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Prescription Pattern and Rationality of Antimicrobial Use in a Tertiary Care Hospital

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ABSTRACT

Background: Inappropriate antimicrobial use is a major contributor to antimicrobial resistance, treatment failure, adverse drug reactions, and increased healthcare costs. Regular evaluation of antimicrobial prescribing helps identify irrational practices and supports antimicrobial stewardship activities in hospital settings. This study is designed to assess the prescription pattern and rationality of antimicrobial use among patients treated in a tertiary care hospital.
Materials and Methods: This hospital-based observational study was conducted among patients who received at least one antimicrobial agent during the study period. Prescriptions were reviewed for patient details, clinical diagnosis, antimicrobial class, route of administration, dosage, duration, use of fixed-dose combinations, culture-sensitivity testing, and adherence to standard treatment guidelines. Rationality was assessed using WHO prescribing indicators and institutional antimicrobial policy.
Results: A total of 300 prescriptions were analysed. The mean number of drugs per prescription was 4.8, while the mean number of antimicrobials per prescription was 1.7. Single antimicrobial therapy was prescribed in 58.3% of cases, whereas 41.7% received two or more antimicrobials. The most commonly prescribed antimicrobial class was cephalosporins (38.6%), followed by penicillins with beta-lactamase inhibitors (21.4%), fluoroquinolones (13.2%), nitroimidazoles (10.5%), and macrolides (6.8%). Injectable antimicrobials were used in 62.0% of prescriptions. Empirical therapy was noted in 72.3% of cases, while culture-guided therapy was documented in 27.7%. Antimicrobials were prescribed by generic name in 64.6% of prescriptions, and 81.3% were from the National List of Essential Medicines. Overall, 74.0% of prescriptions were considered rational, while 26.0% showed one or more irrational practices, mainly unnecessary broad-spectrum use, inappropriate duration, and lack of microbiological confirmation.
Conclusion: The study showed that antimicrobial use was largely empirical, with cephalosporins being the most frequently prescribed class. Although most prescriptions were rational, a considerable proportion showed avoidable prescribing errors. Strengthening antimicrobial stewardship, promoting culture-based therapy, and regular prescription audits are essential to improve rational antimicrobial use.

***Keywords**: Antimicrobial use; Prescription pattern; Rational drug use; Antimicrobial stewardship; Tertiary care hospital.*

INTRODUCTION

Antimicrobial agents are among the most frequently prescribed medicines in hospital practice and remain essential for the treatment of bacterial, fungal, parasitic, and selected viral infections. Their timely and appropriate use reduces morbidity, prevents complications, shortens hospital stay, and saves lives. At the same time, antimicrobials are unlike many other medicines because their misuse affects not only the individual patient but also the wider community. Every unnecessary dose, inappropriate combination, inadequate duration, or incorrect selection of an antimicrobial can exert selective pressure on microorganisms and contribute to the emergence of antimicrobial resistance [1,2].

Antimicrobial resistance has become one of the most serious public health threats of the present century. The global burden of bacterial antimicrobial resistance was estimated to be associated with 4.95 million deaths in 2019, of which 1.27 million deaths were directly attributable to resistant bacterial infections [1]. This burden is particularly important in low- and middle-income countries, where infectious diseases are common, access to microbiological diagnostics may be limited, and broad-spectrum antimicrobials are often used empirically [3]. In India, the problem is further intensified by high patient load, over-the-counter access to antibiotics in some settings, self-medication, incomplete courses, variable prescription practices, and inconsistent implementation of antimicrobial stewardship activities [4,5].

