

STUDY CONCERNING THE INCIDENCE OF THE BETA-HEMOLYTIC STREPTOCOCCUS IN THE THROAT SWAB SAMPLES

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Abstract

Streptococci are spherical or oval cocci, nutritionally assertive, Gram positive that form pairs or chains during cell division. They are immobile and non- sporulated, some species have capsule.

They can produce a wide variety of diseases. Streptococcal pharyngitis is the most common infection caused by beta-hemolytic streptococci.

Acute streptococcal infection left untreated can lead to complications such as acute rheumatic fever, acute glomerulonephritis, cardiac complications.

Key words: β - hemolytic streptococcus, pharyngeal secretion

INTRODUCTION

Streptococci are widespread in nature, hosted by man and diverse animals. Some are part of the indigenous microbiota of the respiratory tract, digestive and genital tract; others are associated with important human diseases due to streptococcal infection and partially to the host immune response. (Buiucu D., M. Negut)

Streptococci are spherical or oval cocci, nutritionally assertive, Gram positive that form pairs or chains during cell division. They are immobile and non- sporulated, some species have capsule. They grow well at low pressures of oxygen, some species even in the presence of 5% CO₂. Are catalase and oxidase negatively, most are hemolytic. They decompose glucose with formation of lactic acid and without gas release. (Facklam, R.R., J.A. Washington)

Regarding the current identification of streptococci, the most important criteria of classification are: appearance of hemolysis determined on agar-blood and Lancefield antigenic groups. After hemolysis appearance streptococcus are: β -hemolytic, α -and γ -hemolytic. Depending on the Lancefield classification, streptococci are: group able, A-W groups, except the letters I and J and non group able. (Facklam, R.R)

Streptococci can cause a variety of diseases. Streptococcal pharyngitis is the most common infection caused by beta-hemolytic streptococci. They can cause diseases such as scarlet fever, erysipelas, infectious endocarditis. Acute streptococcal infection left untreated can lead

to complications such as acute rheumatic fever, acute glomerulonephritis, cardiac complications. (Heiter, B.J., P.P. Bourbeau)

MATERIAL AND METHOD

The present study was conducted over two years, 2013-2014, including June, July, August and September. The total number of β hemolytic streptococci found in the four month of each year was registered, the average of the two years being made later, average which was interpreted.

Patients were harvested pharyngeal secretions. Sampling was performed using throat swabs for general use, in the morning, before food intake and toilet of the mouth. The patient was placed facing the light source, with the neck in slight extension and nape against the wall. The base of the tongue was depressed with sterile oppressor, while the patient pronounced the vowel A, with the swab, the tonsils and posterior pharyngeal walls, particularly the inflamed areas, ulcerated and with purulent deposits were firmly wiped.

Both the introduction and removal of throat swab, the touching the base of the tongue or soft palate was avoided. The buffer was reintroduced in the labeled protective tube.

Samples were seeded in the agar blood culture medium and incubated aerobically overnight at 37 ° C. (Turner, J.C., F.G. Hayden et al.)

The 2nd day plates were carefully examined in the light reflected and by transparence chasing small colonies (0.5-1.0 mm diameter), transparent or opaque, surrounded by a wide zone of β -hemolysis. (Facklam, R.R., J.F. Padula et al.)

Selected colonies were tested using Oxoid Streptococcal Grouping Kit- latex agglutination test for identification of the specific group antigen. The kit comprises reagents for groups A, B, C, D, F and G streptococcus.

RESULTS AND DISCUSSIONS

After the latex agglutination test on months tested was identified on average a total of 64 β hemolytic streptococci (str).

In June, were examined 180 throat swabs, 105 from adults, and 75 from children. There were a total of 9 β hemolytic streptococci, 5 at children and 4 at adults.

In July, were examined 256 throat swabs, 148 from adults, and 108 from children. There were a total of 11 β hemolytic streptococci, 6 at children and 5 at adults.

In August, were examined 2263 throat swabs, 154 from adults, and 109 from children. There were a total of 15 β hemolytic streptococci, 8 at children and 7 at adults.

