



Original Article

Antibiotics Utilization in Otorhinolaryngology Department: An Insight from a Cross-sectional Study in a Tertiary Care Hospital

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ABSTRACT

Background: Rational antibiotic use is critical in Otorhinolaryngology (ENT) due to the high prevalence of both viral and bacterial upper respiratory tract infections (URTIs). Over-prescription contributes to antimicrobial resistance (AMR).

Objective: To evaluate the patterns of antibiotic prescription in the ENT outpatient department using WHO prescribing indicators.

Methods: A prospective, cross-sectional study was conducted over four months. Data from 891 patient encounters were analyzed for drug class, dosage form, and adherence to the WHO AWaRe classification.

Results: Out of 891 patients, 72% were prescribed at least one antibiotic. Beta lactams were the most frequent (54%), followed by macrolides (19%). The percentage of drugs prescribed by generic name was 100%.

Conclusion: There is a significant reliance on broad-spectrum "Watch" group antibiotics. Implementing antimicrobial stewardship (AMS) programs is essential to align prescribing habits with evidence-based guidelines.

Keywords: Antimicrobial resistance (AMR), Antimicrobial stewardship (AMS), Drug utilization pattern, Otorhinolaryngology, WHO AWaRe classification WHO prescribing indicators.

INTRODUCTION

Antibiotic resistance has become a serious global health threat in recent years due to its inappropriate use, overuse and incorrect use.^[1,2] Selection of antibiotic depends upon the infectious organism and its antibacterial susceptibility.^[3] Unsafe usage of antibiotic is harmful and also, risky in patients having an impaired immune system.^[4] ENT infections being frequent in the community, prudent use of antibiotics is necessary to prevent emergence of drug resistant bacteria.^[5] Few studies have found that, the pediatric and geriatric population are more prone to develop infections associated with ear, nose and throat. Hence, antibiotic prescription rate is high in the extreme age group.^[6] Periodic evaluation of prescribing behavior is essential in recognizing the current trend of practices and identifying the errors of omission & commission while prescribing a medicine.^[7,8] A variety of factors influence the antibiotic prescribing pattern, including physician preference and cost.^[9] Self-evaluation of pattern of antibiotic utilization using ICMR guideline will not only be helpful in assessing the quality and cost-effectiveness of antibiotic usage, but also guide us to select the optimal therapy for a patient depending upon the clinical need.^[10]

With this background, the present study was undertaken to evaluate the antibiotic drug usage pattern in otorhinolaryngology OPD in a tertiary care hospital and to find the prevalence of inappropriate use of antibiotic using WHO guidelines as reference.

METHODOLOGY

2.1 Study Design and Setting

This was a prospective, hospital-based cross-sectional study conducted at a tertiary care teaching hospital for a period of four months after obtaining IEC permission.

2.2 Inclusion and Exclusion Criteria

- **Inclusion:** Patients attending the Otorhinolaryngology OPD with some clinically diagnosed ENT diseases. [11]
- **Exclusion:** Patients with co-morbid conditions, and not willing to participate in the study. [12]

2.3 Data Collection and Indicators

Prior to collection of data, written informed consent was taken from each patient. The data were recorded in a pre-designed case record form through direct communication with patients and collecting their prescriptions. The demographic profile, clinical diagnosis, drug details and indication of drug usage were noted. [13]

The age and gender distribution of patients, types of various ENT diseases, commonly prescribed antibiotics, their routes of administration and frequency of usage were observed.

The prevalence of antibiotic use was found by screening the prescriptions for total no of antibiotic used and mean no of antibiotics per prescription.

The primary outcomes were measured using WHO Prescribing Indicators. [14]

1. Average number of drugs per encounter.
2. Percentage of drugs prescribed by generic name.
3. Percentage of encounters with an antibiotic.
4. Percentage of encounters with oral drugs
5. Percentage of encounters with injectable

Descriptive statistics was applied. Data were entered in Microsoft excel and analyzed by Statistical Package of Social Science (SPSS), version 16.

