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Original Research Paper

Description of Antibiotic Use in Pediatric Pharyngitis Patients at Ibnu Sina YW-UMI Hospital, Makassar, 2022–2023

Andi Sitti Fahirah Arsal[1]*, Rika Dwi Jaya[2], Andi Alamanda Irwan[1], Sidrah Darma[3], Andi Husni Esa Darussalam[3]

[1]Department of Pharmacology, Faculty of Medicine, Universitas Muslim Indonesia
[2]Faculty of Medicine, Universitas Muslim Indonesia
[3]Department of Pediatrics, Faculty of Medicine, Universitas Muslim Indonesia

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Email Corresponding:
andisittifahirah.arsal@umi.ac.id

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Abstract

Background: Pharyngitis is inflammation of the pharynx, often caused by viral or bacterial infections, especially Group A beta-hemolytic Streptococcus in children. The Centor score helps identify bacterial cases. In Indonesia, respiratory tract infections account for 25% of illnesses, with Group A Streptococcus causing 5–36% of pharyngitis cases. **Objective:** To describe antibiotic use in pediatric pharyngitis patients at Ibnu Sina YW-UMI Hospital, Makassar, in 2022–2023. **Methods:** A retrospective study included patients aged 5–18 years diagnosed with pharyngitis. Data on age, sex, antibiotic type, and treatment duration were collected. **Results:** Seventy-one patients were analyzed; most were aged 5–9 years (50.7%) and male (66.2%). The most common treatment duration was 4 days (25.4%). Cephalosporins were the most used antibiotics, particularly 3rd generation (76.1%). Ceftriaxone was most prescribed (39.4%), followed by combination antibiotics (32.4%) and other cephalosporins like cefadroxyl and cefixime (8.5% each). **Conclusion:** Pediatric pharyngitis predominantly affects males aged 5–9 years. The average treatment duration is 4 days, with 3rd-generation cephalosporins, especially ceftriaxone, being the most commonly used antibiotics.

Keywords: *Pharyngitis, patient characteristics, antibiotic management.*

Introduction

Pharyngitis is an infection or inflammation of the pharyngeal mucosa. In most cases, it is caused by viral or bacterial infections. Less common causes include allergies, trauma, cancer, reflux, and certain toxins. Viral causes often resolve spontaneously, while bacterial and fungal infections typically require antimicrobial therapy [1].

Pediatric pharyngitis is frequently caused by bacterial infections, with approximately 30-40% of cases identified as bacterial. The most common bacterium causing pharyngitis is Group A beta-hemolytic Streptococcus. Therefore, determining the exact cause of pharyngitis is crucial. In Indonesia, the incidence of infectious diseases, particularly respiratory tract infections, is high, reaching about 25%. Group A beta-hemolytic Streptococcus is a major bacterial contributor, causing 5% to 36% of pharyngitis cases. This infection can be identified using the Centor score, which includes symptoms such as tonsillar exudate, tender anterior cervical lymph node swelling, fever history, and absence of cough. These symptoms are typically found in children aged 5 to 15 years and do not apply to children under 3 years [2].

Research by Oksana (2021) found that amoxicillin was chosen as the first-line antibiotic for streptococcal pharyngitis by 66.1% of respondents and pediatricians in primary care. Another study by Brittany J. Lehrer et al. (2024) showed that antibiotics

prescribed for acute pharyngitis patients were predominantly for males (50.7%), with a mean age of 8.36 years. Cefadroxil was the optimal antibiotic choice (38.5%), with appropriate duration in 51.3% of cases, and optimal for both choice and duration in 31.4% of cases [3,4].

White blood cell count has limited value in distinguishing viral from bacterial causes of pharyngitis. Rapid Antigen Detection Tests (RADT) are highly specific for detecting Group A beta-hemolytic Streptococcus, although sensitivity varies between 70% and 90%. If positive, antibiotic therapy should be initiated immediately. However, if negative, especially in children, throat culture should be performed to confirm diagnosis and guide appropriate treatment. Although throat culture is the standard diagnostic method, its sensitivity can vary depending on factors like bacterial load, sampling site, culture medium, and culture conditions [5,6].