Hospitals, especially tertiary care centres, play a central role in antimicrobial consumption. Patients admitted to tertiary hospitals often have severe infections, multiple comorbidities, prior antimicrobial exposure, invasive procedures, and prolonged hospital stay. These factors increase the likelihood of receiving broad-spectrum or multiple antimicrobial agents. While such treatment may be justified in critically ill patients, inappropriate empirical therapy, prolonged surgical prophylaxis, unnecessary injectable use, duplication of antimicrobial coverage, and failure to de-escalate after culture results are common concerns in clinical practice [6,7]. These prescribing patterns not only increase the risk of resistance but also expose patients to adverse drug reactions, Clostridioides difficile infection, drug interactions, nephrotoxicity, hepatotoxicity, and avoidable treatment costs [8,9].

Rational antimicrobial use means selecting the right drug for the right patient, at the correct dose, by the appropriate route, for an adequate duration, and at the lowest reasonable cost. The concept also includes microbiological confirmation whenever possible, review of empirical therapy after clinical response or culture reports, and avoidance of unnecessary antimicrobial combinations [10]. The World Health Organization has emphasized rational drug use and has developed prescribing indicators to assess the quality of prescriptions in healthcare settings [11]. In addition, the WHO Access, Watch, and Reserve classification provides a practical framework for antibiotic selection and monitoring. Access antibiotics are generally recommended as first- or second-line treatment for common infections, Watch antibiotics have higher resistance potential and require careful use, and Reserve antibiotics should be protected for selected multidrug-resistant infections [12,13].

Prescription pattern studies are useful because they provide a clear picture of real-world antimicrobial use. They help identify the commonly prescribed antimicrobial classes, the frequency of monotherapy and combination therapy, the proportion of injectable use, the extent of generic prescribing, adherence to essential medicine lists, and the use of culture sensitivity testing [14]. Such studies also help detect irrational practices, including unnecessary broad-spectrum therapy, inappropriate dose adjustment, excessive duration, incorrect route, and use of antimicrobials without a documented indication [15]. Regular prescription audits are therefore an important part of antimicrobial stewardship and hospital quality improvement.

Antimicrobial stewardship programmes aim to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use. Core stewardship strategies include formulary restriction, prospective audit and feedback, treatment guideline implementation, dose optimization, de-escalation, intravenous-to-oral switch, and education of prescribers [16,17]. Evidence from hospital-based interventions has shown that stewardship programmes can improve antibiotic prescribing, reduce inappropriate antimicrobial exposure, and may contribute to better infection control without compromising patient safety [18]. However, successful implementation requires local data, because antimicrobial use differs between hospitals, departments, patient populations, and available diagnostic facilities.

In many tertiary care hospitals, empirical antimicrobial therapy remains common due to the need for early treatment, delayed laboratory reports, or limited availability of rapid diagnostics. Although empirical therapy is often clinically necessary, it should ideally be guided by local antibiograms, standard treatment guidelines, and periodic review. Without such review, empirical therapy may continue longer than required or may remain unnecessarily broad. Culture-guided therapy, wherever feasible, allows targeted treatment and supports antimicrobial conservation [19].

Therefore, evaluating prescription patterns and rationality of antimicrobial use is essential for understanding current prescribing behaviour and for identifying areas that require improvement. The present study was undertaken to assess antimicrobial prescription patterns in a tertiary care hospital, with special reference to commonly used antimicrobial classes, route of administration, generic prescribing, essential medicine list compliance, empirical and culture-based therapy, and overall rationality of prescriptions. The findings are expected to support evidence-based antimicrobial stewardship measures and promote safer, more effective, and more rational antimicrobial use in hospital practice.

MATERIALS AND METHODS

Study Design

This study was designed as a hospital-based, observational, cross-sectional study to assess the prescription pattern and rationality of antimicrobial use among patients attending a tertiary care teaching hospital. The study was planned to evaluate antimicrobial prescribing practices in routine clinical care without interfering with the treatment decisions of the treating physicians. The prescriptions were reviewed after they were issued, and the data were analysed to understand the type of antimicrobials used, route of administration, number of antimicrobials per prescription, use of generic names, inclusion in essential medicine lists, and rationality of antimicrobial therapy.