In September, were examined 473 throat swabs, 331 from adults, and 142 from children. There were a total of 29 β hemolytic streptococci, 20 at children and 9 at adults. (table nr1) and (Figure nr.1)

Table 1

Repartition of the number of β hemolytic streptococci according to age, on the studied months

	Total patients with β hemolytic Streptococcus	Adults	Children
June	10	4	5
July	11	5	6
August	15	7	8
September	29	9	20

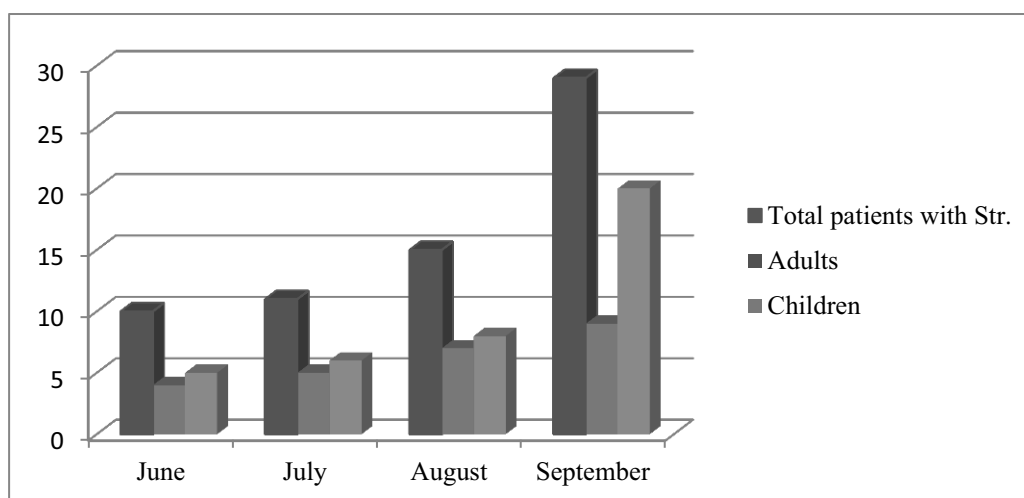


Fig. 1 Repartition of the number of β hemolytic streptococci according to age

Regarding the distribution of β hemolytic streptococci, based on antigenic groups on the four months were recorded:

In June, from the total of 10 β hemolytic streptococci found, 4 were Str. group A, 2 were Str. group B, 1 of group C and 1 of group D. In June there were two combinations, one of Str. group B and Str. group D, and the second of Str. group B and Str. group C.

In July of the 11 β hemolytic streptococci found, 2 have been Str. group A, 4 were Str. group B, 2 of group C, 2 of group D and 1 group G. In July, there weren't registered streptococcal combinations.

In August, from the total of 15 β hemolytic streptococci found, 8 were Str. group A, 4 were Str. group B, 1 of group C and 1 of group D. In August a combination of Str. group B and Str. group D was registered.

In September, from the total of 29 β hemolytic streptococci found, 9 were Str. group A, 7 were Str. group B, 6 of group C, 1 of group D and 6 of group G. In September there weren't registered streptococcal combinations (table nr.2) and (Figure nr. 2).

Table 2

The distribution of β hemolytic streptococci according to the antigenic groups on the studied months

	str.gr. A	str.gr. B	str.gr. C	str.gr. D	str.gr. G	str.gr. B+D	str.gr. B+C
June	4	2	1	1	0	1	1
July	2	4	2	2	1	0	0
August	8	4	1	1	0	1	0
September	9	7	6	1	6	0	0

