

## Patterns of Antimicrobial Therapy for Sore Throat in a Teaching Hospital of India

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Sore throat is a common presentation in outdoor patient setting, most cases of sore throat are viral in aetiology and do not require antibiotics, it is a common practice to prescribe antibiotics to all patients presenting with sore throat without identifying aetiology, purpose of this study was to determine antimicrobial prescription pattern in patients with acute sore throat. This is a descriptive and observational study, observed participants without providing any interventions, after fulfilling inclusion and exclusion criteria, patients were enrolled into study and informed written consent was obtained from all patients after a detailed explanation prior to enrolment, data was obtained from medical records, analysed descriptively and Modified Centor scoring system was used to determine appropriateness of antibiotics, results depicted in the form of tables and figures. A total of 90 patients, who presented with sore throat were enrolled for the study. Inflammation of posterior pharyngeal wall was observed in 77% patients, while exudate was seen in 50%, tonsils were enlarged in 11% cases and cervical lymphadenopathy was present in 1.1%. Analysis of prescriptions showed that beta lactams were widely prescribed antibiotics, followed by macrolides, followed by quinolones and aminoglycosides and 50% patients received antibacterial monotherapy, whereas 50% were on multiple antibacterial drug therapy, prescribing multiple antimicrobials without any culture sensitivity was encountered in this study and there were less generic drugs prescribed. There is a need of educational programmes in order to bring rational use of antibiotics and empirical prescription of antibiotics for sore throat in most cases is unjustified and the practice must be discouraged.

**Keywords:** Antibiotics, Centor score, Generic drugs, Beta lactams, Inappropriate prescribing.

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Acute sore throat is one of the commonest complaints in medical practice, most of these cases are viral in aetiology and do not require antibiotics.<sup>1,2,3</sup> Among healthy individuals with acute pharyngitis, the only bacterial pathogen of concern, which requires antibiotic treatment is Group A Streptococcus because of its potential

to cause rheumatic fever<sup>4</sup>. However, it is a common practice to prescribe antibiotics to all patients presenting with sore throat without identifying aetiology by either throat swab culture or streptococcal antigen detection, such practices lead to a waste of resources, expose patients to potentially harmful side effects of

drugs and promote development of resistance in the bacteria.<sup>2,3</sup>

Original Centor score uses four signs and symptoms to estimate probability of acute streptococcal pharyngitis in adults with a sore throat,<sup>5</sup> score was later modified by adding age and validated in adults and children,<sup>6,7</sup> cumulative score determines likelihood of streptococcal pharyngitis and need for antibiotics, arguments for antibiotic treatment include acute symptom relief, prevention of suppurative and nonsuppurative complications, and reduced communicability.<sup>8, 9, 10, 11</sup>

The purpose of this study was to determine antimicrobial prescription pattern in patients with acute sore throat.

## MATERIALS AND METHODS

Study was undertaken in collaboration with department of ENT at Government General Hospital, Kakinada, conducted for a period of 3 months. Institutional ethical committee clearance was taken. This is a descriptive and observational study where participants were observed without providing any interventions related to treatment prescribed and then results are presented descriptively.

After fulfilling the inclusion and exclusion criteria, patients were enrolled into the study and informed written consent was obtained from all patients after a detailed explanation prior to enrolment, patients presenting with sore throat, who were prescribed antibiotics were included in the study, patients who were taking or had taken antibiotics during the last 48 hours were excluded, results were depicted in the form of tables and Figures. Microsoft word and excel are used to generate figures and tables.

**Table 1.** Modified Centor scoring system points

Criteria	Points
Absence of cough	1
Swollen tender anterior cervical nodes	1
Temperature >100.4 F	1
Tonsillar exudates	1
Age <15	+1
Age >44	-1

## RESULTS

A total of 90 patients were enrolled into the study out of which 46 (51.11%) were male patients and 44 (48.89%) were female patients; patients ranging from 16 to 60 years are included in the study. A modified Centor score, which also considers patient's age, was calculated for all patients who met inclusion criteria

It was observed that most commonly prescribed antimicrobials were  $\beta$ -lactams followed by macrolides, quinolones and aminoglycosides.

