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Research Article

Investigating Pediatric Pharyngitis Management Approaches Among Family Physicians: A Comprehensive Study

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A B S T R A C T

A study involving 120 general practitioners found that 90% of them emphasized the importance of distinguishing between viral and bacterial origins for effective management of pharyngitis in children. However, only 3% advocated for systematic antibiotic therapy and 8% had previously used rapid diagnostic tests (RDTs). Integrating RDTs into routine assessments could improve diagnostic precision and optimize therapeutic decisions in paediatric pharyngitis management, mitigating antibiotic resistance and minimizing complications.

Keywords: Pharyngitis, Pediatrics, Group A beta hemolytic streptococcus (GAS)

Introduction

Childhood pharyngitis poses a significant global public health challenge, with over a billion cases reported annually in children worldwide, leading to substantial healthcare utilization and antibiotic consumption.[1] Viral pharyngitis typically resolves spontaneously within a few days, whereas group A hemolytic beta streptococcus (GAS) pharyngitis can result in severe suppurative and non-suppurative complications, including acute rheumatic arthritis (ARA).[2,3] The persistence of ARA in developing countries is often attributed to inappropriate pharyngitis management, presenting diagnostic and therapeutic challenges due to its frequency and associated morbidity, necessitating extensive medical intervention and substantial healthcare expenditures.[4]

Effectively addressing childhood pharyngitis requires accurate differentiation between cases linked to GAS and those of viral origin to minimize unnecessary antibiotic exposure for children.[5] The chosen diagnostic strategy must strike a balance, being sufficiently sensitive to avoid false negatives that may lead to complications, and specific enough to prevent false positives that could contribute to antibiotic resistance and incur unnecessary healthcare costs.[6,7]. Currently, pharyngitis is routinely treated with

beta-lactams or macrolides, particularly in cases of penicillin allergy, as the sensitivity of GAS to amino-penicillin remains consistently high in vitro. The objective of our study is to assess, through a survey, the diagnostic and therapeutic practices of general practitioners and identify any disparities between these practices and national and international recommendations.

Materials and Methods

The purpose of this 3-month prospective, descriptive, cross-sectional study of general practitioners in Rabat and Temara, Morocco, is to evaluate the diagnostic and treatment practices for pediatric pharyngitis. The study will take place from september 10 to December 10 , 2020.The email addresses on file received the questionnaire electronically. It includes details on what is meant by pharyngitis, how to diagnose it, whether or not to separate bacterial from viral pharyngitis, clinical symptoms that indicate bacterial pharyngitis, how to treat it, what kind of antibiotic to use, and the benefits of antibiotic therapy.After then, the data was downloaded and examined using an Excel spreadsheet.

Results and Discussion

Pharyngitis refers to the acute inflammation of the pharynx and/or tonsils. Traditionally, French terminology distinguishes between angina (with tonsillitis) and pharyngitis (without tonsillitis), while Anglo-Saxons use the generic term pharyngitis without making such distinctions. In our survey, 91% of participating doctors defined pharyngitis as inflammation of the pharynx, while 4% specifically associated it with tonsillitis. A similar study in Tunisia found that 15% of general practitioners faced challenges due to the multitude of synonyms used in medical training, literature, and hospital contexts, leading each practitioner to formulate their own definition of pharyngitis. Therefore, the development of evidence-based best practice recommendations should be accompanied by a clear, operational definition of clinical situations.[8,9,2]

The majority of pharyngitis cases are of viral origin (60-90%). Commonly implicated viruses include adenovirus, Influenzae virus, respiratory syncytial virus, and parainfluenzae virus (Table I). GAS pharyngitis constitutes the most prevalent bacterial form (20%), typically occurring from the age of 3 years, with the highest incidence observed in children aged 5 to 15 years. In infants and children under 3 years, pharyngitis is generally viral, and streptococcus is rarely implicated. Other beta-hemolytic streptococci, particularly C and G, may be involved but less frequently.[4,8]

The clinical manifestations of pharyngitis include a sore throat, fever, headache, cervical adenopathy or lymphadenitis, and sometimes abdominal pain, nausea, vomiting, fatigue, or rash. When GAS is the causative agent, tonsil exudates are common, fever often exceeds 38.5 °C, and may be associated with chills and myalgia.[9,10]

In our research, 90% of physicians found the distinction valuable, with 80% of surveyed doctors explicitly identifying fever as a key criterion for bacterial pharyngitis, followed by cervical adenopathies at 58%. Only 28% of doctors considered the patient's age as a significant factor in diagnosing bacterial pharyngitis. An additional 24% of doctors highlighted other crucial clinical signs supporting bacterial pharyngitis, including impaired general condition, duration of progression, purulent discharge, and the absence of cold symptoms (Figure 1).

