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A prospective observational study Evaluating antibiotic utilization and prescribing practices among hospitalized patients

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ABSTRACT

***BACKGROUND**: Antibiotics play a crucial role in the treatment of bacterial infections among patients, admitted to general medicine wards. Improper and excessive use of antibiotics may contribute to adverse drug reactions, longer hospital stays, increased treatment costs, and the development of antimicrobial resistance. The research was designed for the purpose of- prospectively evaluating the utilization of antibiotics in hospitalized patients and to analyze the prescribing pattern and appropriateness of antibiotic therapy in the general medicine unit of a tertiary healthcare center. The present prospective observational research was conducted over six months and involved 106 inpatients who were prescribed at least one antibiotic during hospitalization. Relevant information was obtained from patient medical records, prescription charts, laboratory investigations, and treatment profiles using a structured data collection format. Details including demographic characteristics, diagnosis, type of antibiotic prescribed, dose, route of administration, duration of treatment, use of combination therapy, culture sensitivity testing, and occurrence of adverse drug reactions were documented and assessed.*

***FINDINGS**: The findings showed that respiratory, urinary, gastrointestinal, and skin infections were the most frequent conditions requiring antibiotic therapy. Among the different classes, beta-lactams, cephalosporins, and fluoroquinolones were prescribed most frequently. Intravenous antibiotics were commonly administered during the early stage of therapy, and combination treatment was observed in many patients. Empirical antibiotic therapy was often initiated before culture sensitivity reports became available. Continuous monitoring of antibiotic use also helped in detecting irrational prescribing practices, prolonged therapy without indication, and possible drug interactions.*

***INTERPRETATIONS:** The study highlights the importance of prospective monitoring in encouraging rational antibiotic use, improving therapeutic outcomes, minimizing adverse effects, reducing healthcare expenditure, and controlling antimicrobial resistance. Effective antibiotic stewardship programs and strict adherence to standard treatment protocols are necessary to support the optimal and safe utilization of antibiotics among hospitalized patients.*

***Keywords:** Antibiotics, general medicine, antimicrobial resistance, health economics, penicillins, cephalosporins, macrolides, and fluoroquinolones.*

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INTRODUCTION

ANTIBIOTICS Antibiotics are chemical substances used to treat infections caused by bacteria. They may either kill bacteria (bactericidal) or inhibit their growth (bacteriostatic)[1,3,4,5]. Antibiotics are among the most important discoveries in modern medicine and are widely used in general medical practice for treating infections such as respiratory tract infections, urinary tract infections, gastrointestinal infections, and skin infections [1,3,4].

Antibiotics are regarded as one of the most remarkable medical advancements of the twentieth century due to their major contribution to the successful management of infectious diseases[3,4].Despite their therapeutic benefits, the extensive and inappropriate use of antibiotics has created serious global health concerns. Misuse, overprescribing, and unnecessary consumption of antibiotics have contributed to the emergence of antibiotic-resistant bacteria, making infections more difficult to treat. Antibiotic resistance has become a major public health challenge worldwide, reducing the effectiveness of existing therapies and increasing the risk of complications, prolonged hospital stays, and mortality.stra Although antibiotics continue to play an essential role in healthcare, careful and rational use is necessary to preserve their effectiveness for future generations [6,10,14].

Antibiotics are among the most frequently prescribed medications in hospitalized patients and play a vital role in the treatment and prevention of bacterial infections. However, inappropriate antibiotic use, including unnecessary prescribing, incorrect selection, inappropriate dosing, prolonged duration of therapy, and excessive use of broad-spectrum antibiotics, can contribute to antimicrobial resistance, adverse drug reactions, increased healthcare costs, and poor patient outcomes [6,7,10.]

The General Medicine department manages patients with a wide range of infectious and non-infectious conditions, making it important to evaluate antibiotic prescribing practices in this setting. Monitoring antibiotic utilization can help identify commonly prescribed antibiotics, frequently treated infections, prescribing patterns, and areas of inappropriate or irrational antibiotic use[12].