Study Setting

The study was conducted at Government Medical College, Maheshwaram, Rangareddy District, Telangana. The institution caters to patients from Maheshwaram and surrounding rural and semi-urban areas of Rangareddy district. As a tertiary care hospital, it receives patients from outpatient departments, inpatient wards, emergency services, and various clinical specialties. This setting provided a suitable environment to assess antimicrobial use across different clinical conditions and departments.

Study Duration

The study was carried out over a period of one year, from January 2025 to December 2025. During this period, prescriptions containing at least one antimicrobial agent were collected and reviewed according to the study protocol. The one-year duration was chosen to obtain a representative prescription pattern and to reduce seasonal variation in infectious disease presentation.

Study Population

The study population included patients of either sex and different age groups who received at least one antimicrobial agent during the study period. Prescriptions were included from outpatient and inpatient services wherever sufficient clinical and prescription details were available. Patients receiving antibacterial, antifungal, antiviral, or antiparasitic drugs were considered for analysis. Each eligible prescription was reviewed only once to avoid duplication of data.

Inclusion Criteria

Prescriptions of patients attending Government Medical College, Maheshwaram, during the study period were included if they contained at least one antimicrobial agent. Prescriptions with complete details regarding patient demographics, diagnosis or provisional diagnosis, antimicrobial name, dose, route, frequency, and duration were considered eligible. Both empirical and culture-guided antimicrobial prescriptions were included in the study.

Exclusion Criteria

Prescriptions that did not contain any antimicrobial agent were excluded from the study. Incomplete prescriptions, illegible prescriptions, duplicate prescriptions, and records with missing essential treatment details were not included. Patients who were referred to another centre before completion of initial evaluation and prescriptions written outside the hospital were also excluded. Topical antiseptics and disinfectants were not considered as systemic antimicrobial therapy for the purpose of this study.

Sample Size and Sampling Method

The sample size was selected based on the number of eligible antimicrobial prescriptions available during the study period and previous prescription audit studies conducted in similar tertiary care settings. A convenient sampling method was used, and prescriptions fulfilling the inclusion criteria were collected until the required sample size was achieved. Efforts were made to include prescriptions from different clinical departments to obtain a broader view of antimicrobial use in the hospital.

Data Collection Procedure

Data were collected using a predesigned and structured case record form. The information recorded included age, sex, inpatient or outpatient status, department, clinical diagnosis or provisional diagnosis, number of drugs prescribed, number of antimicrobial agents prescribed, antimicrobial class, individual antimicrobial name, dosage form, dose, route of administration, frequency, duration of therapy, and use of fixed-dose combinations. Details regarding culture and sensitivity testing, empirical or definitive therapy, and any change in antimicrobial therapy after laboratory reports were also recorded wherever available.

Assessment of Prescription Pattern

The prescription pattern was assessed by analysing the commonly prescribed antimicrobial classes and individual drugs. Antimicrobials were grouped into major classes such as cephalosporins, penicillins with beta-lactamase inhibitors, fluoroquinolones, macrolides, aminoglycosides, carbapenems, nitroimidazoles, antifungals, antivirals, and others. The number of antimicrobials per prescription, proportion of single and multiple antimicrobial therapy, frequency of injectable and oral antimicrobial use, and use of fixed-dose combinations were evaluated.

Assessment of Rationality

The rationality of antimicrobial use was assessed based on the documented clinical diagnosis, choice of antimicrobial, dose, route, frequency, duration, need for combination therapy, and availability of culture-sensitivity results. Prescriptions were considered rational when the antimicrobial selected was appropriate for the suspected or confirmed infection, prescribed in a suitable dose and duration, and used by an appropriate route. Prescriptions were considered irrational if there was no clear indication, unnecessary broad-spectrum coverage, inappropriate dose or duration, duplication of antimicrobial spectrum, avoidable injectable use, or lack of de-escalation when culture results were available.