Table I: Bacterial and viral agents associated with pharyngitis.[1]

Bacteria	Virus
PyogenicStreptococci	*Adenovirus*
StreptococciequisspequisimilisStreptococciequisspzooepidzmicus	*Epstein-Barr virus*
Group G hemolytic Streptococcus B	*Herpes simplex 1 et 2*
ArcanobacteriumhaemolyticumMycoplasmapneumoniae	*Enterovirus*
Chlamydia pneumoniae	*Rhinovirus*
Corynebacteriumdiphteriae	*Influenza A et B*
Corynebacteriumulcerans	*virus Parainfluenzae*
Yersinia enterocolitica	*Coronavirus*
Yersinia pestis	*Human immunodeficiency virus*
Treponemapallidurn	

Table I: Clinical scores for the diagnosis of streptococcal pharyngitis A.

Anthors	Clinical signs	Score if present	Score if absent Bacteria
Breese et a[11]	Season	1-4	
	Age of	1-4	
	White blood cell	1-6	
	count	4	2
	Fever > 38.50	4	2
	Sore throat	4	2
	Headache	4	2
	Abnormal mouth	4	2
	Cervical adenopathy	2	4
Centor et al [12]	Exudate	1	0
	Cervical adenopathy of the anterior	1	0
	Cough	0	1
		1	0
Wald et al	Age (5-15 years)	1	0

The diagnosis of pharyngitis was primarily established clinically by 98% of the interviewed doctors, with only 2% reporting the use of additional examinations alongside clinical judgment. This is attributed to the clinical nature of pharyngitis diagnosis and the limited means available for isolating the causative microorganism. Doctors expressed concerns about potentially missing a Group A Streptococcus (SAG) pharyngitis, which they considered endemic in Morocco and linked to serious complications such as heart attacks and the risk of secondary valvular disease.

It is crucial to differentiate bacterial pharyngitis from viral pharyngitis to prevent post-streptococcal complications, reduce the economic burden of systematic antibiotic therapy, and help mitigate bacterial resistance. However, distinguishing between viral and bacterial pharyngitis poses clinical challenges, as no single functional or physical criterion for acute pharyngitis is entirely discriminatory. Combining multiple clinical criteria such as exudate, previous cervical adenopathies, absence of cough, and the presence of fever can aid practitioners in predicting but not definitively confirming the streptococcal origin of pharyngitis. Conversely, symptoms indicative of viral pharyngitis include the absence of fever, cough, hoarseness,

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conjunctivitis, diarrhea, and the presence of vesicles or stomatitis.[9,10].

In the literature, various authors have proposed clinical scores to assist general practitioners in deciding on antibiotic therapy in cases with a high suspicion of bacterial GAS pharyngitis (Table II). These clinical scores categorize patients into three groups at risk of SGA: low-risk patients receive only symptomatic treatment, those at intermediate risk undergo additional diagnostic testing (bacteriological testing) and receive antibiotic treatment if the test is positive, and high-risk patients receive empirical antibiotic treatment. This strategy proves efficient, limiting antibiotic prescriptions for streptococcal pharyngitis.[11-17]

Anthors	Clinical signs	Score if present	Score if absent Bacteria
[13]	Season (November-May) Fever	1	0
	38.30c	1	0
	Anterior cervical	1	0
	Adenopathy	1	0
	Erythema, hypertrophy, exudate amygdala	0	1
	Signs of high respiratory infections		
Mc Isaac et al [14]	Temperature > 38oC	1	0
	Cough	0	1
	Cervical adenopathy of the anterior	1	0
	Hypertrophied or exudated	1	0
	amygdala	1	0
	Age: 3 to 14 years	0	0
	Age: 15 years	-1	0
	Age > 45 years		
Abu Reesh et al.[15]	Exudate or cervical adenopathy	1	0
Steinhoff et al[16]	Cervical adenopathy	1	0
	Skin rash	0	1
	rhinitis	0	1
OMS [17]	Exudate and cervical adenopathy	1	0

The definitive diagnosis of streptococcal origin relies on bacteriological confirmation tests, namely Rapid Diagnostic Tests (RDTs) and bacterial culture. RDTs, employed in medical settings, identify the presence of S. pyogenes in throat samples by detecting an antigen specific to the bacterial wall of streptococcus (M protein). These tests exhibit a sensitivity exceeding 90% and a specificity ranging from 80 to 98%, depending on the materials used.

Although bacterial culture is the reference microbiological method, boasting a sensitivity of 90 to 95%, it has drawbacks such as suboptimal performance, additional costs, inability to differentiate patients from carriers, and a significant time delay in obtaining results, requiring 24 to 48 hours for analysis. In practice, culture was infrequently conducted and was not recommended except for specific indications, such as investigating resistance to macrolides and ketolides based on susceptibility test data.[18,9]

Our study revealed that only 8% of doctors utilized RDTs in their practice. It is advisable to promote the widespread adoption of these tests and ensure that interested doctors have free access to them in their offices. This strategy could be integrated into national policies to enhance antibiotic prescription control in healthcare centers. However, certain limitations to the generalization of this test should be acknowledged: its sensitivity is less than 100%, implying that GAS pharyngitis could be overlooked; the test takes longer than prescribing an antibiotic, and the cost (5.64 euros in France, or approximately 60 dirhams) might pose a barrier in our context. Nevertheless, a French study demonstrated a substantial economic impact of the angina therapeutic strategy based on the use of GAS RDTs, resulting in a 48% reduction in antibiotic usage and an average cost decrease of €17 per patient (potentially saving over €27 million annually with nationwide extrapolation).[18]

