

ANTIBIOTICS PRESCRIBED BY GENERAL PRACTITIONERS TO TREAT SORE THROAT IN CHILDREN

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Abstract

The purpose of our study was to evaluate whether general practitioners (GPs) select correct medication and duration of antibiotic therapy for streptococcal pharyngitis in children, and to identify ways to improve their decision-making process. We conducted a survey among GPs addressing their treatment strategies for pharyngitis in children and prescription of antibiotic therapy for streptococcal pharyngitis. The study involved GPs of Ternopil region, Ukraine. In total, 60 GPs working at primary care hospitals were surveyed. The age of surveyed GPs ranged from 24 to 78 years. The majority of the respondents were women, 58 (96.6%). Their practical medical experience ranged from 1 to 55 years. The respondents prescribed antibiotic therapy to treat pharyngitis in some cases in 86.7%. Amoxicillin was preferred as the first choice antibiotic by 38.3% of those prescribing antibiotic therapy. However, a large number of physicians (35.0%) chose a second-line antibiotic (amoxicillin/clavulanate) and 6.6% of GPs chose third-generation cephalosporins (such as ceftriaxone or cefotaxime). Only 10.0% of those prescribing antibiotic therapy chose a correct duration of antibiotic therapy of 10 days. The results of the study showed a wide variation in the knowledge by general practitioners about appropriate strategies in prescribing antibiotics for the treatment of a sore throat in children. These results underscore the need to improve awareness of general practitioners about correct management of patients with acute pharyngitis.

Key words: *beta hemolytic streptococci group A1, pharyngitis², antibiotic³, treatment⁴.*

Introduction

Beta hemolytic streptococci group A (GAS) is the most common cause of bacterial pharyngitis [1, 2] and its treatment requires antibiotic therapy. However, bacteria are the cause of sore throat in only 20.0-30.0% of children and 5.0-15.0% of adults [3, 4]. In other cases, acute pharyngitis is of a viral etiology and does not require antibiotic therapy.

The issue of whether the treatment of a patient with a sore throat requires antibacterial drugs, is germane and disputed, because uncontrolled antibiotic use increases antimicrobial resistance, destroys normal microflora, increases the risk of adverse reactions and increases treatment costs [4, 5]. On the other hand, inappropriate treatment of GAS pharyngitis can result in the development of acute rheumatic fever or other complications [2, 6-7].

The need for antibiotics in patients with an acute sore throat is determined by the FeverPAIN or Centor criteria (fever/pain, Centor score, adjusted by Mclsaak). Microbiological testing is performed only after assessing the patient's condition on Centor, Mclsaak scale and involves the use of a rapid test and / or culture [5, 7, 9, 10, 11]. Pharyngitis caused by GAS is the only case of acute pharyngitis when antibiotics are clearly indicated. Antibiotic therapy eradicates the pathogen, reduces the severity and duration of clinical manifestations of infection, and prevents the development of post-streptococcal complications and spread of infection. Rational antibiotic therapy for streptococcal pharyngitis is necessary to prevent acute rheumatic fever, purulent complications, swiftly reduce contagiousness, prevent transmission of the infection to family members and others in close contact with the patient, as well as to minimize the potential side effects. Undiagnosed or inadequately treated streptococcal pharyngitis can lead to purulent and non-purulent systemic complications [1, 8, 12, 13, 14].

Despite existing clinical guidelines for the administration of antibiotics in children and adults with streptococcal pharyngitis, a large number of patients continue to receive inadequate antimicrobial therapy. There are several reasons for this. First, all forms of pharyngitis have shared clinical picture so it is difficult to produce an

etiological diagnosis following the initial examination of the patient [4, 15-19]. Second, with the exception of very rare infections caused by some bacterial pathogens, the effectiveness of antimicrobial therapy has not been proven for acute non-streptococcal pharyngitis [3, 5, 18, 20]. That is why it is extremely important to exclude the diagnosis of acute streptococcal pharyngitis to prevent inappropriate antibiotics use, allergic reactions, drug side effects and antibiotic resistance [21-22].

The purpose of our study was to evaluate whether general practitioners select correct medication and duration of antibiotic therapy for streptococcal pharyngitis in children, and to identify ways to improve their decision-making process.

Methods

We administered a survey to general practitioners to assess treatment strategies for pharyngitis in children, prescription of antibiotic therapy for streptococcal pharyngitis. The survey was administered in September and October 2021 in Ternopil region of Ukraine. The questionnaires were delivered to their work place during work hours. A total of 60 general practitioners participated in the survey.

The questionnaires included general questions (participant's age, gender, place of work, and medical experience) as well as questions about their strategies to treat streptococcal pharyngitis in children.

Informed consent was obtained before administering the survey. Participants acknowledged that their participation was voluntary. Participants were informed about the reasons the information was collected, how it would be used, and that their responses were anonymous and confidential. The study design and execution adhered to the Declaration of Helsinki. The study protocol was approved by the Science Ethics committee of I.Horbachevsky Ternopil National Medical University.

Statistical analysis was carried out using standard descriptive statistics tests (mean, SD), using MS Excel (Microsoft, USA) and STATISTICA 6.0 (StatSoft, USA) software.

Results

General practitioners participating in the survey were 24 to 78 years old (mean age 45.7 ± 12.5 years). The majority of the respondents were women, 58 (96.6%). Their practical medical experience ranged from 1 to 55 years (average duration of practical experience 20.1 ± 12.1 years). The list of questions and answers of all respondents is given below (Table 1).