WHO Prescribing Indicators

Selected World Health Organization prescribing indicators were used to evaluate the quality of prescribing. These included the average number of drugs per prescription, average number of antimicrobials per prescription, percentage of antimicrobials prescribed by generic name, percentage of prescriptions with injectable antimicrobials, and percentage of antimicrobials prescribed from the National List of Essential Medicines. These indicators helped in objectively assessing prescribing behaviour and identifying areas requiring improvement.

Ethical Considerations

The study was conducted after obtaining permission from the Institutional Ethics Committee of Government Medical College, Maheshwaram, Rangareddy District, Telangana. As the study involved prescription review and did not involve any direct intervention or change in patient treatment, the risk to participants was minimal. Patient identity and personal information were kept confidential. Data were recorded anonymously and used only for academic and research purposes.

Statistical Analysis

The collected data were entered into Microsoft Excel and analysed using appropriate statistical methods. Categorical variables such as sex, department, antimicrobial class, route of administration, empirical therapy, culture-guided therapy, and rationality of prescriptions were expressed as frequencies and percentages. Continuous variables such as age, number of drugs per prescription, and number of antimicrobials per prescription were expressed as mean and standard deviation. Associations between relevant categorical variables were analysed using the chi-square test where applicable. A p-value of less than 0.05 was considered statistically significant.

RESULTS

General Prescription Characteristics

A total of 300 antimicrobial prescriptions were analysed during the study period. The study population included patients from outpatient, inpatient, and emergency services. The mean age of the patients was 42.6 ± 16.8 years. The majority of prescriptions belonged to adults aged 21 to 60 years. Males constituted 166 cases (55.3%), while females accounted for 134 cases (44.7%). The mean number of drugs per prescription was 4.8 ± 1.6, and the mean number of antimicrobials per prescription was 1.7 ± 0.8. Single antimicrobial therapy was observed in 175 prescriptions (58.3%), whereas 125 prescriptions (41.7%) contained two or more antimicrobial agents (Table 1).

Table 1: Distribution of patients according to age, sex, and rationality of antimicrobial use

Variable	Total prescriptions, n (%)	Rational, n (%)	Irrational, n (%)	Chi-square value	p-value
Age group				3.97	0.265
≤20 years	48 (16.0)	37 (77.1)	11 (22.9)		
21 to 40 years	96 (32.0)	76 (79.2)	20 (20.8)		
41 to 60 years	92 (30.7)	67 (72.8)	25 (27.2)		
>60 years	64 (21.3)	42 (65.6)	22 (34.4)		
Sex				0.13	0.723
Male	166 (55.3)	121 (72.9)	45 (27.1)		
Female	134 (44.7)	101 (75.4)	33 (24.6)		

Values are expressed as number and percentage. Chi-square test was applied to compare rational and irrational prescribing across age groups and sex. A p-value <0.05 was considered statistically significant.

Department-wise Distribution of Prescriptions

The highest number of antimicrobial prescriptions was recorded from the Department of General Medicine, followed by General Surgery, Obstetrics and Gynaecology, Paediatrics, Orthopaedics, and ENT/other departments. Rational antimicrobial use was highest in Paediatrics (78.9%) and Obstetrics and Gynaecology (78.6%), while comparatively lower rationality was observed in Orthopaedics (67.6%). However, the difference in rationality across departments was not statistically significant (Table 2).

Table 2: Department-wise antimicrobial prescription pattern and rationality

Department	Total prescriptions, n (%)	Rational, n (%)	Irrational, n (%)	Chi-square value	p-value
General Medicine	92 (30.7)	68 (73.9)	24 (26.1)	2.59	0.763
General Surgery	66 (22.0)	46 (69.7)	20 (30.3)		
OBG	42 (14.0)	33 (78.6)	9 (21.4)		
Paediatrics	38 (12.7)	30 (78.9)	8 (21.1)		
Orthopaedics	34 (11.3)	23 (67.6)	11 (32.4)		
ENT and others	28 (9.3)	22 (78.6)	6 (21.4)		
Total	**300 (100.0)**	**222 (74.0)**	**78 (26.0)**		

Chi-square test was used to compare rationality of antimicrobial prescribing between departments. The difference was not statistically significant.