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METHODOLOGY

The study included a total of 106 hospitalized patients, comprising 64 males (60.38%) and 42 females (39.62%), with the majority of participants belonging to the 45–65 years age group. The study was conducted in the General Medicine Department of a tertiary care teaching hospital over a period of six months. Patients hospitalized in the General Medicine Department, aged 18 years or older irrespective of gender, and prescribed at least one antimicrobial agent during hospitalization were included in the study. Patients receiving treatment on an outpatient basis, pregnant and breastfeeding women, patients hospitalized for less than 24 hours, patients with incomplete or insufficient medical records, and patients admitted to the Intensive Care Unit or other specialized departments were excluded from the study. Antibiotic prescriptions were regularly monitored during ward rounds, and antimicrobial therapy was assessed based on the patient's diagnosis, clinical condition, and laboratory findings. The appropriateness of antibiotic therapy was evaluated with respect to drug selection, dosage, route of administration, frequency, and duration of therapy. Data were collected prospectively during daily ward rounds from patient case records, medication charts, laboratory reports, and treatment files using a structured data collection form. Antibiotic therapy was monitored throughout the hospitalization period, and its appropriateness was assessed based on the selection of suitable antibiotics, correct dosage regimen, frequency and route of administration, duration of therapy, potential drug interactions, and adherence to standard treatment guidelines. The study evaluated the pattern of antimicrobial prescribing, most frequently prescribed antibiotics, use of combination antibiotic therapy, incidence of antibiotic-related adverse drug reactions, average duration of hospitalization, and appropriateness of antibiotic therapy. The collected data were recorded and organized using Microsoft Excel and analyzed using descriptive statistical techniques. The findings were expressed as frequencies, percentages, means, and standard deviations, wherever applicable, and presented using appropriate tables and graphical representations for clear interpretation. Prior approval was obtained from the Institutional Ethics Committee and the concerned hospital authorities before commencement of the study. Patient confidentiality and privacy were maintained throughout the study, and all collected information was used exclusively for academic and research purposes. The appropriateness of antibiotic prescribing was evaluated based on unnecessary use of broad-spectrum antibiotics, inappropriate combination antibiotic therapy, incorrect antibiotic dose or frequency, excessive or inappropriate duration of therapy, and lack of culture-guided antibiotic therapy where clinically indicated.

RESULT

Demographic Distribution (N=106)

The study included 106 hospitalized patients admitted to the Department of General Medicine were enrolled in the study. Among them, 64 patients were male while 42 patients were female.

Table 1: Gender-wise Distribution of Patients

S.NO	GENDER	NO OF PATIENTS	PERCENTAGE%
1	MALE	64	60.38%
2	FEMALE	42	39.62%
	TOTAL	106	100%

The gender-wise distribution of patients showed that male patients constituted the majority of the study population, accounting for 60.38% (n = 64) of the total participants, while female patients represented that males were more frequently admitted or included in the study than females.

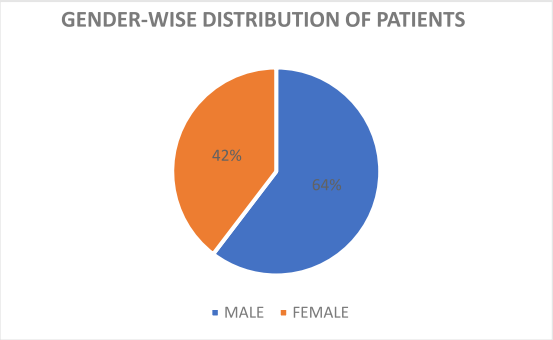

Figure 1. The pie chart illustrates the gender-wise distribution of the study population

PERCENTAGE ANALYSIS

The percentage for each category was determined by dividing the number of patients in that category by the total number of patients study population (n = 106). Percentage analysis was used to compare the distribution of different variables.

Parameter Formula Used:
Percentage (%) = (Frequency ÷Total sample size) × 100
Total sample =106 patients

Most Commonly Prescribed Antibiotics Among Male and Female Patients

The pattern of antibiotic prescribing was evaluated separately among Male and female patients hospitalized in the Department of General Medicine. Cephalosporins were identified as the most commonly Category of antibiotics prescribed in both groups, subsequently followed b penicillins and fluoroquinolones.

