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EVALUATION OF ANTIBIOTIC PRESCRIBING PATTERNS FOR ACUTE OTITIS MEDIA IN ENT DEPARTMENT OF A TERTIARY CARE HOSPITAL

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ABSTRACT

Background

Particularly in children under five, Acute Otitis Media (AOM) is a common and serious health problem that is a major contributor to the prescription of antibiotics in outpatient settings. Antibiotics are commonly prescribed without adequate diagnostic confirmation, despite the fact that many cases are viral and self-limiting. This contributes to the growing issue of antimicrobial resistance (AMR). Though differences in prescribing practices continue to exist across healthcare settings, clinical guidelines advise a more conservative approach in non-severe cases. To encourage sensible antibiotic use and improve antimicrobial stewardship, it is imperative to assess these trends.

Aim

The aim of this study was to determine possible areas for antimicrobial stewardship improvement by analyzing the antibiotic prescribing patterns for AOM (Acute Otitis Media) in the ENT department of a tertiary care hospital and their compliance with accepted clinical guidelines.

Methodology

300 patient records with an AOM diagnosis were the subject of this retrospective cross-sectional study which was conducted between June 2024 to December 2024. We gathered and examined information on demographics, antibiotic prescriptions, dosage, route, and duration. The American Academy of Paediatrics and World Health Organization's established guidelines were used to evaluate prescribing patterns.

Result

Out of the 300 patients, 40% were children younger than five. The most often prescribed antibiotics were amoxicillin (36.7%) and amoxicillin-clavulanic acid (16.7%). Most patients (60%) received antibiotics for 6–7 days, and 86.7% preferred oral administration. 61.7% of prescriptions were found to be in compliance with treatment guidelines, whereas 38.3% displayed partial or total non-compliance, which included prolonged therapy and excessive use of broad-spectrum antibiotics

Conclusion
While the majority of antibiotic prescriptions adhered to recommended practices, there are some notable exceptions that could lead to antibiotic resistance. To encourage sensible antibiotic use in AOM management, improved antimicrobial stewardship and clinician education are essential.

Keywords: Acute Otitis Media, Antibiotic Prescribing Patterns, Antimicrobial Stewardship, Amoxicillin, Broad-Spectrum Antibiotics, ENT Department, Paediatric Infections.

INTRODUCTION

Although it primarily affects children under five, AOM is a common and serious health issue that can affect people of all ages. It is distinguished by the quick onset of middle ear infection and inflammation symptoms, such as fever, irritability, ear pain, and occasionally otorrhea.[1] AOM is a major cause of paediatric consultations and therapeutic interventions in otolaryngology and general practice worldwide, accounting for a significant portion of outpatient visits and antibiotic prescriptions.[2]

The treatment of AOM is still debatable despite its high incidence, particularly when it comes to the use of antibiotics. Antibiotics are frequently prescribed empirically without sufficient diagnostic confirmation, despite the fact that AOM is often viral in origin and self-limiting in many cases.[3] Concern over the excessive and inappropriate use of antibiotics has grown over the past few decades, as it plays a major role in the global threat of AMR (Antimicrobial Resistance). AMR is one of the top ten global public health threats that humanity is currently facing, according to the WHO (World Health Organisation), and it is mostly caused by the overuse and abuse of antibiotics.[4]

In non-severe cases, particularly in children older than two, these guidelines generally support a watchful waiting approach and, when required, suggest particular antibiotics, dosages, and treatment durations.[1] But in practice, different healthcare settings and specialities continue to adhere to these guidelines differently.[5]

Additionally, analysing prescription trends can reveal patterns of resistance and the common microbial aetiology, both of which are crucial for guiding regional antibiotic policies. This is particularly crucial in tertiary care hospitals, where antibiotic stewardship programs need to be customised to meet departmental needs and patients with more complex or recurring infections are frequently referred.[6]

Apart from its immediate symptoms, AOM is linked to side effects like mastoiditis, tympanic membrane perforation, and hearing loss, which can hinder children's language development and academic achievement.[7] Even though it occurs less frequently in adults, improper management of AOM can result in major complications.

