

# Prescription patterns of Antibiotics in Acute tonsillitis: Hospital-based study

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## ABSTRACT

**Introduction:** Acute tonsillitis is caused by either viruses or bacteria and is characterized by a sore throat and painful swallowing. About 49% of cases are thought to be caused by Group A beta-hemolytic streptococci. Penicillin should be given empirically after the diagnosis of acute tonsillitis. This study was carried out to find out the prescription pattern of antibiotics among the admitted cases of acute tonsillitis. **Materials and Methods:** This study was conducted in the Department of Otorhinolaryngology and Head and Neck Surgery, Gandaki Medical College Teaching Hospital and Research Centre (GMCTH), Pokhara. All the patients who were admitted for acute tonsillitis in the ENT ward were enrolled in this study. Age, gender, the average number of drugs per prescription, and the most commonly prescribed drug was recorded. **Results:** There were 320 patients with acute tonsillitis and the mean age was  $27.44 \pm 11.1$  years. Most of the cases were in their twenties. The average number of drugs per prescription was four while the total number of antibiotics used was 520. The single antibiotic was used in 170 (53%) cases and a two-drug combination was used in 91 (28.4%) cases. Ceftriaxone was the most commonly prescribed drug. There were 78 (24.3%) cases under monotherapy and 69 (21%) in multitherapy. **Conclusion:** Among the various effective antimicrobials, ceftriaxone was the most commonly prescribed antimicrobial. The injectable route of antibiotics administration was a widely used method in hospitalized patients in our setting.

**Keywords:** Acute tonsillitis, Antibiotics, Ceftriaxone.

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## INTRODUCTION

The antibiotic prescription pattern differs from one country to another which depends on common infecting organisms, antibiotic susceptibility, physician preference, and cost. It should be evaluated and monitored periodically to increase therapeutic benefit, decrease the adverse effect, and prevent drug resistance.<sup>1, 2</sup> Such practice will help the clinician to develop a protocol to treat the patients. The majority of serious cases of acute tonsillitis are found to be of bacterial origin. Group A beta-hemolytic streptococci are the most common causative agent that includes 5 to 80% of tonsillar infections.<sup>3</sup> Other bacterial agents are Hemophilus influenza, Mycoplasma pneumonia, Neisseria meningitis, etc., which are less common.<sup>4</sup>

In the Nepalese scenario, it is found that many patients either don't follow the prescribed drugs or they don't complete the course prescribed by a medical practitioner which finally leads to drug resistance. Penicillin is the drug of choice in bacterial acute tonsillitis. It may be ineffective or partially effective as most of the patients come to the hospital after taking multiple courses of antibiotics from the pharmacy

without prescriptions from medical practitioners which may lead to a serious problem.<sup>5</sup> Most of the patients would be under oral antibiotics when they visit the hospital. Therefore, it is difficult to treat them with oral medication. Such patients are admitted to the hospital for intravenous (IV) medications and fluid replacement after consultation with consultants.

The present study was aimed to determine the antimicrobial prescription pattern in a hospitalized patient with acute tonsillitis in GMCTH.

**MATERIALS AND METHODS**

This is a Prospective cross-sectional hospital-based study conducted in the Department of Otorhinolaryngology and Head & Neck Surgery, GMCTH, Pokhara from January 2016 to June 2018. Ethical clearance was obtained from the Institutional Ethical Review Committee. All the patients who were admitted for acute tonsillitis in the ENT ward were enrolled. The inclusion criteria for admission of such patients were fever more than 100.4 degrees Fahrenheit, severe odynophagia and pharyngotonsillar exudate, uvular edema, and painful axillary lymph node. Those patients who had a recurrent episode of acute tonsillitis, peritonsillar abscess, cough, rhinorrhea, and pyrexia of unknown origin were excluded from the study.

Information about age, gender, the average number of drugs per prescription, and the name of the drug was obtained. All the data were entered into a customized data collection sheet. Data were presented in appropriate tables and figures. Appropriate statistics were applied whenever applicable by using SPSS 23.0 software.