Table 2: Distribution of Commonly Prescribed Antibiotics According to Gender

S.NO	Antibiotic Class	Male Patients (n = 64)	Female Patients (n = 42)	Total Patients
1	Cephalosporins	24	16	40
2	Penicillins	15	10	25
3	Fluoroquinolones	10	5	15
4	Macrolides	9	6	15
5	Aminoglycosides	6	5	11
	TOTAL	64	42	106

The findings revealed that Cephalosporins were the most frequently prescribed Class of antibiotics among both Male as well as female patients, with a total utilization of 40 patients, Followed in frequency by penicillins 25 patients and fluoroquinolones 15 patients. The higher use of cephalosporins may be attributed to their Broad antimicrobial spectrum and frequent use in respiratory tract, urinary tract, and gastrointestinal infections.

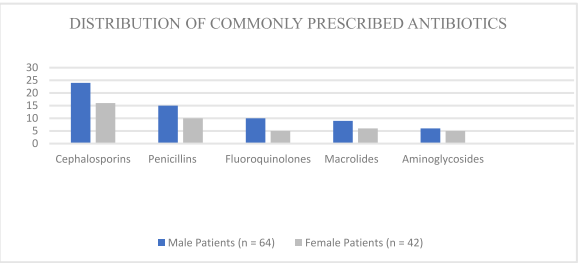

Figure 2. The bar diagram of Gender-wise Distribution of Commonly Prescribed Antibiotic

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Indications for Antibiotic Use

The indications for antibiotic therapy were assessed among hospitalized patients admitted to the General Medicine department. Antibiotics were primarily prescribed for the management of clinically suspected or laboratory-confirmed bacterial infections. Among the various conditions observed, respiratory tract infections were the leading indication for antimicrobial therapy, Subsequently followed by urinary tract and gastrointestinal infections.

Table 3: Distribution of clinical Indications for Antibiotic Therapy

S.NO	Indication	Number of Patients	Percentage (%)
1	Respiratory Tract Infections	32	30.19%
2	Urinary Tract Infections	21	19.81%
3	Gastrointestinal Infections	16	15.09%
4	Skin and Soft Tissue Infections	14	13.21%
5	Febrile Illness	12	11.32%
6	Diabetic Foot Infections	6	5.66%
7	Sepsis	5	4.72%
	TOTAL	106	100%

The results demonstrated that respiratory tract infections were the leading indication for antibiotic therapy, accounting for 32 patients (30.19%), followed by urinary tract infections (19.81%) and gastrointestinal infections (15.09%). Antibiotic selection was based on clinical presentation, severity of illness, and available laboratory investigations.

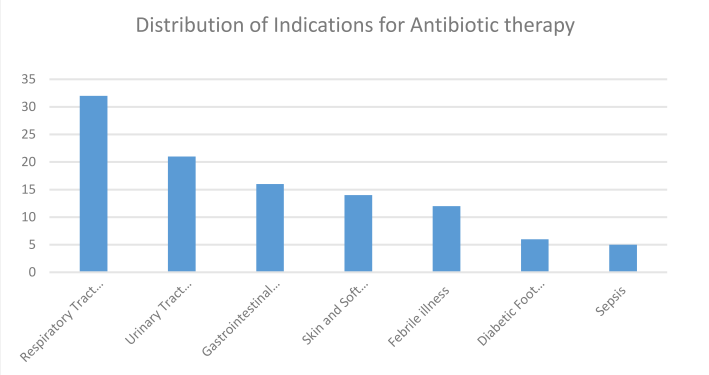

Figure 3. The bar diagram of distribution of Indications for Antibiotic Therapy

Monotherapy Prescribed Among Hospitalized Patients

Monotherapy refers to the administration of a single antibiotic for the treatment of an infection. In the present study, monotherapy was mainly prescribed for patients with mild to moderate infections where a single antimicrobial agent was considered adequate based on the patient's diagnosis and clinical status.