Only 3% of doctors in our study advocated for systematic antibiotic therapy (Figure 2). The primary antibiotics prescribed in the initial treatment line were frequently amoxicillin alone, followed by protected amoxicillin, and macrolides were rarely used. A substantial 90.83% of doctors in our study believed that the purpose of antibiotic therapy was to prevent post-streptococcal complications. Pharyngitis management encompasses two approaches: the first involves the routine administration of antibiotics for all pharyngitis cases[19,20], while the second entails

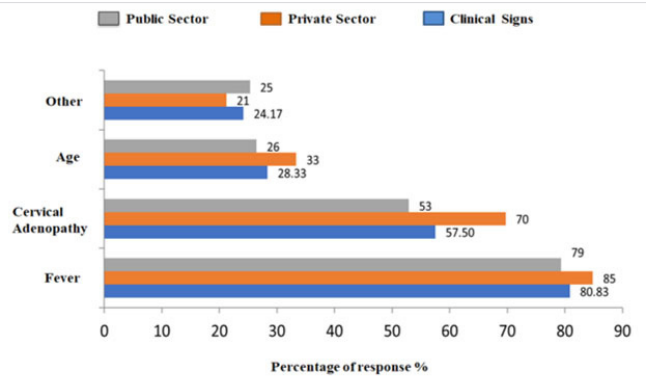

Figure 1: Clinical signs of bacterial pharyngitis

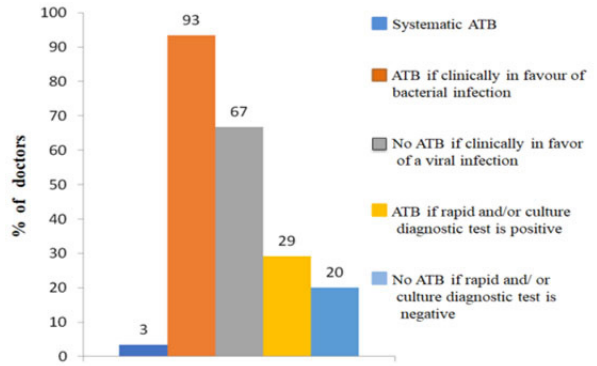

Figure2: Percentage of general practitioners using or not using systemic antibiotic therapy

treating only confirmed GAS pharyngitis with antibiotics, determined either by culture or rapid diagnostic tests.[2,21] The national infectious disease control program followed the first approach of systematically treating all pharyngitis with antibiotics.[19,20] However, during our study, most doctors expressed confidence in their ability to differentiate viral

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from bacterial pharyngitis, leading to routine antibiotic therapy being utilized in only 3% of cases.

Antibiotic therapy is warranted exclusively in cases of GAS pharyngitis (except in rare instances of diphtheria, gonococcal, or anaerobic angina) to reduce the index case's contagiousness, symptom duration, and the incidence of suppurative and non-suppurative complications. The recommended first-line treatment involves a 6-day course of amoxicillin, demonstrating efficacy comparable to penicillin V for 10 days, considering bacterial eradication rates and improved adherence in both children and adults. This trend was also observed in our study, where amoxicillin was the most frequently used antibiotic at a rate of 68%.[22,23]

In cases of true penicillin allergy without cephalosporin allergy, the recommended treatment is oral 2nd and 3rd generation cephalosporins. Macrolides are only indicated if there is a contraindication to all beta-lactams.[23]

Despite well-conducted and appropriately prescribed treatment, clinical failures may occur, necessitating clinical reassessment with the exclusion of alternative diagnoses. This may lead to a biological assessment, particularly for infectious mononucleosis or other bacterial etiologies. Symptomatic treatments to enhance comfort, including analgesics and antipyretic agents, are recommended. However, nonsteroidal anti-inflammatory drugs at anti-inflammatory doses and corticosteroids, in general, are not recommended, as there is insufficient data to establish their effectiveness in angina treatment, coupled with significant associated risks.

Conclusion

While the majority of pharyngitis cases are viral in origin, as many as 50% of individuals seeking medical attention for a sore throat receive antibiotic treatment. This prevalence of antibiotic use is attributed to the inadequacies of clinical evaluations in effectively distinguishing Group A Streptococcus (GAS) pharyngitis from other causes. The diagnosis can be confirmed through a throat smear culture or a rapid test detecting streptococcal antigen.

In a developing country like Morocco, where resources and equipment are limited, the current emphasis is primarily on raising awareness about the concept of viral pharyngitis. There is a hope that this awareness will lead to the recommendation and adoption of Rapid Diagnostic Tests (RDTs). It would be advantageous for the Ministry of Health to consider the utilization of RDTs to mitigate the inappropriate use of antibiotics, a practice contributing to bacterial resistance. Simultaneously, this approach ensures the prevention of potential complications associated with pharyngitis.

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24. ESSENTIAL POINTS:
25. 90% of pharyngitis is of viral origin. Abusive prescription of antibiotic therapy for all pharyngitis in children.

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