

STREPTOCOCCAL PHARYNGITIS - AN ACTUAL POINT OF VIEW

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Abstract: The infection with *Streptococcus pyogenes* causes acute illness and also poststreptococcal syndromes of acute glomerulonephritis and acute rheumatic fever.

Material and method: Retrospective study of the cases with acute pharyngitis admitted in the Hospital of Infectious Diseases from Iassy in 2010 with a bacteriological and therapeutically analysis.

Results: It registered 1562 patients. 128 patients were diagnosed with streptococcal pharyngitis (by throat culture) and 1434 cases had negative throat. 43 cases of streptococcal pharyngitis and 423 cases of the others had severe clinical form. ASLO titer had high value in 35,3% from tests. In 1394 cases, Penicillin G was preferred; 113 patients were treated with Clarithromycine, 20 with Erythromycine and 35 with Clindamycine.

Conclusions: In patients with symptomatology suggestive for the streptococcal pharyngitis, an etiologically diagnosis should be determined by performing a throat culture or a rapid antigen-detection test before the administration of therapy. The empirical antibiotic treatment on the basis of symptoms alone results in overuse of antibiotics, increased costs, and an increased rate of side effects from antibiotics. Penicillin is the preferred treatment.

Key words: group a streptococcus, throat culture, penicillin, poststreptococcal syndrome.

INTRODUCTION

Group A streptococcus (*Streptococcus pyogenes*) is responsible for 5 -15% of pharyngitis in adults and 20 - 30% in children.(1) The illness occurs most commonly among children between 5 and 15 years of age. The infection not only causes acute illness but also can trigger the poststreptococcal syndromes of acute glomerulonephritis and acute rheumatic fever.

MATERIAL AND METHOD

A retrospective study was performed using bacteriological and therapeutically data to the patients with acute pharyngitis admitted in the Hospital of Infectious Diseases from Iassy in 2010.

RESULTS

The authors registered 1562 patients admitted with acute pharyngitis. 128 patients (8,2%) were diagnosed with streptococcal pharyngitis (by throat culture) and the others (1434 cases, 91,8%) had negative throat culture (erythematous pharyngitis – 627 cases and pultaceous tonsillitis – 807 cases). 43 cases (33,6% of streptococcal pharyngitis) and 423 cases (29,5% of the others) had severe clinical form, necessitating hospitalization. (fig.) ASLO titer were performed in 578 cases (37%) with high value in 204 cases (35,3% from tests). All the patients were treated with antibiotics. In 1394 cases (89,2%), Penicillin G was preferred, followed by benzathine penicillin; 113 patients (7,2%) were treated with Clarithromycine, 20 (1,3%) with

Erythromycine and 35 (2,2%) with Clindamycine.

DISCUSSIONS

A little percent of all the cases with acute pharyngitis had a positive throat culture. The majority of cases were managed in ambulatory system (without severity signs). The clinical aspects in streptococcal pharyngitis include throat pain associated to fever, chills, malaise or headache with abrupt onset. Particularly in younger children, the abdominal pain and digestive intolerance may be present. (2) A papular erythematous rash suggests scarlet

fever. Other associated symptoms like cough, coryza or conjunctivitis may suggest an alternative cause such as a viral infection.

The diagnosis of streptococcal pharyngitis on clinical findings is notoriously unreliable. (3, 4) The variability of symptomatology and the severity degree from mild throat discomfort alone to classic exudative pharyngitis with high fever and prostration are difficulties in diagnosis. This is further complicated by the enlarged spectrum of infectious etiology in acute pharyngitis. (Table I) (5)

Table I – Infectious causes of acute pharyngitis

Infectious agent	Clinical syndrome
Viruses	
Rhinovirus	Common cold
Coronavirus	Common cold
Adenovirus	Pharyngoconjunctival fever
Influenza virus	Influenza
Parainfluenza virus	Common cold, croup
Coxsackie virus	Herpangina, hand-foot-mouth disease
Herpes virus	
- herpes simplex virus	Gingivostomatitis
- Epstein-Barr virus	Infectious mononucleosis
- cytomegalovirus	Mononucleosis-like syndrome
Human immunodeficiency virus	Acute (primary) infection syndrome
Bacteria	
Group A streptococci	Pharyngitis, scarlet fever
Group C or G streptococci	Pharyngitis
Mixed anaerobes	Vincent's angina (necrotizing gingivostomatitis)
<i>Fusobacterium necrophorum</i>	Lemierre's syndrome (septic thrombophlebitis of internal jugular vein)
<i>Arcanobacterium haemolyticum</i>	Pharyngitis, scarlatiniform rash
<i>Neisseria gonorrhoeae</i>	Pharyngitis
<i>Treponema pallidum</i>	Secondary syphilis
<i>Francisella tularensis</i>	Pharyngeal tularemia