Pattern of Antimicrobial Classes Prescribed

Cephalosporins were the most frequently prescribed primary antimicrobial class, accounting for 116 prescriptions (38.7%). This was followed by penicillins with beta-lactamase inhibitors in 64 prescriptions (21.3%), fluoroquinolones in 40 prescriptions (13.3%), nitroimidazoles in 32 prescriptions (10.7%), and macrolides in 20 prescriptions (6.7%) (Figure 1). Aminoglycosides, carbapenems, and other antimicrobials together formed a smaller proportion of prescriptions. Ceftriaxone, amoxicillin-clavulanate, piperacillin-tazobactam, ciprofloxacin, metronidazole, and azithromycin were among the commonly prescribed individual agents (Table 3).

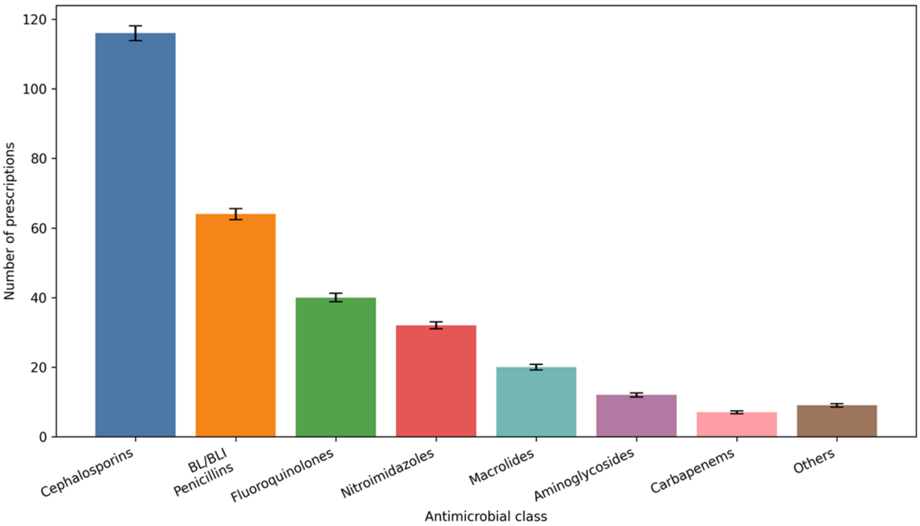

Figure 1: Distribution of prescribed antimicrobial classes with SEM error - Cephalosporins as the most commonly prescribed primary antimicrobial class

Table 3: Distribution of commonly prescribed primary antimicrobial classes

Antimicrobial class	Number of prescriptions	Percentage (%)
Cephalosporins	116	38.7
Penicillins with beta-lactamase inhibitors	64	21.3
Fluoroquinolones	40	13.3
Nitroimidazoles	32	10.7
Macrolides	20	6.7
Aminoglycosides	12	4.0
Carbapenems	7	2.3
Others	9	3.0
Total	**300**	**100.0**

The table shows the primary antimicrobial class prescribed in each prescription. Since this is a descriptive distribution table, chi-square testing was not applied.

Figure 2 shows the distribution of antimicrobial prescriptions according to the basis of therapy. Empirical antimicrobial therapy was used in 217 prescriptions, accounting for 72.3% of the total prescriptions, whereas culture-guided therapy was documented in 83 prescriptions, representing 27.7%. This finding indicates that most antimicrobials were initiated before microbiological confirmation. Although empirical treatment is often necessary in clinical practice, the lower proportion of culture-guided therapy highlights the need to strengthen microbiological testing and encourage early review of antimicrobial prescriptions once culture and sensitivity reports are available.