If infection is confirmed and treated with appropriate antibiotics, the prognosis is good. Some patients may experience recurrent infections within one month after antibiotic treatment. This is often due to non-adherence to antibiotic therapy, though repeated exposure may also be a cause. Patients can be treated with alternative antibiotics, often with broader coverage, and the importance of treatment adherence and risk avoidance should be emphasized [5,7].

Several studies evaluate optimal antibiotic choices, but few consider both optimal antibiotic choice and duration. Evaluation of optimal antibiotic prescribing at clinical encounters across states remains limited. The primary objective of this study is to identify the overall percentage of optimal antibiotic prescriptions for inpatients with acute pediatric pharyngitis according to guideline recommendations for first-line antibiotic choice and duration. Additionally, this study aims to help clinicians better understand the characteristics of pediatric pharyngitis patients.

Based on the background above, the research problem is formulated as: "What is the description of antibiotic use in pediatric pharyngitis patients at Ibnu Sina YW-UMI Hospital, Makassar?".

Materials and Methods

Study Design

This study used a descriptive design with a cross-sectional approach. Descriptive research is a method conducted primarily to create an objective description of a situation. Additionally, a cross-sectional design involves collecting data using existing secondary data. Data used were obtained from medical records of pediatric patients diagnosed with pharyngitis and prescribed antibiotics at Ibnu Sina YW-UMI Hospital, Makassar, in 2022-2023.

Sample

Data collection commenced after obtaining permission from Ibnu Sina YW-UMI Hospital, Makassar.

Data Collection Technique

Data used were medical records of pediatric patients with pharyngitis at the hospital during 2022-2023 who met inclusion and exclusion criteria. Inclusion criteria included pediatric pharyngitis patients aged 5-18 years recorded in medical records, patients with gender information, those prescribed antibiotic therapy, and those with medical records documenting treatment duration.

Data Analysis Technique

Data obtained from patients were observed and presented as percentages and tables manually using Microsoft Excel to describe antibiotic use in pediatric pharyngitis patients at Ibnu Sina YW-UMI Hospital, Makassar, during 2022-2023.

Ethical Consideration

This study was approved by the Research Ethics Committee (REC) of Universitas

Muslim Indonesia with ethical recommendations valid until July 12, 2025. The ethical approval letter has reference number 285/A.1/KEP-UMI/VII/2024. The research was conducted adhering to research ethics principles, including maintaining patient data confidentiality and ensuring data use solely for research purposes as per the granted approval.

Result

The population recorded in medical records was 194 patients, but only 36.59% received antibiotic treatment for pharyngitis. After processing medical records, 71 pediatric pharyngitis patients with complete information meeting inclusion criteria were obtained. Results are presented in tables with explanations:

Table 1. Characteristics of Pediatric Pharyngitis Patients

Variable	Frequency (n)	Percentage (%)
Age		
5-9 years	36	50.70
10-18 years	35	49.30
Gender		
Male	47	66.20
Female	24	33.80
Treatment Duration		
1 day	2	2.82
2 days	3	4.23
3 days	10	14.08
4 days	18	25.35
5 days	15	21.13
6 days	8	11.27
7 days	11	15.49
8 days	3	4.23
10 days	1	1.41
Antibiotic Class		
Penicillin	5	7.04
Sulfonamide	2	2.82
1st Gen Cephalosporin	6	8.45
3rd Gen Cephalosporin	54	76.06
Combination	4	5.63
Total	**71**	**100**

Source: *Secondary Data, 2024*

Table 1 shows characteristics of pediatric pharyngitis patients. Most patients were aged 5-9 years (50.70%), while the rest were aged 10-18 years (49.30%). Males predominated (66.20%) over females (33.80%). Treatment duration varied, with the most common being 4 days (25.35%), followed by 5 days (21.13%) and 7 days (15.49%). A small proportion were treated for 1-2 days (2.82% and 4.23%), while only 1 patient (1.41%) was treated for 10 days. Antibiotic use was dominated by 3rd generation cephalosporins (76.06%), followed by 1st generation cephalosporins (8.45%), penicillin (7.04%), combinations (5.63%), and sulfonamides (2.82%). This data reflects demographic distribution, treatment duration, and antibiotic use patterns.