<i>Corynebacterium diphtheriae</i>	Diphtheria
<i>Yersinia enterocolitica</i>	Pharyngitis, enterocolitis
<i>Yersinia pestis</i>	Plague
<i>Mycoplasma pneumoniae</i>	Bronchitis, pneumonia
<i>Chlamydophila pneumoniae</i>	Bronchitis, pneumonia
<i>Chlamydophila psittaci</i>	Psittacosis

Clinical scoring systems have been developed to predict the likelihood of streptococcal infection in sore throat. These systems are based on assessment for suggestive clinical features: fever, tonsillar swelling or exudate, tender and enlarged anterior cervical lymph nodes and the

absence of cough. The probability of positive results of a throat culture or a rapid antigen-detection test ranges from 3% or less in patients with no suggestive clinical criteria to approximately 30-50% in those with all of them. (Table II) (5, 6)

Table II – Clinical scoring system and likelihood of positive throat culture for group A streptococcal pharyngitis

Clinical criteria	Points *
Fever (temperature > 38°C)	1
Absence of cough	1
Swollen, tender anterior cervical nodes	1
Tonsillar swelling or exudate	1
Age	
3 – 15 years	1
15 – 45 years	0
≥ 45 years	-1

*A score of 0 or negative score is associated with a risk of 1 – 2,5%, 1 point is associated with a risk of 5 – 10%, 2 points is associated with a risk of 11 – 17%, 3 points is associated with a risk of 28 – 35% and 4 or more points is associated with a risk of 51 – 53%.

Another aspect in deciding whether to perform a throat culture or rapid antigen-detection test is the fact that certain persons are asymptomatic carriers of *S. pyogenes*. In the absence of suggestive clinical features, a positive culture or rapid antigen-detection test is likely to reflect incidental carriage of *S. pyogenes*. (7)

Considering that the presentation is not specific, the laboratory diagnosis of

streptococcal pharyngitis should be based on the results of a specific test to detect the presence of the microbe: a throat culture or a rapid antigen-detection test of a throat-swab specimen. Swabbing the posterior pharynx and tonsils and not the tongue, lips or oral mucosa increases the sensitivity of both the culture and rapid antigen-detection test. The rapid antigen-detection tests are based on acid extraction

of cell-wall carbohydrate antigen and detection of the antigen with the use of a specific antibody. An alternative approach is the rapid identification of *S. pyogenes*-specific DNA sequences by means of hybridization with a DNA probe or by means of a real-time polymerase-chain-reaction assay. The specificity of rapid antigen-detection tests is 95% or more and thus, a positive result can be considered to be definitive. Considering the low sensitivity, the most guidelines recommend a throat culture if the result is negative. (5)

In our study, there are 35,3% of tested cases with high ASLO titer. The serological tests of measurement of antibodies to streptolysin O or DNase B are useful for retrospective diagnosis to provide support for the poststreptococcal syndromes, but are not helpful in the monitoring of pharyngitis, since titers increase from the 7th to 14th day from the onset, reaching a peak in 3 to 4 weeks.

In our analysis, the preferred therapy was Penicillin G followed by Clarithromycine, Clindamycine and Erythromycine. In literature, the therapeutically objectives include the prevention of the poststreptococcal syndromes and suppurative complications. A meta-analysis showed that administration of various regimens of intramuscular penicillin was associated with an 80% reduction in the incidence of acute rheumatic fever, as compared with no antibiotic treatment (relative risk, 0.20; 95% confidence interval [CI], 0.11 to 0.36). (8) Another study showed that

antibiotic therapy significantly reduced the risks of acute otitis media (in 11 studies; relative risk, 0.30; 95% CI, 0.15 to 0.58) and peritonsillar abscess (in 8 studies; relative risk, 0.15; 95% CI, 0.05 to 0.47). (9)