Antibiotic therapy for the treatment of pharyngitis was always used by 8.3% of the respondents, in some cases by 86.7%, and never by 5.0% of the respondents. The majority of those prescribing antibiotic therapy prescribed penicillin/aminopenicillin antibiotics, including in combination with a beta lactamase inhibitor sulbactam or clavulonate (83.2%). Amoxicillin was selected as the first choice antibiotic by 38.3% of those prescribing antibiotic therapy. However, a large number of physicians (35.0%) chose a second-line antibiotic (amoxicillin/clavulanate) and 6.6% of general practitioners chose third-generation cephalosporins (ceftriaxox, cefotaxime). Only 10.0% of those prescribing antibiotic therapy selected its correct duration for 10 days, 50.0% prescribed the therapy for 7 days, 31.7% - for 5 days, and 3.3% - for 3 days. The majority of those prescribing antibiotic therapy (85.0%) replied that they would correct antibiotic course depending on streptococcal antibiotic sensitivity, an incorrect answer and only 15.0% gave a correct answer to this question.

Discussion

GAS is known to be fully sensitive to β -lactam antibiotics; no resistant strain has been yet isolated. The drugs of choice for the treatment of streptococcal pharyngitis are penicillin group drugs. Cephalosporins and combined aminopenicillins should be used judiciously, only for recurrent cases or complicated course. For the patients allergic to β -lactam antibiotics it is recommended to prescribe macrolides [4, 7, 16]. Combined penicillins and 3rd generation cephalosporins should be used only in cases of recurrent pharyngitis or its complications [8, 10]. Our study showed that when prescribing antibiotic therapy, most general practitioners chose amoxicillin as the first-line antibiotic (38.3%). This

proportion is similar to other studies which show that amoxicillin was used to treat streptococcal pharyngitis in 34.0-53.0% of cases [15, 18]. GPs often also chose amoxicillin/clavulanate (35.0%). A study from Italy similarly demonstrated that primary care physicians give a preference (55.0%) to prescribing amoxicillin and clavulanate [15]. Only a small percentage of general practitioners (3.3%) in our study indicated that they prescribe macrolides. This group of antibiotics, in particular azithromycin, was demonstrated to be effective for the treatment of pharyngitis [4]. However, there is a high the level of streptococcal resistance to macrolides [20].

A very small number of those prescribing antibiotic therapy (10.0%) gave the correct answer about the duration of antibiotic therapy, 10 days. The majority recommended shorter courses of antibiotic therapy: 3 days (3.3%), 5 days (31.7%) or 7 days (50.0%). This is in contrast to 88.0% of primary care physicians in Italy recommending a 10-day course of treatment for streptococcal pharyngitis [15].

Our previous study among primary care pediatricians showed their better familiarity with the correct treatment protocol: amoxicillin as a first-line antibiotic was prescribed in 75.9% of the cases, and in 55.7% of cases the duration of antibacterial therapy was 10 days [23]. Overall, 87.3% of pediatricians used antibiotic therapy to treat pharyngitis in some cases, which is comparable to the results of the present survey of general practitioners.

High sensitivity of GAS to β -lactams does not require antibiotic susceptibility testing, but 85.0% of GPs prescribing antibiotic therapy supported susceptibility testing and treatment correction.

Thus, our study shows that antibiotic therapy for pharyngitis in children is not routinely prescribed, and following appropriate indications, 46.7% of general practitioners prescribe first-line antibiotics. However, there is a lack of knowledge about the recommended duration of antibacterial therapy for streptococcal pharyngitis.

A limitation of the study is that it relied only on self-reported answers by the respondents, which may differ from their actual prescriptions.

As GAS remain an important cause of morbidity and mortality world-wide, and especially in developing countries, raising awareness among

physicians is important for control of diseases caused by this group of pathogens. Educational programs have shown their effectiveness to improve diagnosis and treatment of other diseases [24-25].

The results of the study showed a wide divergence of knowledge among general practitioners about prescribing antibiotics for the treatment of a sore throat in children. Satisfactory knowledge was demonstrated concerning the choice of antibacterial therapy, but low knowledge was shown concerning its duration. These results underscore the need to improve the awareness of general practitioners about recommended management options for the patients with acute pharyngitis.

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Table 1. Distribution of survey answers by general practitioners (n = 60)

	Question	General practitioners, n= 60	
		n	%
1.	<i>Do you use antibiotic therapy to treat pharyngitis?</i>		
	Yes, always	5	8.3
	Yes, in some cases	52	86.7
	No, never	3	5.0
2.	<i>Which antibiotic do you use to treat GAS pharyngitis?</i> <i>Only one option can be selected.</i>		
	Penicillin	2	3.3
	Ampicillin	3	5.0
	Amoxicillin	23	38.3
	Amoxicillin/clavulanate	21	35.0
	Ampicillin/sulbactam	1	1.6
	Azithromycin	1	1.6
	Clarithromycin	1	1.6
	Ceftriaxon	3	5.0
	Cefotaxime	1	1.6
Cephalexin	1	1.6	
3.	<i>For how many days do you prescribe antibiotic therapy to treat GAS pharyngitis?</i>		
	3 days	2	3.3
	5 days	19	31.7
	7 days	30	50.0
	10 days	6	10.0
	14 days	-	-
4.	<i>Do you provide antibiotic correction depends on antibiotic susceptibility?</i>		
	Yes	51	85.0
	No	9	15.0