF acute rheumatic fever (1, 6). The incidence of GABHS upper respiratory tract infection has not been estimated on the basis of population-based data (2).

Differences in frequency may be due to socioeconomic variance, regional varientce, the seasons, and other factors (2–4).

The diagnosis of GABHS can be reliably made with cultures but these results are generally not available for 24–48 hours. Antibiotics should not be prescribed in the absence of laboratory confirmation of GABHS infection (4, 5). The development of rapid antigen tests for GABHS may expedite the diagnosis, allowing some patients to leave the office with the appropriate treatment. However, rapid tests have lower sensitivity than culture (1, 4, 5). Their specificity reaches around 89–99 %, and the sensitivity varies between 77 and 98 %, considering bacterial culture as a "gold standard" parameter (7). In our study, we used the standard throat culture for GABHS isolation. We didn't carry out antibiogramming and MLS (macrolide, lincosamide, streptogramin) resistance testing in our descriptive study due to the fact that performing antibiogramming routinely is not recommended for GABHS that is growing in a throat culture (1).

The infection occurs widely throughout the world with highly variable prevalence. The frequency of GABHS isolations varies between 2–25 % (2–4, 6). Carriers all over the world are a significant source of spreading infection.

In the recent study of Lindbaek et al., GABHS incidence was found as 48 % in patients with upper respiratory tract infection (5).

The low level of GABHS incidence observed in this area contrasts with high rates reported in the literatures (2–6) and the incidence of GABHS was the highest in the winter in our study.

Conclusion

We conclude that the GABHS may be less common causative agents than others for upper respiratory tract infection in the northwest region of Turkey. This is may be due to the characteristics of this region, socioeconomic conditions, antibiotic drug use or other factors.

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