OBSERVATIONS AND RESULTS

The present work comprised of assessment of 891 patients, out of all, females outnumbered males (F:51.51% vs M:48.48%). Maximum number of patients were within the age group of 31-40 years followed by 21-30 yrs. Among all ENT cases (891), ear pathologies were found to be predominant. (432). (Table-1)

Of all the patients having some ear complains, chronic suppurative otitis media (39.5%) was the most common diagnosis followed by acute suppurative otitis media. (35.41%) and Otitis externa (25%). Out of 252 cases who presented with throat pathology, 50% patients had pharyngitis. The second common presentation was acute tonsillitis in 42.8% cases. Chronic tonsillitis was seen in 7.1% cases. Allergic rhinitis (39.1%) was the most common presentation among all nasal infections (207) followed by URTI (26.08%) and. Sinusitis (21.7%). The least common presentation was nasal vestibulitis (13%). (Table-1)

Table 1: Demographic and Clinical Profile of Patients (n=891)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	432	48%
	Female	459	52%
Department	Outpatient (OPD)	891	100%
	Inpatient (IPD)	0	0%
Diagnosis	Acute Tonsillopharyngitis	234	26%
	Chronic Suppurative Otitis Media	171	19%
	Acute Suppurative Otitis Media	153	17%
	Otitis Externa	108	12%

Table 2: WHO Prescribing Indicators

Indicators		WHO Ideal Value
Average number of drugs per encounter	2.7	1.6 – 1.8
Percentage of drugs by generic name	100%	100%
Percentage of encounters with antibiotics	72%	20.0% – 26.8%

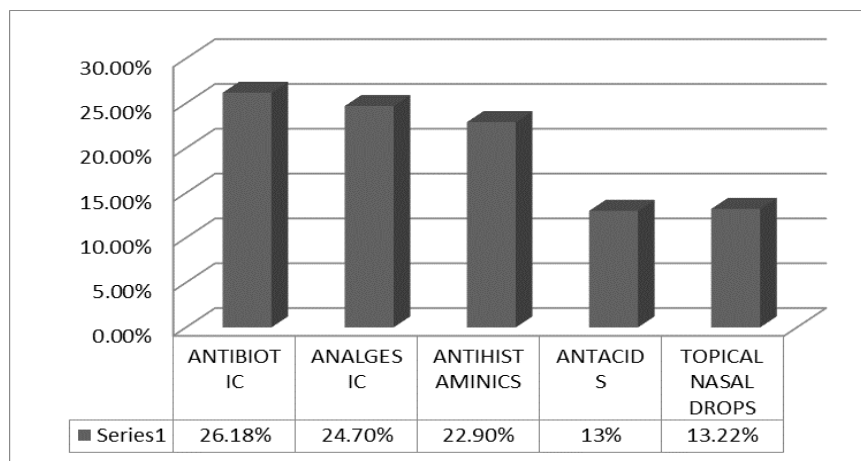


Figure1-Percentage of Different drugs prescribed

A total number of 2475 of drugs were prescribed to all patients enrolled. Commonly prescribed group of drugs were antibiotics (26.18%), analgesics (24.7%), antihistaminic (22.9%), antacids (13%), and nasal drops (13%). (Fig-1)

On analyzing all the prescriptions (891), it was found that ,648 (72.72%) prescriptions contained antibiotic drug. In all 648 (100%) prescriptions, single antibiotic drug was advised. Total number of antibiotics prescribed were 648 and average number of antibiotics per prescription was found to be 0.7. (Table-2)

Average number of drugs per prescription was 2.7. All the drugs (100%) were prescribed in generic name. Percentage encounter with one or more antibiotic was 72.72%. (Table-2) Out of 2475 drugs,1971(79.63%) drugs were advised for oral administration.468 (18.9%) topical drugs in form of antibiotic ear drops, steroid mix ear drops and nasal drops were prescribed. Only 36(1.4%) injectables were advised. Most of the antibiotics (72.22%) were prescribed for oral administration. Only 22.22% topical antibiotics and 5.5% injectables were advised.

Among the antibiotic drugs (648), beta lactams (54.1%) were most commonly prescribed followed by macrolides (18%) and fluroquinolones (16.6%). Aminoglycosides (6%) and oxazolidinones (4.1%) were least commonly advised (4.1%). (Fig-2)

