

Research Article

Drug Utilization Study in Patients of Chronic Suppurative Otitis Media Patients Attending a Government Tertiary Care Hospital in Jaipur City

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ABSTRACT

Background: Chronic Suppurative Otitis Media (CSOM) remains a significant public health problem in developing countries, including India, contributing to morbidity, hearing impairment, and decreased quality of life. The rational use of antimicrobials and adjunctive medications plays a crucial role in the effective management of CSOM and in preventing antimicrobial resistance.

Objectives: To analyze the prescribing patterns of antimicrobials and other drugs in patients diagnosed with CSOM attending the outpatient department of a government tertiary care hospital in Jaipur City.

Methods: A prospective, cross-sectional observational study was conducted over a period of six months among patients clinically diagnosed with CSOM. Drug utilization pattern was analyzed to identify the frequently prescribed antimicrobials and other therapeutic drug classes.

Results: The majority of patients were in the [31-45 years], with a slight predominance of females. Oral antimicrobials were the most frequently prescribed drugs, followed by systemic antibiotics such as ciprofloxacin. Adjunctive drugs included antihistamines, nasal decongestants, and analgesics. Polypharmacy was minimal, and adherence to the essential drug list prescribing was noted in all the cases.

Conclusion: The prescribing pattern in CSOM patients at this tertiary care hospital showed a preference for antimicrobials like fluoroquinolones and beta lactams. The predominance of oral drug use supports patient compliance and ease of use. However, continuous monitoring, adherence to treatment guidelines, and judicious antimicrobial use are essential to curb resistance and ensure optimal patient outcomes.

Keywords: Chronic Suppurative Otitis Media, Prescribing Trends, Antimicrobials, Drug Utilization Pattern.

INTRODUCTION

Chronic suppurative otitis media (CSOM) is a persistent infectious and inflammatory condition of the middle ear, characterized by recurrent otitis media lasting at least 2–6 weeks through a perforated tympanic membrane.¹ The pathophysiology begins with mucosal irritation and inflammation, leading to edema, ulceration, epithelial breakdown, and ultimately the formation of granulation tissue and polyps within the middle ear cavity. The infection often ascends from the nasopharynx, adenoids, paranasal sinuses, or oropharynx via the eustachian tube.² CSOM has a higher incidence

in developing countries and among individuals from lower socioeconomic backgrounds.³ Common causative organisms include *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and gram-negative bacilli such as *Proteus* spp., *Klebsiella* spp., *Escherichia coli*, *Haemophilus influenzae*, and *Moraxella catarrhalis*. Fungal pathogens like *Aspergillus niger* and *Candida* spp. are also implicated.⁴ CSOM can lead to significant morbidities, including hearing loss, recurrent infections, and potential complications such as mastoiditis, cholesteatoma, and intracranial infections.⁵ The management of CSOM typically involves a

combination of medical and surgical interventions and antibiotics are important in controlling infection and promoting healing of the middle ear infection. However, the irrational and inappropriate use of antibiotics can contribute to the emergence and spread of antimicrobial drug resistance, which is a global public health concern.⁶ Irrational drug prescribing practices can result in medication errors, serious adverse events and increased treatment costs. It is especially concerning in developing countries like India.⁷ Antimicrobial resistance can be addressed with judicious antimicrobial prescribing practices.⁸ Drug utilization monitoring can be used to assess the rational use of drug therapy, the outcome of treatment, and the quality of care.⁹ So, the present study was planned to analyse the prescribing patterns of antimicrobials and other drugs in patients diagnosed with CSOM attending the outpatient department of a government tertiary care hospital in Jaipur City.

MATERIAL AND METHODS

Study Design and duration: This was a descriptive, observational, hospital-based, prospective study.

Study Location and Duration: The study was carried out in the Department of Otorhinolaryngology, Sawai Man Singh (SMS) Medical College & Hospital, Jaipur, over a period of 15 months, from February 2024 to April 2025 after obtaining permission from the institutional Ethics Committee [Ref:28 MC/EC/ 2023]

Study Population: The study population comprised patients clinically diagnosed with Chronic Suppurative Otitis Media (CSOM) attending the ENT Outpatient Department (OPD) and receiving at least one prescription drug.

Inclusion Criteria: a) Adult patients (≥ 18 years) of either sex diagnosed with CSOM, with or without active recurrent otorrhea, and with visible tympanic membrane perforation, b) Patients willing to provide written informed consent to participate in the study.

Exclusion Criteria: a) Patients with non-infective ear conditions (e.g., malignancy, trauma due to road traffic accidents), b) Patients with aural discharge from causes other than CSOM (e.g., foreign body, furunculosis, post-operative cases), c) Patients with co-morbid systemic illnesses such as cancer, HIV infection, or viral hepatitis.

Sample Size: The sample size was calculated based on the expected prevalence of antimicrobial prescribing in CSOM patients

reported in earlier studies, with a confidence level of 95% and an allowable error of 5%.