Table 4: Distribution of Monotherapy with Prescribed Antibiotics

S.NO	Antibiotic Prescribed	Indication	Number of Patients
1	Ceftriaxone	Respiratory Tract Infections	11
2	Amoxicillin + Clavulanic Acid	Urinary Tract Infections	8
3	Azithromycin	Upper respiratory tract infection (URTI)	6
4	Ciprofloxacin	GTI	5
5	Metronidazole	GTI	4
6	Cefixime	Urinary Tract Infections	4
7	Levofloxacin	Lower Respiratory Tract Infections	4
8	Piperacillin + Tazobactam	Sepsis	2
9	Doxycycline	Febrile Illness	2
10	Meropenem	Severe Bacterial Infections	3
	TOTAL		49

The study results showed that ceftriaxone was the most commonly prescribed antibiotic under monotherapy, mainly due to its broad-spectrum antimicrobial activity and effectiveness in treating respiratory tract infections. Monotherapy was predominantly used in patients with mild to moderate infections and stable clinical conditions.

Combination Therapy Prescribed Among Hospitalized Patients

Combination therapy refers to the simultaneous administration of two or more antibiotics for the management of infections. In the present study, combination antimicrobial therapy was frequently prescribed for severe infections, polymicrobial infections, and conditions requiring extended antimicrobial coverage.

Table 5: Distribution of Combination Therapy with Prescribed Antibiotics

S.NO	Combination of Antibiotics	Indication	Number of Patients
1	Ceftriaxone + Azithromycin	Respiratory Tract Infections	13
2	Piperacillin + Tazobactam + Metronidazole	Sepsis and Gastrointestinal Infections	9
3	Amoxicillin + Clavulanic Acid + Metronidazole	Gastrointestinal Infections	7
4	Cefoperazone + Sulbactam + Levofloxacin	Lower Respiratory Tract Infections	5
5	Ciprofloxacin + Metronidazole	Urinary and Gastrointestinal Infections	6
6	Meropenem + Linezolid	Severe Bacterial Infections	5
7	Ceftriaxone + Metronidazole	Diabetic Foot Infections	4
8	Piperacillin + Tazobactam + Amikacin	Sepsis	3
9	Cefixime + Azithromycin	Upper Respiratory Tract Infections	3
10	Levofloxacin + Doxycycline	Febrile Illness	2
	TOTAL	-	57

The results indicated that ceftriaxone + azithromycin was the most commonly prescribed combination therapy, used mainly for respiratory tract infections. Combination therapy was frequently utilized in severe infections, polymicrobial infections, and conditions requiring broader antimicrobial coverage.

Route of Administration of Antibiotics

The route of antibiotic administration was assessed among hospitalized patients to evaluate the pattern of antimicrobial delivery during the treatment period. Antibiotics were administered through intravenous, oral, and intramuscular routes depending on the severity of infection, patient condition, and therapeutic requirements.

Table 6: Distribution of Route of Administration of Antibiotics

S.NO	Route of Administration	Number of Patients	Percentage (%)
1	Intravenous (IV)	72	67.92%
2	Oral (PO)	27	25.47%
3	Intramuscular (IM)	7	6.60%
	TOTAL	106	100%

The findings showed that the intravenous route was the most frequently used method of antibiotic administration, accounting for 72 patients (67.92%), especially in severe infections and critically ill patients due to rapid therapeutic action.

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Duration of Antibiotic Therapy

The duration of antibiotic therapy was evaluated among hospitalized patients to determine the length of antimicrobial treatment administered during hospitalization. Duration of therapy was based on type and severity of infection, clinical response, and overall patient condition.

Table 7: Distribution of Duration of Antibiotic Therapy

S.NO	Duration of Therapy	Number of Patients	Percentage (%)
1	Less than 3 Days	19	17.92%
2	3–5 Days	36	33.96%
3	6–7 Days	28	26.42%
4	More than 7 Days	23	21.70%
	TOTAL	106	100%

The results demonstrated that most patients received antibiotic therapy for 3–5 days (33.96%). Longer treatment durations were mainly observed in patients with severe infections, sepsis, and complicated medical conditions requiring prolonged therapy.

