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Microbiological Profile of Pharyngotonsilitis in National Hospital, Abuja, Nigeria

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AN designed the study, extracted the data, analyzed the data and wrote the manuscript. IKC participated in the design and acquisition of data, and critically revised and edited the manuscript.

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Background: Pharyngotonsillitis is a common reason for consultations with the paediatrician and family physician. Although, a predominant problem of children, people of all age groups can be affected. Appropriate treatment depends on the knowledge of the bacterial aetiologies, and the susceptibility pattern in a locality to the commonly prescribed antimicrobials.

Aim: To determine the bacteriologic profile and antimicrobial susceptibility pattern of pharyngotonsillitis in patients seen at the National Hospital Abuja (NHA).

Methods: This was a retrospective review and analysis of the laboratory data of processed throat swab samples of patients with a suspected throat infection at NHA Abuja from February 2015 to December 2016.

Result: Out of a total of 297 throat swab samples of patients analysed within the period studied, 45 grew bacterial pathogens giving an infection prevalence of 15.2%. The prevalence of pharyngotonsillitis was not essentially different in males (51.1%) and females (48.9%). Age group 0-6 years had the highest number of cases of pharyngotonsillitis 28 (62.2%). Staphylococcus aureus (S. aureus) was the most predominant isolates (44.4%), followed by Klebsiella pneumoniae (15.5%), streptococci species other than Streptococcus pyogenes (9.0%) and Streptococcus pyogenes (4.4%). These predominant bacterial pathogens were generally highly susceptible to amikacin, imipenem and ciprofloxacin, while S. aureus, in addition, was highly susceptible to azithromycin, gentamycin augmentin and erythromycin.

Conclusion: There was low prevalence of pharyngotonsillitis. S. aureus was the most common cause of this condition. Imipenem, amikacin, azithromycin, ciprofloxacin and gentamycin represent an excellent choice for the treatment of pharyngotonsillitis in this environment. Regular surveillance for the aetiologic agents of this infection, as well as their susceptibility profile to antimicrobials, are recommended for appropriate management of this condition.

Key Words: Microbiological, Profile, Pharyngotonsillitis, Abuja, Nigeria

INTRODUCTION

Pharyngotonsillitis is one of the most common infections encountered by paediatricians and family physician [1-4]. This infection occurs predominantly in school-aged children, but patients of any age may be affected [5]. Although most cases of pharyngotonsillitis are viral in origin, bacterial pathogens, however, are implicated in the aetiology of approximately 30% to 40% of this infection [6]. Although most literature has documented Streptococcus pyogenes (S. pyogenes) as the most common bacterial cause of pharyngotonsillitis with its important attendant sequelae of rheumatic fever and rheumatic heart disease [7-10]; studies revealing Staphylococcus aureus (S. aureus) as the leading bacterial etiologic agent of this infection is also on the increase [11-13]. Therefore, knowledge of the bacterial profile of this infection and their antibiotic susceptibility pattern in any environment is essential in the choice of appropriate antimicrobial therapy for this condition. The primary objective of this study was to determine the bacteriological profile and antibiotic sensitivity pattern of patients with acute pharyngotonsillitis in National Hospital, Abuja (NHA).

MATERIALS AND METHOD

This was a retrospective study conducted at the NHA, a 200-bed tertiary health facility located in Federal Capital Territory (FCT) of Nigeria. It serves the FCT residents and patients referred from other parts of the country. It has well-equipped wards and outpatient departments for various clinical specialties. Data of processed throat swab samples of patients with clinical diagnosis of pharyngotonsillitis from February 2015 to December 2016 were extracted from medical microbiology laboratory record book and evaluated. In our facility, throat swab samples received at the medical microbiology laboratory of NHA are usually inoculated directly onto blood agar, chocolate agar, and MacConkey agar plates respectively without delay. Chocolate agar plates are incubated at 37°C for 24 hours under 5-10% CO2 in a candle jar, while blood agar and MacConkey agar plates are incubated at 37°C for 24 hours under aerobic condition. Isolates recovered are identified using standard bacteriological methods [14, 15]. The isolates are subsequently subjected to antimicrobial susceptibility testing using the modified Kirby-Bauer technique and results interpreted according to the Clinical Laboratory Standard Institute guideline [16].

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RESULTS

A total of 297 throat swab samples were received and processed within the period under review out of which 45 (15.2%) were culture positive. Twenty-three (51.1%) of these patients were males, while 48.9% were females (Table 1). Twenty-eight (62.2%) of these patients were aged 0-6 years, 3 (6.7%) 7-13 years, 1(2.2%) 14-20 years, and 13 (28.9%) ≥ 21 years (Table 1). Twenty (44.4%) of the isolated bacteria were S. aureus, 7 (15.5%) Klebsiella pneumonia (K. pneumoniae), 6 (13.3%) streptococci species other than S. pyogenes, 4 (9.0%) S. pyogenes, 2 (4.4%) Escherichia coli (E. coli), and 2 (4.4%) others (Table 2).

S. aureus was 100% sensitive to imipenem, 90% to amikacin, 87.5% to azithromycin, 71.4% to ciprofloxacin, 70.0% to gentamycin, 66.7% to erythromycin, and 60.0% to augmentin (Table 3). K. pneumonia was 100% sensitive to imipenem, meropenem, amikacin, ceftriaxone and ceftazidime respectively, but 71.4% sensitive to ciprofloxacin (Table 3).