Table 2. Prevalence of Pharyngitis Patients by Antibiotic Type

Antibiotic Type	Dosage Form	Frequency (n)	Percentage (%)
Injectable			
Ampicillin	Vial	1	1.41
Ceftriaxone	Vial	28	39.44
Oral			
Ampicillin	Tablet	2	2.82
Amoxicillin	Tablet	1	1.41
Cefadroxyl	Tablet	6	8.45
Cefixime	Tablet	6	8.45
Cefixime	Syrup	2	2.82
Cotrimoxazole	Tablet	2	2.82
Injectable/Oral			
Combination	Vial/Tablet/Syrup	23	32.39
Total		**71**	**100**

Source: *Secondary Data, 2024*

Table 2 shows the prevalence of pharyngitis patients by antibiotic type and dosage form. Most patients received injectable antibiotics, with ceftriaxone (39.44%) being the most common, followed by ampicillin vial (1.41%). For oral antibiotics, the most used were cefadroxyl and cefixime tablets (each 8.45%), followed by cotrimoxazole (2.82%), cefixime syrup (2.82%), ampicillin (2.82%), and amoxicillin (1.41%). Combination antibiotics (injectable/oral) were used in 32.39% of patients. This data shows a preference for ceftriaxone as the primary injectable antibiotic and combinations as a significant therapeutic approach. These findings suggest that physicians tend to prioritize broad-spectrum antibiotics and combined regimens to ensure effective coverage against potential bacterial resistance in pharyngitis management.

Discussion

Age of Pharyngitis Patients

Based on data from Ibnu Sina Hospital Makassar (2022-2023), 71 pediatric patients aged 5-18 years with pharyngitis received antibiotic treatment. Results showed that the 5-9 year age group had the highest number of patients (50.7%), while the 10-18 year group comprised 49.3%.

The 5-9 year age group reflects that children remain vulnerable to respiratory tract infections, including pharyngitis, possibly due to their still-developing immune systems and high social interaction in school environments[8].

This aligns with research by Sutema et al. (2022), which evaluated antibiotic therapy rationality in acute pharyngitis. Their study found that 39.36% of pediatric pharyngitis patients were aged 6-8 years among 94 respondents. This may occur because pharyngitis involves inflammation of the pharyngeal mucosa and can spread to surrounding tissues, commonly affecting children aged 6-10 years in hot climates. Incomplete immunity makes children susceptible to respiratory pathogens. Children have high naive T-cell counts but cannot respond effectively to antigens during infection[8,9].

However, this contrasts with Rahmah et al. (2016), who studied antibiotic use rationality in pediatric pharyngitis. Their study found that 34.37% of pediatric pharyngitis cases occurred in ages 15-17 years among 59 respondents. This may be because pharyngitis-causing bacteria spread easily through air (e.g., saliva droplets from coughing). Adolescents are vulnerable due to more frequent outdoor activities and environmental exposures, facilitating bacterial entry [10,11].

Gender of Pharyngitis Patients

Based on data from Ibnu Sina Hospital Makassar (2022-2023), more males suffered from pharyngitis than females. Males comprised 66.2% of patients, while females were 33.8%, indicating male predominance.

This aligns with Milladi et al. (2014), who evaluated antibiotic use in pediatric pharyngitis. Their study found that 56.8% of patients were males among 95 respondents. This may occur because boys are more frequently exposed to respiratory pathogens due to higher activity levels than girls. Immunological response differences also contribute to higher respiratory disorder rates in males [8,12].

Gender is unrelated to pharyngitis incidence. Pharyngitis can affect anyone regardless of ethnicity, religion, race, or gender[12].

Treatment Duration

Based on data from Ibnu Sina Hospital Makassar (2022-2023), the most common treatment duration for pediatric pharyngitis was 4 days (18 patients, 25.35%).

This aligns with Tandi et al. (2018), who studied antibiotic prescribing for respiratory infections (including pharyngitis). Their study found that 32% of patients had treatment durations of 4-6 days among 38 respondents. This may occur because hospitalization for pharyngitis ranges from 4-7 days, depending on infection type (viral/bacterial) and response to antibiotic therapy. Patients with mild symptoms may be discharged earlier, while those with complications require longer care[13,14].