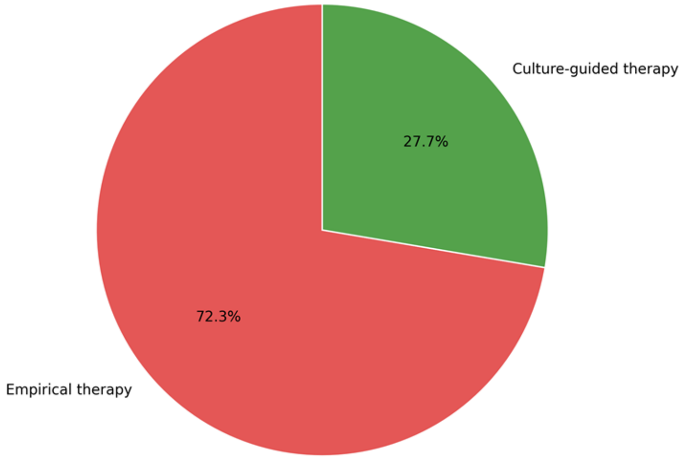

Figure 2: Empirical versus culture-guided antimicrobial therapy

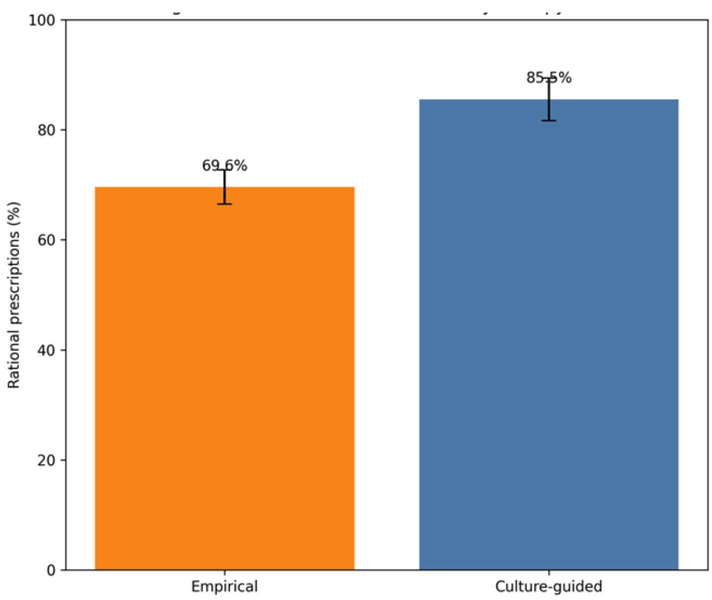

Figure 3: Rational antimicrobial use according to therapy

Route of Administration and Type of Therapy

Injectable antimicrobials were prescribed in 186 cases (62.0%), while oral antimicrobials were used in 114 cases (38.0%). Rational prescribing was slightly higher among oral prescriptions (80.7%) compared with injectable prescriptions (69.9%). This difference approached statistical significance but did not reach the conventional cut-off. Empirical antimicrobial therapy was documented in 217 prescriptions (72.3%), whereas culture-guided therapy was recorded in 83 prescriptions (27.7%). Rational use was significantly higher among culture-guided prescriptions (85.5%) compared with empirical prescriptions (69.6%) (Table 4).

Table 4: Association of route and type of therapy with rationality of antimicrobial use

Variable	Total prescriptions, n (%)	Rational, n (%)	Irrational, n (%)	Chi-square value	p-value
Route of administration				3.75	0.053
Injectable	186 (62.0)	130 (69.9)	56 (30.1)		
Oral	114 (38.0)	92 (80.7)	22 (19.3)		
Type of therapy				7.14	0.008
Empirical therapy	217 (72.3)	151 (69.6)	66 (30.4)		
Culture-guided therapy	83 (27.7)	71 (85.5)	12 (14.5)		

Chi-square test was used. Culture-guided therapy showed a statistically significant association with rational antimicrobial use. A p-value <0.05 was considered statistically significant.