Streptococci species other than S. pyogenes were 100% susceptible to ciprofloxacin and levofloxacin respectively, but 60.0% to cefuroxime and augmentin respectively (Table 3).

S. pyogenes was 100% sensitive to imipenem, augmentin, cefuroxime and clindamycin, but was 66.7% sensitive to either ciprofloxacin or erythromycin (Table 3).

The sensitivity results of the other bacterial isolates are as shown in Table 3.

Table 1. Gender and Age distribution of Pharyngotonsillitis.

Gender	**No (%)**
Male	23 (51.1)
Female	22 (48.9)
Total 45 (100)	
Age (years)	**No (%)**
0-6	28 (66.2)
7-13	3 (6.7)
14-20	1 (2.2)
≥21	13 (28.9)
Total 45 (100)	

No.= Number of cases of pharyngotosillitis, %=percentage of cases of pharyngotonsillitis

Table 2. Frequency of Isolates from Pharyngotonsillitis

Isolates	**No (%)**
S. aureus	20 (44.4)
K. pneumoniae	7 (15.5)
Streptococci spp	6 (13.3)
S. pyogenes	4 (9.0)
Enterococcus spp	4 (9.0)
E. coli	2 (4.4)
P. aeruginosa	1 (2.2)
Providentia	1 (2.2)
Total 45 (100)	

No.= Number of isolates, %=percentage of isolates

Antibiotics	**S.a**	**K.p**	**Strep spp**	**S. p**	**Enter Spp**	**E.c**	**P.a**	**Provid Spp**
	N(%S)	**N(%S)**	**N(%S)**	**N(%S)**	**N%S)**	**N(%S)**	**N(%S)**	**N%S)**
Ciprofloxacin	7(71.4)	7(71.4)	2(100)	3(66.7)	2(100)	2(50.0)	1(100)	1(0)
Augmentin	15(60.0)	3(0)	5(60.0)	3(100)	3(100)	2(100)	–	1(0)
Gentamyin	14(70.0)	3(33.3)	–	2(50.0)	–	1(0)	1(0)	1(0)
Cefuroxime	11(36.4)	6(33.3)	5(60.0)	3(100)	2(50.0)	2(50.0)	–	–
Amikacin	10(90.0)	6(100)	–	–	2(0)	2(50.0)	1(100)	1(100)
Azithromycin	8(87.5)	1(0)	4(25.0)	–	–	–	–	–
Erythromycin	9(66.7)	–	2(0)	3(66.7)	3(66.7)	–	–	–
Imipenem	4(100)	2(100)	–	1(100)	–	1(100)	1(100)	1(100)
Meropenem	–	5(100)	–	–	–	–	–	–
Clindamycin	15(40.0)	–	4(25.0)	2(100)	3(0)	–	–	–
Ceftriazone	6(50.0)	2(100)	–	–	2(100)	–	1(100)	–
Ceftazidime	–	2(100)	–	–	–	–	–	–
Levofloxacin	2(50.0)	–	3(100)	–	–	–	–	–
Amp-Sulb	1(100)	1(0)	–	–	1(0)	–	–	–

S.a= S. aureus, K.p= K. pneumonia, Strep spp= Streptococci species, S.p=S. pyogenes, Enter spp= Enterococcus spp, E.c=E. coli, P.a= P. aeruginosa, Provid spp: Providentia spp

DISCUSSION

The prevalence of bacterial pharyngotonsillitis in this study was 15.2%. This prevalence is low when compared with earlier studies that recorded the prevalence rates of 53.42% – 72.0% [8,12,17,18]. We suspect that prior use of antibiotics and possible viral etiologic agents might be responsible for the low yield of throat culture in this study.

There was essentially no difference between the prevalence of pharyngotonsillitis in males (51.1%) and females (48.9%). The reason for this is unclear.

The highest percentage of pharyngotonsillitis was caused by S. aureus (44.4%). This finding is in agreement with those of previous studies [11-13, 19]. That K. pneumonia was the next most common aetiologic agent of pharyngotonsillitis in this study was also reported in a previous study [18]. However, S. pyogenes, the fourth commonest cause of pharyngotonsillitis in this study, has been reported as the commonest cause of this infection in several previous studies [7-10]. The highest number of cases of pharyngotonsillitis was found in children aged 0-6 years which also agrees with the findings of other researchers [18, 20], possibly because of immatured immune system in this age group.

S. aureus was highly sensitive to imipenem (100%), amikacin (90%),

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azithromycin (87.5%), ciprofloxacin (71.4%) and gentamycin (70.0%), but was of moderately sensitivity to erythromycin (66.7%) and augmentin (60.0%).
S. pneumoniae was found to be highly susceptibility to imipenem (100%), meropenem (100%), amikacin (100%), ceftriaxone (100%), ceftazidime (100%) and ciprofloxacin (71.4%).

Streptococci species other than S. pyogenes were highly sensitive to ciprofloxacin (100%), levofloxacin (100%), but of moderate sensitivity to cefuroxime (60.0%) and augmentin (60.0%).

Excellently high susceptibility was displayed by S. pyogenes against imipenem, augmentin, cefuroxime and clindamycin, while its susceptibility to erythromycin and ciprofloxacin was moderately high. Other researchers have also documented similar high sensitivity to these common antimicrobials [8, 12].

CONCLUSION:

S. aureus was the most common aetiologic agent of pharyngotonsillitis in our setting. Furthermore, aminoglycosides, imipenem, azithromycin, ciprofloxacin, erythromycin and augmentin represent a good choice for empirical treatment of pharyngotonsillitis.

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