However, this contrasts with Robert et al. (2023), who studied pharyngitis. Their study found that most pharyngitis cases resolve spontaneously within 7-10 days. Treatment failure may occur if the cause is bacterial and antibiotics are not prescribed, or due to antibiotic resistance or non-adherence. Most streptococcal pharyngitis cases improve within 24-48 hours of treatment, though flu-like symptoms may persist for 5-10 days [15].

Antibiotic Class Use

Based on data from Ibnu Sina Hospital Makassar (2022-2023), the most commonly used antibiotic class was cephalosporins (60 prescriptions), comprising 3rd generation (54 prescriptions, 76.06%) and 1st generation (6 prescriptions, 8.45%).

This aligns with Milladi et al. (2014), who evaluated antibiotic use in pediatric pharyngitis. Their study found that 37.9% of patients received 3rd generation cephalosporins among 95 respondents. This may occur because 3rd generation cephalosporins are the most prescribed class. Cephalosporins are broad-spectrum antimicrobials active against gram-negative and gram-positive organisms. Some 3rd generation agents can cross the blood-brain barrier [12,16].

However, this contrasts with Sutema et al. (2022), who evaluated antibiotic therapy rationality in acute pharyngitis. Their study found that 46.96% of patients received penicillin-class antibiotics among 66 respondents [9].

Penicillin and cephalosporin classes are widely used because they serve as empirical therapy for infections of unknown etiology, utilizing broad-spectrum antibiotics like penicillin and cephalosporins [17].

Antibiotic Type Use

Based on data from Ibnu Sina Hospital Makassar (2022-2023), the most commonly prescribed antibiotic was ceftriaxone (28 prescriptions, 39.44%).

The high percentage of ceftriaxone use may reflect hospital policies for managing more serious or complex infections and considerations of antimicrobial resistance. Antibiotic choice must consider effectiveness against potential pathogens and local resistance patterns. Inappropriate antibiotic use can increase bacterial resistance. Thus, clinicians must make accurate diagnoses and consider antibiotic indications based on examination findings and clinical history. At YW-UMI Ibnu Sina Hospital, ceftriaxone (a broad-spectrum antibiotic) is frequently prescribed for bacterial infections like pharyngitis. Ceftriaxone use is also tailored to the hospital's bacterial patterns, as it is more commonly given for bacterial infections, including pharyngitis [18,19].

These findings confirm ceftriaxone as a common and effective choice for managing bacterial pharyngitis at this hospital. They also highlight the need for prudent antibiotic use to prevent future resistance and the importance of ongoing monitoring and evaluation of community resistance patterns [20].

This aligns with Gina (2021), who evaluated antibiotics in pediatric pharyngitis. Their study found that 56% of patients received ceftriaxone among 174 respondents. This may occur because ceftriaxone is a 3rd generation cephalosporin with broad-spectrum activity. It is often used as empirical therapy when hospitalized patients are suspected of having infections. Parenteral administration also offers advantages like faster onset and usability in unconscious or specific-condition patients [21].

However, this contrasts with Anisa et al. (2022), who evaluated antibiotic use in outpatient pharyngitis. Their study found amoxicillin as the most commonly used antibiotic. Amoxicillin is a broad-spectrum antibiotic, making it a relatively safe and appropriate choice for respiratory infections, serving as empirical therapy for infections of unknown etiology [22].

Conclusion

Based on results describing antibiotic use in pediatric pharyngitis patients at Ibnu Sina YW-UMI Hospital, Makassar (2022-2023), it can be concluded that pharyngitis in children aged 5-18 years is more common at ages 5-9 years. Additionally, pharyngitis occurs more frequently in males. The average treatment duration is 4 days. The most commonly used antibiotic class is cephalosporins, particularly

3rd generation. The most frequently prescribed antibiotic is ceftriaxone.

Prospective studies are needed for future periods to monitor antibiotic use trends in pharyngitis patients, especially children. Additionally, monitoring via questionnaires should assess parental knowledge and adherence regarding antibiotic administration in pediatric pharyngitis. Ibnu Sina YW-UMI Hospital, Makassar, is also encouraged to complete patient medical records more detailedly to facilitate data analysis for researchers.

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