If in the 1950s -1960s, the most compelling reason for antibiotic therapy was to prevent acute rheumatic fever which resulted in dramatically decline in its incidence, today, several decision analyses compare the cost-effectiveness of various strategies for diagnosis and treatment. There are four actual strategies which include antibiotic treatment based on the results of a throat culture, no treatment, treatment of all patients with symptoms, treatment based on the results of a rapid antigen-detection test alone, treatment based on the results of a rapid antigen-detection test plus culture in patients with a negative rapid antigen-detection test, and treatment based on an algorithm of signs and symptoms alone or in combination with the selective use of culture, rapid antigen-detection test, or both. For exemple, an analysis of four strategies for the management of pharyngitis in children (treatment of all patients with symptoms, rapid antigen-detection test alone, culture alone, or rapid antigen-detection test plus culture) concluded that a rapid antigen-detection test plus culture was most cost-effective when the costs of managing complications of streptococcal infection and treatment were included. (10) Recommended treatment regimens are summarized in table III (5, 11)

Table III – Recommended treatment regimens for group A streptococcal pharyngitis

Drug	Dose, route, duration
Penicillin V	Weight <27 kg: 250 mg two or three times/day for 10 days Weight ≥27 kg: 500 mg two or three times/day for 10 days
Benzathine penicillin	Weight <27 kg: 600 000 units as a single dose Weight ≥27 kg: 1 200 000 units as a single dose
Amoxicillin	20 mg/kg/dose orally twice a day to maximum of 500 mg/dose for 10 days or 50 mg/kg once a day to maximum of 1 g once a day for 10 days
Alternatives for penicillin allergy	20 mg/kg/dose orally twice a day to max of 500 mg/dose for 10 days
Cephalexine	30 mg/kg orally once a day to max of 1 g once a day for 10 days
Cefadroxil	30 mg/kg orally once a day to max of 1 g once a day for 10 days
Azithromycine	12 mg/kg orally once a day to max of 500 mg/dose for 5 days
Clindamycine	7 mg/kg/dose orally three times a day to max of 300 mg/dose for 10 days
Clarithromycine	7,5 mg/kg/dose orally twice a day for 10 days

There are some areas of uncertainty. Several articles have suggested that bacteriologic cure rates associated with penicillin treatment of streptococcal pharyngitis have decreased in recent decades and that cephalosporins are more efficacious. (12) Several explanations were proposed in the case of the failure of penicillin treatment, but there aren't disponible data to provide this. Potential mechanisms include local degradation of penicillin by beta-lactamases produced by other throat flora and the inhibitory effect of penicillin on competing flora.

There is no evidence that *S. pyogenes* has become more resistant to penicillin. Recommendations for the management of streptococcal pharyngitis have been published by the American College of Physicians (ACP), the American Academy

of Family Physicians (AAFP), and the Centers for Disease Control and Prevention (CDC); the Infectious Diseases Society of America (IDSA); and the American Heart Association–American Academy of Pediatrics (AHA). All these American guidelines consider that it is not reasonable to perform a throat culture or rapid antigen-detection test in persons who have none of the clinical features suggestive of streptococcal infection. (5) In the same time, these recommend penicillin orally or intramuscularly as the preferred therapy. The AHA recommends a first-generation cephalosporin in patients with penicillin allergy who do not have immediate hypersensitivity to beta-lactam antibiotics, with clindamycine, azithromycine or clarithromycine as an alternative treatment option. The others

recommend the use of erythromycin in patients who are allergic to penicillin. Guidelines in some European countries are consistent with these approaches, whereas other European guidelines consider streptococcal pharyngitis to be a self-limited illness that does not require a specific diagnosis or antibiotic treatment except in high-risk patients (i.e., those with a history of acute rheumatic fever or rheumatic heart disease) or severely ill patients. (5, 13)

CONCLUSIONS

In patients with symptomatology suggestive for the streptococcal pharyngitis, an etiologically diagnosis should be determined by performing a throat culture or a rapid antigen-detection test before the administration of therapy. The empirical antibiotic treatment on the basis of symptoms alone results in overuse of antibiotics, increased costs, and an increased rate of side effects from antibiotics. Penicillin is the preferred treatment and the patients with penicillin allergy need a particular attention.

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