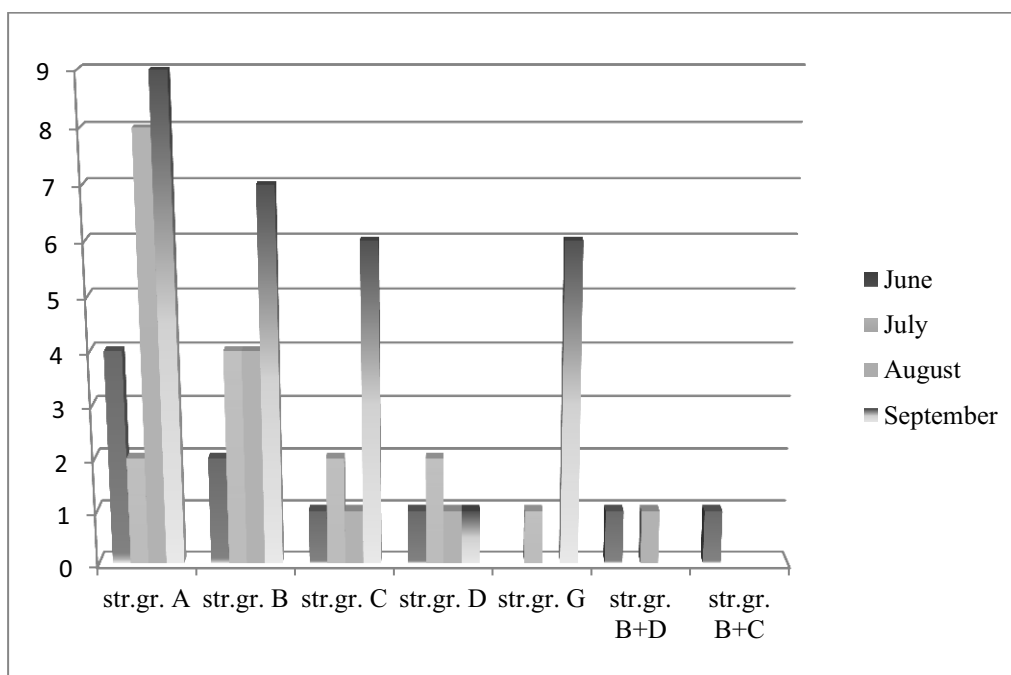


Fig. 2 The distribution of β hemolytic streptococci according to the antigenic groups on the studied months

In some throat swabs, associated to β hemolytic *Streptococcus*, *Staphylococcus aureus* was identified. The number of these associations was relatively small, thus in June, there was no association registered. In July, there was an association of Str group G and *Staphylococcus aureus*. In August, there was an association of Str. group B and *Staphylococcus aureus* and in September, 3 associations of Str. group C, Str. group D, Str. group G and *Staphylococcus aureus*. (table nr.3) and (Figure nr. 3)

Table 3

Associations between β hemolytic *Streptococcus* and *Staphylococcus aureus*

	No. of Str.	No. of assoc. Str. + Staph.
June	10	0
July	11	1
August	15	1
September	29	3

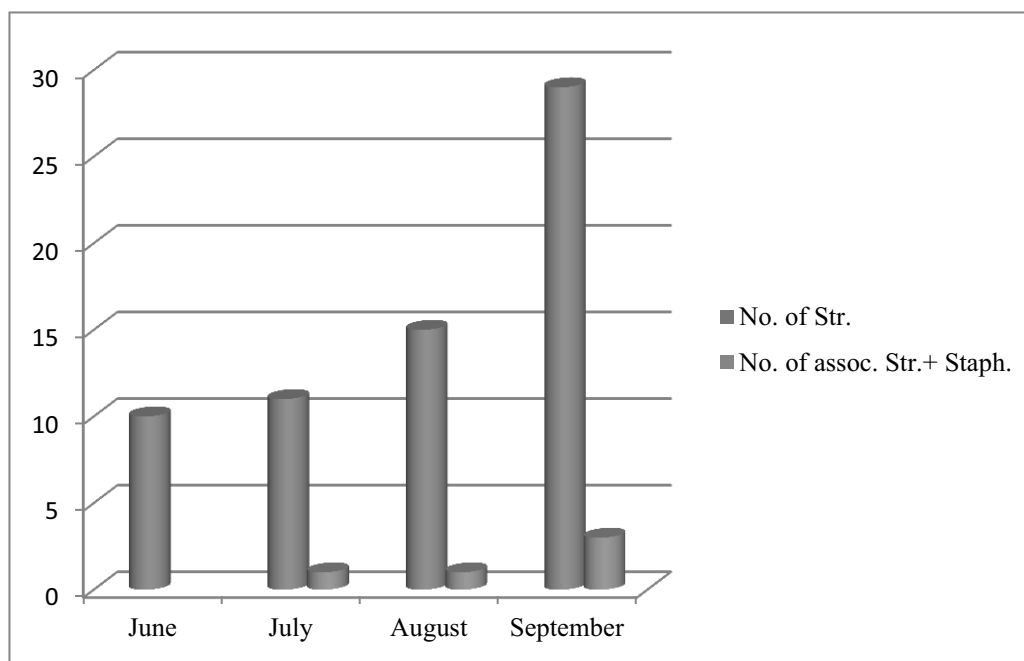


Fig. 3 Associations between β hemolytic Streptococcus and Staphylococcus aureus

For the treatment of streptococcal infections, patients have been given penicillin. Antibigram was conducted on request.

CONCLUSIONS

Detection and proper treatment of infections caused by β -hemolytic streptococcus is extremely important due to complications it may cause, complications such as rheumatic fever, acute glomerulonephritis, cardiac complications.

B-hemolytic streptococcus maintained its sensitivity to penicillin, the treatment of choice for these infections is done with this antibiotic. Antibigram is not usually done. Patients allergic to penicillin are given erythromycin.

The incidence of β -hemolytic Streptococcus in examined throat exudates was 5.4%.

The incidence of β -hemolytic Streptococcus group A was 35.9, from the total of streptococci.

The incidence of β -hemolytic Streptococcus group B was 26.5, from the total of streptococci.

The incidence of β -hemolytic *Streptococcus* group C was 15.6, from the total of streptococci.

The incidence of β -hemolytic *Streptococcus* group D was 7.8, from the total of streptococci.

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