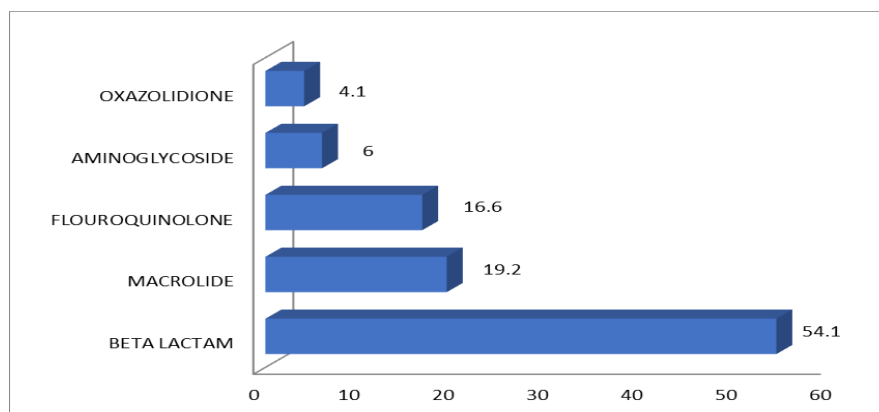


Figure 2-Percentage of Antibiotics prescribed

Table 3: Pattern of Antibiotics Prescribed (WHO AWaRe Classification)

Antibiotic Class	Specific Drug	Frequency (n)	Percentage (%)	AWaRe Category
Penicillin	Amoxicillin + Clavulanate	90	13.89	Access/ Watch
Macrolides	Azithromycin	81	12.50	Watch
Cephalosporins	Cefixime	63	09.72	Watch
Fluroquinolones	Ciprofloxacin	72	11.11	Watch

Amoxicillin (28.2%) was found to be the most common prescribed beta lactam followed by amoxicillin with clavulanic acid (25.6%) and cefixime (17.9%). Among macrolides, azithromycin (69.2%) was frequently advised followed by clarithromycin (30.7%). Ciprofloxacin (66.66%) and ofloxacin (33.33%) were mostly advised among the fluoroquinolones. From aminoglycoside class, neomycin (100%) was prescribed. Only linezolid (100%) was advised from oxazolidinones class. (Table-3)

About 27.7% antibiotics were used as combination therapy. Amoxiclav (50%), cefpodoxime with clavulanic acid (25%), ceftriaxone with sulbactam (10%), piperacillin with tazobactam (10%) and ofloxacin with ornidazole (5%) were among them.

DISCUSSION

This was a prospective observational study, which was conducted in the ENT department of a tertiary care hospital. The source of data for the current study involved prescriptions of patients suffering from an ENT condition. The present study reveals the general trend of prescribing pattern of antibiotics in the ENT OPD.

A total of 891 prescriptions were analyzed. Among them, 459 (51.51%) were of females and 432 (48.48%) were of males. Similar female predominance was also seen by Daniel M et al and Islam B et al. [11,15] This could be attributed to exposure of females to smoke during cooking, making them more sensitive to infection as compared to males. However, according to Bhat GMN et al. [1] maximum ENT infections are seen in males.

Maximum number of patients were seen between 21-40 yrs of age group in our study. Also, Ziaie T et al. [16] have made similar observation in their study.

In this study, ear pathologies were predominant among all ENT conditions followed by throat and nose pathologies. A study done by Yadav et al. [17] shows higher incidence of ear infection followed by throat and nose, which is similar to our study. In our study, chronic suppurative otitis media was the most common diagnosis among ear pathologies followed by acute suppurative otitis media and otitis externa. Similar observation was also made by Ziaie T et al. [16] Among nose pathologies, allergic rhinitis and URTI cases were common in our study. Cases of pharyngitis and tonsillitis were frequently seen in our study with throat conditions. This finding correlates well with the study carried by Suman RK et al. [18]

On analyzing all the prescriptions (891), it was found that 648 (72.72%) prescriptions contained antibiotic drug. This is substantially higher than the WHO recommended limit of 20–27% suggesting a regional culture of "defensive prescribing" where clinicians prescribe antibiotics to prevent secondary bacterial infections, even when a viral etiology is suspected in all antibiotic containing prescriptions (100%), monotherapy was used. Ingel SA et al. [19] had found similar observation in 87% prescriptions. In contrast, only 57% prescriptions contained single antibiotic drug in a study done by Islam B et al. [15] Total number of antibiotics prescribed were 648 and average number of antibiotic per prescription was found to be 0.7 in the present study which is less as compared to findings by Khan et al, Pal et al. and Beg et al, that show average number of antibiotic per prescription as 1.38, 1.49 and 1.64, respectively. [12,20,21] As most of the antibiotics were prescribed empirically multiple antibiotics were not advised to avoid resistance and side effects.