WHO Prescribing Indicators

The average number of drugs per prescription was 4.8, and the average number of antimicrobials per prescription was 1.7. Antimicrobials were prescribed by generic name in 194 prescriptions (64.7%). A total of 244 prescriptions (81.3%) included antimicrobials from the National List of Essential Medicines. Injectable antimicrobial use was observed in 62.0% of prescriptions. Fixed-dose antimicrobial combinations were used in 76 prescriptions (25.3%), mainly beta-lactam and beta-lactamase inhibitor combinations (Table 5).

Table 5: WHO prescribing indicators for antimicrobial use

Prescribing indicator	Observed value
Average number of drugs per prescription	4.8
Average number of antimicrobials per prescription	1.7
Prescriptions with one antimicrobial	175 (58.3%)
Prescriptions with two or more antimicrobials	125 (41.7%)
Antimicrobials prescribed by generic name	194 (64.7%)
Prescriptions with injectable antimicrobials	186 (62.0%)
Antimicrobials from National List of Essential Medicines	244 (81.3%)
Fixed-dose antimicrobial combinations	76 (25.3%)

Values are shown as mean or number with percentage. These are descriptive WHO prescribing indicators; therefore, chi-square testing was not applicable.

Overall Rationality of Antimicrobial Prescriptions

Out of 300 antimicrobial prescriptions, 222 (74.0%) were considered rational, while 78 (26.0%) showed one or more irrational prescribing components (Figure. The common reasons for irrational use included unnecessary broad-spectrum therapy, prolonged duration without clear indication, avoidable injectable use, antimicrobial duplication, and absence of culture testing in cases where microbiological confirmation was clinically feasible. Lack of de-escalation after clinical improvement or culture reports was also observed in a small number of cases.

DISCUSSION

The present study assessed the prescription pattern and rationality of antimicrobial use in a tertiary care hospital. Out of 300 antimicrobial prescriptions analysed, 74.0% were considered rational, while 26.0% showed one or more irrational prescribing components. This finding indicates that antimicrobial prescribing in the study setting was generally acceptable, but there remains considerable scope for improvement. Irrational use of antimicrobials is clinically important because even minor deviations in drug selection, dose, route, duration, or indication can contribute to treatment failure, adverse drug reactions, increased cost of care, and antimicrobial resistance [1,2].

In this study, the mean number of drugs per prescription was 4.8, and the mean number of antimicrobials per prescription was 1.7. This suggests a moderate level of polypharmacy, which is commonly seen in tertiary care hospitals where patients often present with multiple symptoms, comorbidities, or complicated infections. However, a higher number of drugs per prescription may increase the risk of drug interactions, medication errors, and poor adherence. The World Health Organization has emphasized the need for regular prescription audits to identify such prescribing trends and improve rational drug use [10,11].

Cephalosporins were the most frequently prescribed antimicrobial class, accounting for 38.7% of prescriptions. This was followed by penicillins with beta-lactamase inhibitors, fluoroquinolones, nitroimidazoles, and macrolides. Similar findings have been reported in several hospital-based studies, where cephalosporins remain widely used because of their broad spectrum, convenient dosing, and perceived safety profile [6,7]. However, frequent use of broad-spectrum agents such as third-generation cephalosporins requires careful monitoring, as excessive dependence on these drugs may promote extended-spectrum beta-lactamase-producing organisms and other resistant pathogens [3,8].

Injectable antimicrobials were used in 62.0% of prescriptions. Injectable therapy is often justified in seriously ill patients, postoperative cases, emergency admissions, and patients unable to tolerate oral medicines. Still, high injectable use may also indicate a tendency to prefer parenteral therapy even when oral treatment is adequate. In the present study, rationality was slightly higher among oral prescriptions compared with injectable prescriptions, although the difference was not statistically significant. Early intravenous-to-oral switch is an important antimicrobial stewardship strategy, especially after clinical improvement, as it reduces hospital stay, nursing burden, injection-related complications, and treatment cost [16,17].