The primary clinical diagnosis of AOM is frequently made in the presence of symptoms like fever, irritability, otalgia, and signs like otorrhea or a bulging tympanic membrane. Antibiotics may be overused or underused as a result of misdiagnosis caused by variations in clinical judgement and insufficient use of otoscopic confirmation.[8] AOM is among the top three conditions for which antibiotics are prescribed in outpatient settings, according to the CDC (Centres for Disease Control and Prevention); however, a significant number of these prescriptions are either unnecessary or inappropriate.[9]

There has been much discussion about the use of antibiotics for AOM. Antibiotics were frequently used as first-line therapy in the past, but new research indicates that many cases of AOM, particularly in older children and those with mild symptoms, resolve on their own without the need for antimicrobial treatment.[3,10]

MATERIALS & METHODS

This was a hospital-based, retrospective cross-sectional study conducted in the Department of Otorhinolaryngology (ENT) of a tertiary care teaching hospital between June 2024 to December 2024. The study included a total of 300 patient records diagnosed with AOM. These patients were either outpatients or inpatients who received care from the ENT department.

Inclusion Criteria
- Patients of all ages and both genders diagnosed clinically with AOM.
- Patients who were prescribed at least one antibiotic during the treatment course.
- Complete patient records available for review including prescription details.

Exclusion Criteria
- Patients diagnosed with chronic otitis media or otitis externa.
- Patients with incomplete medical records or missing prescription data.
- Patients who received treatment outside the ENT department.

Data Collection Method
Data were collected retrospectively from the hospital's medical records database and prescription logs. A standardized data collection form was used to extract the following information Demographic details (age, sex), Clinical diagnosis,

Symptoms and severity, Antibiotic(s) prescribed, Dosage, frequency, route, and duration of therapy, Use of adjunct medications (e.g., analgesics, antihistamines), Follow-up data, if available.

Evaluation Criteria
Antibiotic prescribing patterns were analyzed in terms of:
- Type of antibiotics prescribed (e.g., amoxicillin, cephalosporins, macrolides)
- Frequency of empirical versus culture-guided prescriptions
- Compliance with national/international treatment guidelines (e.g., AAP, WHO)
- Use of broad-spectrum vs. narrow-spectrum antibiotics

Ethical Considerations
The study was approved by the Institutional Ethics Committee. As this was a retrospective study using anonymized patient data, the requirement for informed consent was waived.

RESULTS
A total of 300 patient records diagnosed with Acute Otitis Media (AOM) were reviewed. The demographic and prescribing patterns are summarized below.
A total of 300 patients with an ENT diagnosis of Acute Otitis Media (AOM) from a tertiary care hospital were included in the retrospective analysis. According to the demographic profile, children under the age of five, who made up 40% of the study population, had the highest prevalence of AOM. 30% of adults were between the ages of 19 and 60, whereas 20% and 10% of adults were between the ages of 5 and 18 and over 60, respectively. Males made up slightly more cases (56.7%) than females (43.3%).
The most often prescribed class of antibiotics was penicillin derivatives, although prescription patterns varied. The most common antibiotic, amoxicillin, was administered to 36.7% of patients, with amoxicillin-clavulanic acid coming in second with 16.7% of cases. Cephalosporins, such as cefuroxime and cefixime, were prescribed in 10.0% and 13.3% of cases, respectively. 8.3% of patients used macrolides like azithromycin, mostly those who had previously been exposed to antibiotics or had a penicillin allergy. 6.7% of prescriptions were for fluoroquinolones, most notably ciprofloxacin, which was typically given for recurrent infections or suspected bacterial resistance. Cotrimoxazole and other antibiotics were administered to the remaining 8.3% of patients.

Because the majority of cases were outpatient, oral therapy was the most popular route of administration (86.7%). In 13.3% of cases, intravenous antibiotics were saved for hospitalised patients or more severe presentations.

In accordance with current clinical recommendations, the majority (60%) of patients received antibiotic therapy for 6 to 7 days, which also followed typical patterns. Nonetheless, 10% of patients received therapy for five days or less, and 30% of patients were prescribed antibiotics for more than seven days, suggesting some irregularity in treatment duration.

The assessment of adherence to established treatment guidelines was a significant component of the research. 61.7% of prescriptions were found to be completely compliant with national and international guidelines, including those issued by the WHO (World Health Organisation) and the AAP (American Academy of Paediatrics). Nevertheless, 16.6% were judged non-compliant and 21.7% were only partially compliant, which may be due to improper durations, excessive use of broad-spectrum antibiotics, or departures from first-line treatments.

All things considered, the findings show a moderate degree of compliance with advised prescribing procedures. The fact that partial and non-compliance is present in more than one-third of cases, however, emphasises the necessity of better implementation and awareness of guidelines in addition to continuous monitoring through antimicrobial stewardship initiatives.