Beta lactam group of drugs were the most common antibiotic prescribed in this study followed by macrolides and fluoroquinolones. This corroborates well with the studies done by Sridevi SA et al. [10] and Pal et al. [20], whereas study conducted by Khan et al. [12] revealed that, most commonly used were beta lactams, followed by aminoglycosides and macrolides. Macrolides were found to be most frequently advised in the studies by Ingle SA et al. [19] Among the beta lactams, amoxicillin was frequently prescribed followed by amoxiclav and cefixime. Similar prescription pattern was also observed by Ziaie T et al. [16]. Azithromycin was most frequently advised macrolide in our stud. Among fluoroquinolones, ciprofloxacin was mostly prescribed as topical drop. followed by ofloxacin. This is in accordance to the finding of Islam B et al. [15] Commonly used fixed dose combination drugs in our study were amoxicillin + clavulanic acid followed by cefpodoxime + clavulanic acid. This is in contrast to the finding of Kumari N et al. [15], where cefpodoxime combination was frequently used followed by amoxicillin combination. Broad spectrum antibiotics were advised in our study to provide cover to maximum number of causative micro-organisms.

In our study, it was observed that most of the antibiotics (72%) were prescribed for oral administration followed by topical route. It aligns with the study done by Kishore Kumar Y et al. [23] As patients were included from OPD, maximum number of drugs were prescribed orally.

A total of 2475 drugs were found in 891 prescriptions. Along with antibiotics (26.18%), other drug categories such as analgesics (24.7%), antihistaminic (22.9%), antacids (13%), and nasal drops (13%) were prescribed in our study. Similar concomitant group of drugs were also found to be prescribed in the studies done by Islam B et al. [15] and Suman RK et al. [18] All these drugs play important role in ENT disorders.

Antibiotics were the most common prescribed drugs in our study followed by analgesics and antihistaminic. This aligns with the finding of Rehan HS. [24] However, Ingles SA et al (19) reported antihistaminic as the most commonly prescribed drug in their study.

Polypharmacy is related to adverse drug reaction, drug interaction, increased cost and development of bacterial resistance.[25] The average number of drugs per prescription in our study was 2.7, which is consistent with the studies done in Brazil [26] and Nepal [27], where it was 2.4 and 2.91 respectively. Various other studies have reported average number of drugs per prescription as more than 3. [5,10,15,18,22,23] It is preferable to keep this value as low as possible to avoid polypharmacy.

All the drugs (100%) were prescribed in generic name in this study. Similar trend was found in study done by Isaac. [28] and Silfwerbrand et al. [29], where most of drugs were prescribed by its generic name. Generic drugs are cheaper than branded drugs making them accessible to all patients. This is in contrast to the findings of Rehman et al. [5], Sridevi SA et al. [10], Daniel M et al. [11], Begum MM et al. [13], Islam B et al. [15], Suman RK et al. [18], Kumari N et al. [22] Kishore Kumar Y et al [23], where brand names were mostly prescribed. This could be due to physician's trust over brands, better availability and good patient compliance.

In our study, percentage encounter with antibiotic was 72.72%. In contrast to this finding, Rehman et al. [5] and Suman RK et al. [18] had observed percentage encounter with an antibiotic as 47% and 32% respectively. It could be attributed to increased occurrence of ENT related infections in our geographical area.

In our study, 79.63% drugs were advised for oral administration and 18.9% drugs for topical application. Only 1.4% injectables were advised. Similar observation was also made by Rehman et al. [5] and Kishore Kumar Y et al. [23]

No case of adverse drug reaction was reported in the present study. Format of prescriptions in relation to dose, duration and frequency was complete in 100% prescriptions.

Despite providing insights into the various aspects of drug prescribing pattern, quality of use and determinants of use, this study has got few limitations. The quality of diagnosis and appropriateness of drug choices were beyond the scope of the study, Pharmacovigilance could have been noticed, which was nil during the study period.

CONCLUSION

From our observation in this study, it may be concluded that, the overall pattern of antibiotic utilization in ENT OPD was appropriate in many aspects as per the guidelines. All efforts were made to improve the quality of health care.

To combat AMR, we recommend:

- Antimicrobial Stewardship (AMS): Implementing "Antibiotic Time-outs" to review therapy after 48 hours.
- Point-of-Care Testing: Using Rapid Antigen Detection Tests (RADT) for Group A Strep to differentiate viral from bacterial pharyngitis.
- Continuous Medical Education: Training residents on the WHO AWaRe classification.

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Conflict of interest

All authors have declared that no financial support was received from any organization for the submitted work and they have no financial relationships with any organization that might have an interest in the submitted work. There are no other relationships or activities that could appear to have influenced the submitted work.

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