Antibiotic prescribing using standard prescribing indicators and institutional guidelines

Table 8: Evaluation of Antibiotic Prescribing Using Standard Prescribing Indicators and Institutional Guidelines (N = 106)

S.NO	Prescribing Indicator	No. of Patients	Percentage (%)
1	Patients prescribed with antibiotics	106	100%
2	Antibiotics prescribed according to institutional guidelines	82	77.36%
3	Antibiotics prescribed not according to institutional guidelines	24	22.64%
4	Antibiotics prescribed by generic name	83	78.30%
5	Antibiotics prescribed from Essential Drug List (EDL)	91	85.85%
6	Antibiotic therapy with correct dose and frequency	88	83.82%
7	Antibiotic therapy with appropriate duration	86	81.13%
	TOTAL	106	100%

The antibiotic prescribing pattern was assessed using standard prescribing indicators and institutional guidelines. All 106 patients (100%) received antibiotic therapy during hospitalization. Among them, 82 prescriptions (77.36%) were in accordance with institutional guidelines, whereas 24 prescriptions (22.64%) showed deviation from recommended guidelines. Generic prescribing was observed in 78.30% prescriptions, 85.85% of antibiotics Were systematically chosen from the Essential Drug List (EDL). Appropriate dose, frequency, length of antibiotic treatment were observed in the majority of patients, indicating a relatively rational prescribing pattern.

Adverse Drug Reactions Associated with Antibiotic Therapy

Antibiotic therapy–associated adverse drug reactions were systematically monitored among hospitalized patients throughout the study period. Patients were regularly assessed for any undesirable or harmful effects following the use of antimicrobial. Identification of adverse drug reactions was based on Clinical findings presentation, laboratory investigations, and review of medication history.

Table 9: Distribution of Adverse Drug Reaction

S.NO	Adverse Drug Reaction	Number of Patients	Percentage (%)
1	Nausea and Vomiting	11	10.38%
2	Diarrhea	9	8.49%
3	Skin Rash and Allergic Reactions	6	5.66%
4	Gastric Irritation	5	4.72%
5	Headache	4	3.77%
6	Dizziness	3	2.83%
7	No Adverse Drug Reactions	68	64.15%
	TOTAL	106	100%

Majority of patients (64.15%) did not experience any adverse drug reactions during antibiotic therapy.

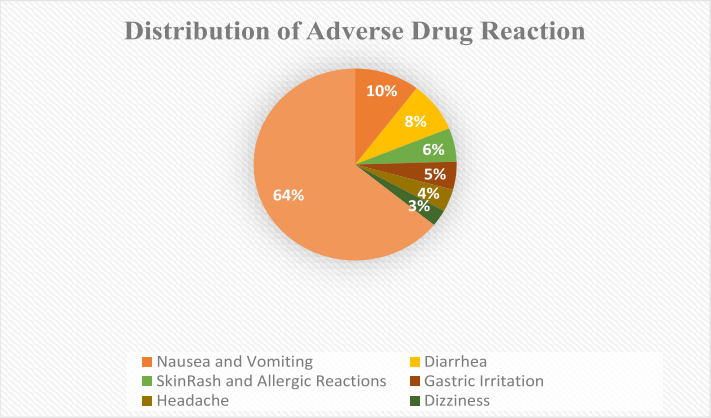

Figure 4. The pie chart of distribution of adverse drug reaction

Drug–Drug Interactions Associated with Antibiotic Therapy

Potential drug–drug interactions associated with antibiotic therapy were evaluated among hospitalized patients during the study period. The interactions were assessed based on the prescribed medications, patient clinical status, and the possible impact on treatment safety and therapeutic effectiveness. Continuous monitoring was performed to identify and prevent clinically significant interactions during antimicrobial therapy.

Table 10: Distribution of Drug–Drug Interactions

S.NO	Drug–Drug Interaction	Number of Patients	Percentage (%)
1	Ceftriaxone + Calcium-containing Drugs	13	12.26%
2	Ciprofloxacin + Antacids	11	10.38%
3	Metronidazole + Alcohol-containing Medications	8	7.55%
4	Azithromycin + QT-Prolonging Drugs	6	5.66%
5	Levofloxacin + Corticosteroids	5	4.72%
6	Aminoglycosides + Loop Diuretics	4	3.77%
7	No Significant Drug Interactions	59	55.66%
	TOTAL	106	100%

The study demonstrated that ceftriaxone with calcium-containing medications was the most frequently observed drug–drug interaction. Most identified interactions were monitored and managed appropriately to ensure safe and effective antibiotic use.