Prescriptions showed that 50% patients received antibacterial monotherapy, whereas 50% were on multiple antibacterial drug therapy, among those who received multiple antibacterial therapies, 40% received two drug therapies and 10% received three drug therapies.

## DISCUSSION

Ideally, throat swab cultures should be performed, which not only confirm the presence of Group-A Streptococci but also provide antimicrobial susceptibility report,<sup>5,12</sup> however, culture results take 48-72 hours and require follow-up visits, while culture facilities are not widely available in under-developed countries. Rapid antigen detection tests (RADTs) for streptococcal antigens on throat swabs are bedside procedures, which provide immediate results but they may not be freely available,<sup>5,12</sup> in the absence of these facilities, clinical criteria such as Centor score or its modification can be used to rule out streptococcal throat infection with reasonable confidence.<sup>5</sup> McIsaac modification of Centor score assigns a low probability of

**Table 2.** Modified Centor scoring system and risk of streptococcus infection for acute pharyngitis patients

Centor	Risk of streptococcus infection
<0	1-2.5%
1	5-10%
2	11-17%
3	28-35%
>4	51-53%

streptococcal throat infection in the presence of cough and absence of cervical lymphadenopathy and tonsillar swelling/ exudates.<sup>13,14</sup>Majority of our patients (77%) complained of cough, while only a few had enlarged tonsils (11%) or cervical lymphadenopathy (2.2%),clinical findings alone should have precluded the use of antibiotics in most of these patients.

**Table 3.** Guidelines for management

-1,0 or 1 point	No antibiotic or throat culture necessary
2 or 3 points	Should receive throat culture and treat with an antibiotic if culture is positive
4 or 5 points	Consider rapid strep testing and or culture (risk of strep. Infection is >50%)

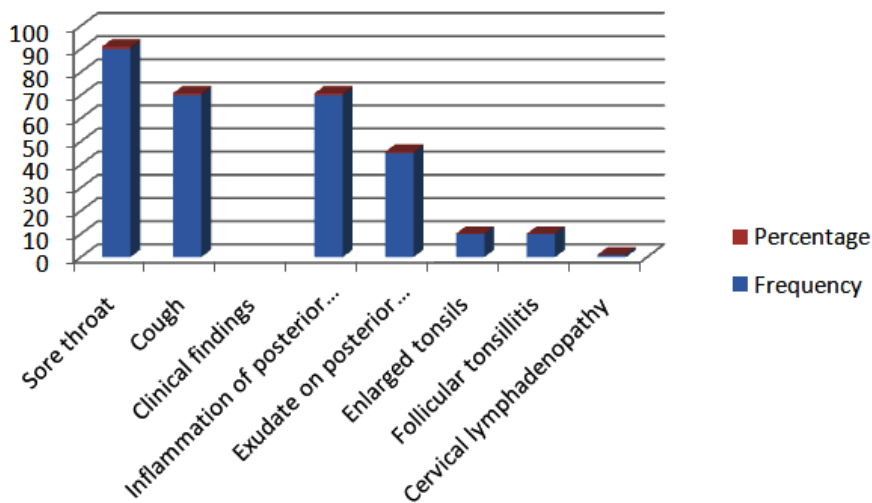
Injudicious use of antibiotics is a global problem, which is escalating healthcare costs, exposing patients to side effects of drugs and promoting antimicrobial drug resistance,<sup>2,3</sup> studies from around the world have highlighted this problem with prescription rates varying from 35% to 80%.<sup>2,15,16</sup>

In our study,demographic characteristics showed that males were found to be predominant sufferers from ENT infections than females which might be attributed to occupational reasons and poor hygiene, similar findings were also reported in studies conducted by Yadav *et al.*, Ain *et al.*, Shankar *et al.* and Pradhan *et al.*<sup>17, 18, 19, 20</sup>

In our study most commonly prescribed category of antimicrobials were  $\beta$ -lactams followed by macrolides and quinolones, these results are similar to study conducted by Khan *et al.*<sup>21</sup>

**Table 4.** Showing frequency of presenting complaints, clinical findings and percentage

Presenting complaint	Frequency	Percentage
Sore throat	90	100%
Cough	70	77%
Clinical findings		
Inflammation of posterior pharyngeal wall/tonsils	70	77%
Exudate on posterior pharyngeal wall/tonsils	45	50%
Enlarged tonsils	10	11%
Follicular tonsillitis	10	11%
Cervical lymphadenopathy	1	1.1%