Variable		Frequency (n)	Percentage (%)
Age Group	<5 years	120	40.0%
	5–18 years	60	20.0%
	19–60 years	90	30.0%
	>60 years	30	10.0%
Gender	Male	170	56.7%
	Female	130	43.3%

Table 1: Demographic Characteristics

Antibiotic Class	Specific Drug	Frequency (n)	Percentage (%)
Penicillins	Amoxicillin	110	36.7%
	Amoxicillin + Clavulanic Acid	50	16.7%
Cephalosporins	Cefuroxime	40	13.3%
	Cefixime	30	10.0%
Macrolides	Azithromycin	25	8.3%
Fluoroquinolones	Ciprofloxacin	20	6.7%
Others (e.g. Cotrimoxazole)		25	8.3%

Table 2: Antibiotics Prescribed

Route	Frequency (n)	Percentage (%)
Oral	260	86.7%
Intravenous	40	13.3%

Table 3: Route of Antibiotic Administration

Duration (Days)	Frequency (n)	Percentage (%)
≤ 5 days	30	10.0%
6–7 days	180	60.0%
>7 days	90	30.0%

Table 4: Duration of Antibiotic Therapy

Compliance Status	Frequency (n)	Percentage (%)
Fully compliant	185	61.7%
Partially compliant	65	21.7%
Non-compliant	50	16.6%

Table 5: Compliance with Guidelines

DISCUSSION

With an emphasis on following clinical recommendations and using antibiotics sparingly, this study sought to assess the ENT department's antibiotic prescribing practices for AOM in a tertiary care hospital. Even though most prescriptions followed guidelines, a significant percentage either partially or completely deviated, which raises questions regarding antimicrobial stewardship.

Because of its effectiveness and safety profile, amoxicillin is advised as the first-line treatment for uncomplicated AOM, per international guidelines like those issued by the World Health Organisation and the American Academy of Paediatrics.[11] In accordance with these recommendations, the most commonly prescribed antibiotic in this study was amoxicillin, either by itself or in combination with clavulanic acid. The empirical use of broader-spectrum agents, such as cephalosporins and fluoroquinolones, in more than 30% of cases, however, points to a trend towards unnecessary antibiotic therapy escalation.[12] Clinical uncertainty, anticipated or perceived bacterial resistance, or outside pressures like parental expectations-factors that have been extensively noted in paediatric outpatient and ENT settings-are frequently the driving forces behind this practice.[13]

Interestingly, our study found that 38.3% of prescriptions did not fully adhere to current treatment guidelines. This result is consistent with other studies conducted in India and around the world that show non-adherence rates between 25% and 50%.[14] The growing global threat of antimicrobial resistance (AMR), which is especially acute in low- and middle-income countries where antibiotic stewardship and surveillance systems are still in their infancy, is directly caused by the inappropriate use of antibiotics, particularly those with a broad spectrum.[15]

The length of therapy also varied widely. About 30% of patients received antibiotic prescriptions for longer than the suggested five to seven-day course. According to recent data, shorter courses are typically adequate for treating uncomplicated AOM, particularly in older adults and children, and they also reduce treatment costs, side effects, and resistance.[16] The need for continuous education and more rigorous adherence to clinical protocols is further highlighted by the length of overprescription. Positively, 87% of cases preferred oral over parenteral administration, which is in line with standard treatment guidelines that recommend oral delivery for mild to moderate AOM because it is convenient and effective.[17] Nonetheless, the 13.3% of cases that required intravenous antibiotics-likely as a result of hospitalisation or a severe clinical presentation-showcases the significance of adjusting treatment to the patient's condition and clinical severity.[18]

Demographically, the highest incidence of AOM was observed in children under five years of age, reaffirming the known susceptibility of this age group due to anatomical and immunological immaturity.[19] The gender distribution was fairly balanced, despite a slight male predominance, which is in line with results from earlier research on paediatric otitis media.[20]

The study has limitations even though it offers insightful information. Due to its retrospective nature, it was reliant on the completeness and accuracy of medical records. Additionally, because it was limited to a single tertiary care facility, the findings may not be as generalisable to primary care or rural healthcare settings, where prescribing practices and diagnostic resources may differ greatly.

CONCLUSION

While the majority of antibiotic prescriptions for AOM in a tertiary care hospital's ENT department follow established guidelines, this study shows that a sizable portion still involve the inappropriate use of broad-spectrum antibiotics and longer-than-recommended treatment durations. Antimicrobial resistance and higher healthcare expenses are risks associated with these prescribing practices. Optimising antibiotic use requires strengthening adherence to evidence-based guidelines through regular prescription audits, clinician education, and targeted antimicrobial stewardship programs.

Furthermore, raising patient and healthcare provider awareness of appropriate antibiotic prescribing practices can improve clinical outcomes and lessen the threat of antibiotic resistance worldwide.

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