**RESULTS**

The total number of patients included in this study was 320 with the mean age of 27.44 ± 11.1 years and range from 5 to 73 years. Majority of the patients visiting the hospital with signs and symptoms of acute tonsillitis were found to be in the age group of 21 to 30 years with 138 (43.1%) patients followed by 11 to 20 years. (Table.1) The prevalence of drug use is shown in Table 2. Ceftriaxone was the most commonly prescribed drug. There were 78 (24.3%) cases under monotherapy among which 65 (20.3%) were given Amoxicillin-clavulanic acid. Similarly, 69 (21%) cases were given multitherapy. (Table 3)

Table 1. Distribution of patients receiving antibiotics in acute tonsillitis by age group

S.N.	Age group in years	No of patients (%)
1.	<10	9 (2.8%)
2.	11-20	77 (24.1%)

3	21-30	138 (43.1%)
4	31-40	60 (18.1 %)
5	41-50	20 (6.3%)
6	51-60	14 (4.4%)
7.	> 61	2 (0.6%)
	Total	320 (100%)

Table 2. Prevalence of antibiotics uses.

	No (%)
The average number of drugs per prescription	3.5
Percentage of prescriptions with injections	85.6 %
Total number of prescriptions with antimicrobials	320
Total number of antimicrobials prescribed	510
The number of prescriptions with:	320
Antibacterial drugs	
Single antibacterial agent	170
Two drug combination	91
Three drug combination	40

Table 3. Different antibiotics used in Mono and combination therapy.

Antibiotics used	Monotherapy	Combination therapy
Ampicillin-cloxacillin	22	17
flucloxacillin	28	9
Amoxicillin- clavulanic acid	65	18
Ceftriaxone	78	42
Ceftriaxone -tazobactam	24	3
Piperacillin- tazobactam	12	2
Ornidazole	-	60
Metronidazole	-	64
clindamycin	-	12

**DISCUSSION**

The present study shows the general trend of prescribing IV antibiotics among hospitalized patients with acute tonsillitis. The most common age group who needed IV antibiotics were within 21 to 30 years, 138 (43.1%); it also shows an acute episode of tonsillitis decrease with increasing age. It is better to make national guidelines to prescribe antibiotics. A study by Murphy et al shows 78.5% prescriptions were not according to national guidelines.<sup>6</sup> The number of drugs per prescription is 3.5 in our study, which is higher than the study by Rehan et al who found 3.2%. Polypharmacy needs to be controlled to reduce adverse drug reaction, drug interaction, and cost.

In our study, prescription of the drug was empirically

chosen on the day of admission, however, it is better to tailor antibiotics according to Gram stain, culture, and sensitivity report. Ceftriaxone was found to be the most prescribed antimicrobial which is a bit costly. Therefore, it was not advised to our patients to reduce total cost as most of the patients were of low socioeconomic status. Bird et al reported in their study that, patients presenting with an inability to swallow with systemic features, the use of an IV antibiotic initially, and then converting to oral therapy later is likely to be sound clinical practice.<sup>7</sup> Therefore, 85.6% of patients were given IV antibiotics as they were unable to take oral antibiotics or had worsening symptoms with oral medications.

Most commonly prescribed categories of antibacterial drugs were found to be from  $\beta$ -lactam antimicrobials (Penicillin and Cephalosporins).<sup>8,9</sup> However, Das et al. in his study mentioned that ciprofloxacin is most commonly prescribed drug followed by Amoxicillin.<sup>11</sup> In our study, the antibiotics prescribed in the majority of patients were ceftriaxone followed by Amoxicillin with Clavulanic acid as these drugs are standard regimes recommended by the World Health Organization (WHO 2013) in the management of upper respiratory tract infections.<sup>10</sup> Combination therapy is also used for the treatment of tonsillitis. In our study most commonly prescribed drug in combination therapy is either metronidazole or ornidazole with Amoxicillin/clavulanic acid or ceftriaxone. Metronidazole has an antibacterial activity for non-beta-hemolytic streptococcus tonsillitis.<sup>12</sup> In this study, antibiotics were prescribed empirically. It would be better if the culture and sensitivity tests were done to tailor the prescription of drugs.

## CONCLUSION

This study concludes that Beta-lactam antimicrobials were the most commonly prescribed antimicrobials. The injection was a widely used route of administration among hospitalized patients with acute tonsillitis.

**Conflict of Interest:** none

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