Study Procedure:

Eligible patients were recruited consecutively after screening against inclusion and exclusion criteria. A structured proforma was used to collect demographic details, clinical features, and prescription data. All prescribed drugs, including systemic and topical antimicrobials, analgesics, antihistamines, and other adjunctive medications, were recorded. Prescribing trends were assessed in terms of drug class, frequency, dosage form, route of administration, and duration of therapy. All the prescriptions were assessed for WHO core prescribing indicators.

Statistical Analysis:

The collected data were entered into Microsoft Excel and analyzed using SPSS (Statistical Package for the Social Sciences) version 24. Descriptive statistics were applied, and results were expressed as frequency, percentage, mean, and standard deviation (SD). Chi-square test was applied for categorical variables. P-value of <0.05 was considered statistically significant.

RESULTS

A total of one hundred patients were enrolled, out of which 62% were females and 38% were males. 44% of the study population were in the age group of 31-45 years, with 14 males and 30 females. 25% of patients were aged between 18-30 years, including 11 males and 14 females. 16% of patients were aged >60 years, males 8 and females 8, 15% fell within the 46-60 years range, including males 5 and females 10. The mean age group was found to be 41.07 years, Table 1. The distribution of drugs prescribed by their therapeutic groups reveals that antimicrobials were prescribed to 220 (49.1%) patients, followed by antihistaminic to 92 (20.53%) as depicted in table 2. The data on WHO core prescribing indicators reveal several key prescribing trends which are depicted in Table 3. All the prescriptions included antibiotics and all the drugs were prescribed from National list of essential medicines 2022. Among the antimicrobials fluoroquinolones (Ciprofloxacin/ Ofloxacin) were prescribed to most of the patients (58.64%) as shown in Figure 1. A total of 448 drugs was prescribed to hundred patient. Most common route of administration was oral, accounting for 370 drugs (82.58%) while the topical route (including ear drops) was used for 78 drugs (17.41%).

Table 1: Socio-Demographic Characteristics of the Patients (N= 100)

Variables	Category	Frequency (%)	P Value
Sex	Male	38	
	Female	62	
Marital Status	Married	78	P<0.001
	Unmarried	22	
Age Group	18-30	25	P=0.529
	31-45	44	
	46-60	15	
	>60	16	
Educational Level	Illiterate	30	P<0.05
	Literate	70	
Occupation	Employed	55	P= 0.04
	Unemployed	45	

Table 2: List of Therapeutic Groups of Drugs Prescribed to the Patients (N=448)

Therapeutic Group of the Drugs Prescribed to the Patients	Frequency	Percentage
Antimicrobial Agents	220	49.1
Antihistamines	92	20.53
Non-Steroidal Anti-inflammatory Drugs (NSAIDs)	56	12.5
Nasal Decongestants	9	2.0
Steroids	7	1.56
Vitamins	23	5.13
PPIs	6	1.33
Others	35	7.81

Table 3: Analysis of the Prescriptions According to WHO Core Prescribing Indicators

Number of Prescriptions Analysed	100
Average number of drugs per encounter (Mean \pm SD)	4.48 \pm 1.167
Percentage of encounters with antibiotics prescribed	100%
Percentage of encounters with an injection prescribed	Nil
Percentage of drugs prescribed by generic name	100%
Percentage of drugs prescribed from National List of Essential Medicines (NLEM-2022)	100%

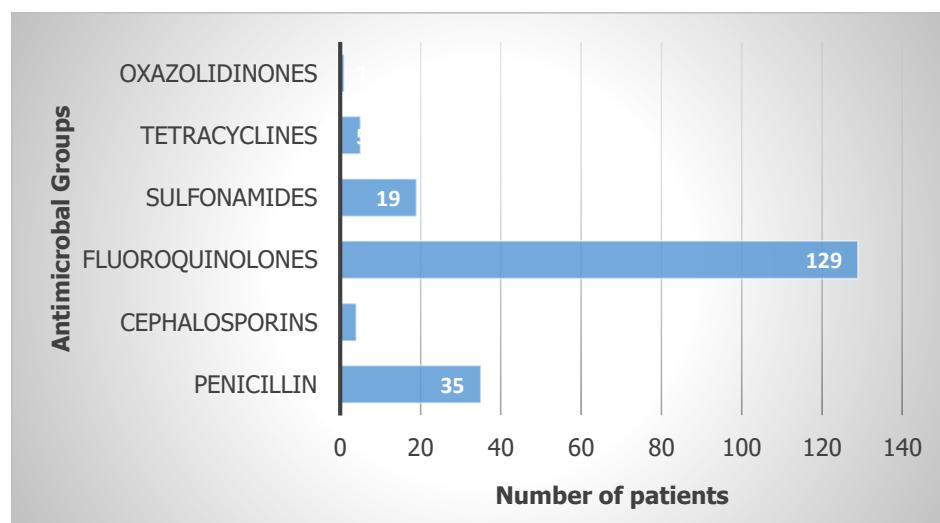


Figure 1: List of Therapeutic Group of Antimicrobial Prescribed (N= 193)

DISCUSSION

This study provides comprehensive insights into the socio-demographic characteristics and prescribing trends among CSOM patients attending the outpatient department of a government tertiary care hospital. The focus on both drug utilization and systemic antibiotic use allows for a detailed assessment of therapeutic trends, with important implications for rational drug use and antimicrobial stewardship. The patient population comprised 62% females and 38% males, consistent with prior studies reporting higher healthcare utilization by women, particularly for otolaryngological conditions.¹⁰ Marital status was significantly associated with healthcare access ($p < 0.001$), with 78% of participants being married—indicating a potentially higher health-seeking behaviour among married individuals.