A major observation in this study was that empirical antimicrobial therapy was used in 72.3% of prescriptions, while culture-guided therapy was documented in only 27.7%. Empirical treatment is often necessary in acute infections, particularly when delay in therapy may worsen outcomes. However, empirical treatment should be guided by local resistance patterns, standard treatment guidelines, and clinical severity. The significantly higher rationality observed among culture-guided prescriptions in this study highlights the value of microbiological confirmation. Culture and sensitivity testing helps clinicians select narrower and more appropriate agents, avoid unnecessary combinations, and de-escalate therapy whenever possible [18,19].

Generic prescribing was observed in 64.7% of prescriptions, while 81.3% of antimicrobials were from the National List of Essential Medicines. These findings are encouraging but still indicate room for improvement. Prescribing by generic name improves clarity, reduces treatment cost, and supports uniform procurement and dispensing practices. The use of essential medicines also reflects better alignment with national priorities and evidence-based prescribing. The WHO prescribing indicators are useful for monitoring these practices and comparing prescribing quality across healthcare settings [11,14,15].

Overall, 26.0% of prescriptions were classified as irrational. The common reasons included unnecessary broad-spectrum therapy, prolonged duration without clear indication, avoidable injectable use, antimicrobial duplication, lack of microbiological confirmation, and failure to review therapy after culture reports. These findings are consistent with the known challenges in antimicrobial prescribing, particularly in busy tertiary care hospitals where rapid clinical decisions are often made under pressure [6,9]. Similar concerns have been described in previous studies, where inappropriate antibiotic selection and prolonged prophylaxis were identified as common contributors to irrational antimicrobial use [7,18].

Antimicrobial stewardship has become an essential component of hospital practice. Stewardship does not mean restricting antimicrobials blindly; rather, it aims to ensure that every patient receives the most appropriate antimicrobial at the correct dose, route, and duration. Core stewardship activities such as prescription audit, feedback to prescribers, local antibiogram-based guidelines, culture-based therapy, dose optimization, de-escalation, and intravenous-to-oral conversion can improve prescribing quality [16,17]. In the present study, the higher rationality seen with culture-guided therapy supports the need to strengthen microbiology-based decision-making.

The findings of this study also emphasize the importance of regular training for clinicians, interns, residents, nurses, and pharmacists. Awareness regarding the WHO AWaRe classification may help prescribers reduce unnecessary use of Watch and Reserve group antibiotics [12,13]. Regular departmental audit meetings, feedback from pharmacology and microbiology teams, and hospital antibiotic policy implementation can help reduce irrational prescribing. Such measures are particularly relevant in India, where antimicrobial resistance remains a major public health concern and rational use at the institutional level can contribute to national containment efforts [4,5].

This study has a few limitations. It was conducted in a single tertiary care hospital, so the findings may not represent prescribing practices in other healthcare settings. The assessment was based on prescription records, and complete clinical reasoning behind each prescription may not have been available in all cases. Microbiological reports were not available for all patients, which may have affected the assessment of definitive therapy. Despite these limitations, the study provides useful local data on antimicrobial prescribing and identifies practical areas where stewardship interventions can be strengthened.

CONCLUSION

The study showed that cephalosporins were the most commonly prescribed antimicrobial class, followed by penicillins with beta-lactamase inhibitors and fluoroquinolones. Most prescriptions were empirical, and culture-guided therapy was documented in a smaller proportion of cases. Overall, 74.0% of prescriptions were rational, while 26.0% showed irrational prescribing practices such as unnecessary broad-spectrum use, prolonged duration, avoidable injectable therapy, and lack of microbiological confirmation. The findings highlight the need for regular prescription audits, wider use of culture and sensitivity testing, adherence to standard treatment guidelines, and strengthening of antimicrobial stewardship activities. Improving rational antimicrobial use at the hospital level can help reduce resistance, improve patient outcomes, and support safer clinical practice.

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Conflict of Interest

The authors declare that there are no conflicts of interest related to this study.

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