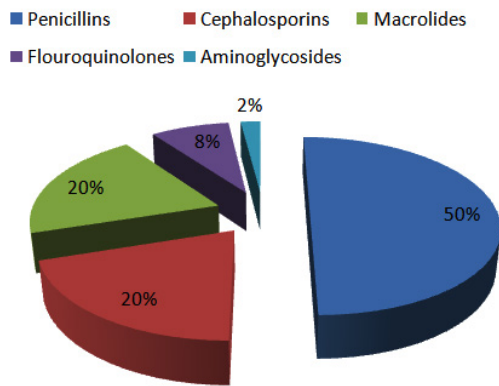
**Fig. 1.** Bar diagram showing frequency of presenting complaints,clinical findings and percentage

The average number of antimicrobial agents prescribed per patient per course was found to be slightly high, these results are similar to studies conducted by Ain *et al.* and Das *et al*<sup>18,23</sup> Since it is an important indicator for assessing rationality of prescription, physicians should try to keep the average number of drugs per prescription to a minimum as higher values results in increased risk of drug interactions, adverse drug effects,

development of bacterial resistance and increased cost of treatment.

Prescription by brand name is an issue that needs to be addressed; generic prescribing is more cost effective, associated with less potential for errors and is therefore encouraged by all prescribers.

Different strategies have been proposed to overcome the problem of irrational use of antibiotics, aggressive programmes to educate doctors, utilization of clinical decision rules like Centor score and wider availability of RADTs can help in reducing injudicious use of antibiotics for sore throat.



**Fig. 2.** Pie diagram showing percentage of various antibiotics prescribed in study population

**Table 5.** Showing Percentage of Various antibiotics prescribed in study population

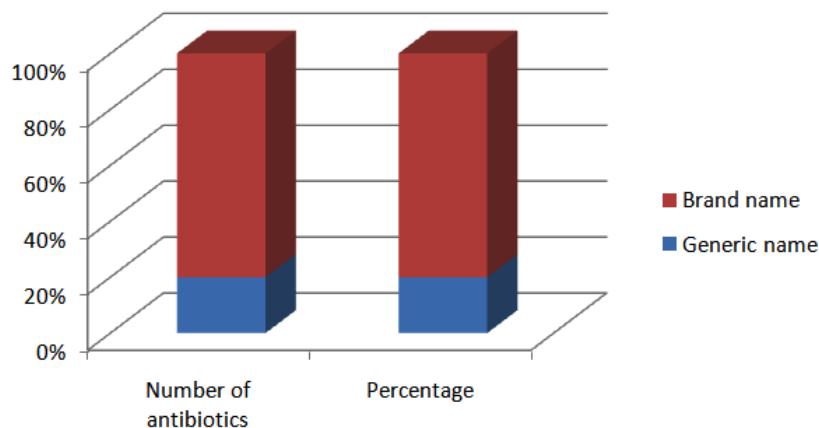
Antibiotics prescribed	Percentage
Penicillins	50%
Cephalosporins	20%
Macrolides	20%
Flouroquinolones	8%
Aminoglycosides	2%

**Table 6.** Showing details of prescriptions with brand name and generic name

Prescribing practice	Number of prescriptions	Percentage
Brand name	80	80%
Generic name	20	20%

**Table 7.** Showing Pattern of prescriptions

Prescription containing number of drugs	Number of prescriptions	Percentage
1	50	50%
2	40	40%
3	10	10%



**Fig. 3.** Bar diagram showing details of prescriptions with brand name and generic name

### Limitations

Duration of study was short; hence effect of seasonal variation could not be determined, on generalizability of study findings as the study was carried out at a single centre, further large scale research is required for detail evaluation.

### CONCLUSION

Prescribing multiple antimicrobials without any culture sensitivity was encountered in this study and there were less generic drugs prescribed, dedicated training hours on prescribing of antimicrobials in ENT diseases for doctors along with regular prescription audit will help promote rationale use of antimicrobials in the long run.

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