Age-wise, the most represented group was 31–45 years (44%), followed by 18–30 years (25%). This distribution suggests that adults in their prime working years are more affected or more likely to seek care, possibly due to lifestyle or occupational exposure. The mean age of patients in the study was 41.07 years, aligning with trends observed in otolaryngology infections such as chronic suppurative otitis media (CSOM) and allergic rhinitis.¹¹

From the 448 prescription drugs studied, antimicrobial agents dominated the therapeutic spectrum, comprising 49.1% of total drugs prescribed. This high proportion underscores the infectious nature of the presenting conditions—likely otitis media, pharyngitis, and sinusitis—commonly managed in otolaryngology clinics. The significant use of antihistamines (20.53%) and Non-steroidal anti-inflammatory drugs (NSAIDs, 12.5%) suggests a symptom-oriented approach to inflammation and allergy control, which is typical in upper respiratory tract management. Drugs such as nasal decongestants (2%), steroids (1.56%), and vitamins (5.13%) were less frequently used, indicating that adjunctive or supportive therapy played a secondary role. The prescription of proton pump inhibitors (PPIs, 1.33%) likely corresponds to gastroprotective strategies, particularly in patients receiving NSAIDs or antibiotics.

Similar results were mirrored in the previous study of Joshi U et al.¹² They studied 313 prescriptions and the most commonly prescribed class of drugs was antimicrobials (24.42%), followed by antihistamines

(18.84%), antiulcer drugs (15.55%), and NSAIDs (14.35%).

Among 220 antimicrobial prescriptions, fluoroquinolones (especially Ciprofloxacin and Ofloxacin) accounted for 58.64% contrary to a previous study of Ain MR et al,¹³ where beta lactam were the most frequently prescribed antimicrobials. Their widespread use is aligned with guidelines recommending them for otolaryngology infections due to broad-spectrum efficacy and favourable pharmacokinetics. However, this pattern is concerning in the context of antimicrobial resistance (AMR). The observed reliance on fluoroquinolones echoes global trends and raises the need for antimicrobial stewardship to prevent resistance escalation (WHO, 2023).

Beta-lactams, primarily amoxicillin and clavulanic acid, constituted 19.55% of prescriptions. Though recommended as first-line agents in upper respiratory infections, their lower use compared to fluoroquinolones may reflect prescribers' perceptions of efficacy or patient response history. Cephalosporins like cefixime were rarely used (1.82%).

Interestingly, oxazolidinones (Linezolid) and Sulphonamides were prescribed in 9.09% and 8.64% of cases, respectively. Notably, these were primarily used in 39 patients with documented drug resistance, indicating evidence-based, culture-guided prescription. The presence of resistant organisms requiring second-line or reserve antibiotics like Linezolid further emphasizes the importance of sensitivity testing before empirical therapy.

The findings underscore the critical need for rational antibiotic use, guided by local antibiograms and national/international guidelines. The high rate of fluoroquinolone use must be re-evaluated in light of AMR concerns. Ensuring regular antimicrobial sensitivity testing and incorporating antimicrobial stewardship programs in clinical settings is essential.

Furthermore, the statistically significant associations with education and employment indicate that social determinants of health continue to influence drug utilization and treatment adherence. Strategies to improve health literacy, especially among women and unemployed populations, should be integrated into healthcare delivery.

The assessment of WHO core prescribing indicators revealed that all the drugs (100%) were prescribed by their generic names in contrast to previous study of Mugada VK¹⁴ et

al which reported 33.0% usage of generic names. Furthermore, all drugs were prescribed by the National List of Essential Medicines (NLEM) 2022, indicating full adherence to standardized treatment protocols. This is contradictory to previous studies of Mugada et al¹⁴ and Sah BP et al¹⁵ where adherence to essential drug list prescribing was only 76.7% and 31.9% respectively.

Our study had few limitations that it was conducted in a single centre with a limited sample size, which may restrict the generalizability of findings. Moreover, long-term follow-up data on treatment outcomes and resistance development were not included, which could provide further clinical relevance.

CONCLUSION

The study demonstrates a significant inclination toward antimicrobial prescribing, especially fluoroquinolones, among middle-aged, literate, and predominantly female patients. Polypharmacy (average of 4.48 drugs per encounter) was evident, but there is complete adherence to generic prescribing and the National list of essential medicines (NLEM, 2022), indicating rational and standardized prescribing practices. Socio-demographic factors such as education and employment status were found to influence healthcare access and disease management. Targeted interventions focusing on antimicrobial stewardship and patient education are vital to improve prescribing patterns and combat emerging drug resistance.

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