Antibiotic Prescribing Pattern

The antibiotic prescribing pattern among hospitalized patients was analyzed to evaluate the utilization of antimicrobial agents in the General Medicine department. The assessment included the class of antibiotics prescribed, frequency of use, empirical and culture-guided therapy, and adherence to standard treatment protocols.

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Table 11: Distribution of Antibiotic Prescribing Pattern

S.NO	Antibiotic Class	Number of Prescriptions	Percentage (%)
1	Cephalosporins	40	37.73%
2	Penicillins	25	23.58%
3	Fluoroquinolones	15	14.15%
4	Macrolides	11	10.38%
5	Aminoglycosides	9	8.49%
6	Carbapenems	6	4.72%
	TOTAL	106	100%

The results revealed that cephalosporins were the most commonly prescribed class of antibiotics (37.73%), followed by penicillins and fluoroquinolones. The prescribing pattern demonstrated frequent use of broad-spectrum antibiotics among hospitalized patients.

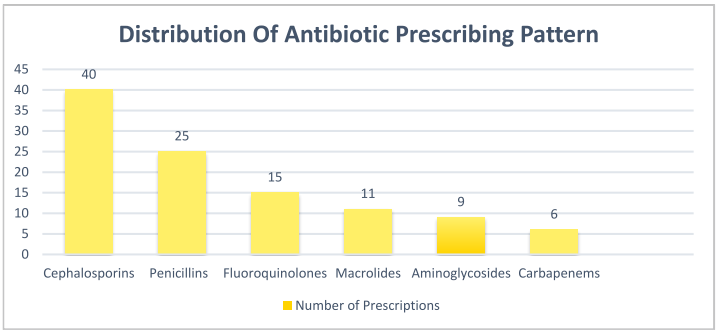

Figure 5. The bar diagram of Distribution of Antibiotic Prescribing Pattern

Assessment of Rational Antibiotic Use

The appropriateness of antibiotic use among hospitalized patients was evaluated to determine whether antimicrobial therapy was prescribed according to standard treatment guidelines, patient clinical condition, and laboratory investigation findings. The assessment included evaluation of antibiotic selection, dosage, frequency, route of administration, duration of therapy, and consideration of culture and sensitivity reports whenever available.

Table 12: Distribution of Rational Antibiotic Use

S.NO	Assessment Parameter	Number of Patients	Percentage (%)
1	Rational Antibiotic Use	83	78.30%
2	Irrational Antibiotic Use	23	21.70%
	Total	106	100%

The study results demonstrated that the majority of hospitalized patients received rational antibiotic therapy (78.30%) based on clinical indications and treatment guidelines. A smaller proportion showed inappropriate antibiotic use.

DISCUSSION

The present prospective observational study was undertaken to evaluate antibiotic utilization patterns and assess the appropriateness of antimicrobial therapy among hospitalized patients in the General Medicine Department. A total of 106 patients receiving antibiotic therapy were included in the study, and the findings provided valuable information regarding demographic characteristics, clinical indications, prescribing trends, antibiotic utilization patterns, route and duration of therapy, adverse drug reactions, drug–drug interactions, rational prescribing practices, adherence to institutional guidelines, and the role of antimicrobial stewardship in optimizing antibiotic use[11]. The demographic analysis revealed that male patients constituted 60.38% (n=64) of the study population, whereas female patients accounted for 39.62% (n=42), indicating a higher proportion of male patients receiving antibiotic therapy during the study period. This male predominance may be associated with differences in disease prevalence, healthcare-seeking behavior, risk-factor exposure, comorbid conditions, or hospitalization patterns, and similar male predominance has been reported in several hospital-based antimicrobial utilization studies. Respiratory tract infections were the predominant indication for antibiotic therapy, followed by urinary tract infections and gastrointestinal infections[2]. The higher frequency of respiratory infections may be related to their substantial burden among hospitalized patients and the frequent requirement for empirical antimicrobial therapy in patients presenting with clinical features suggestive of bacterial infection. However, not all respiratory infections are bacterial in origin, emphasizing the importance of appropriate clinical assessment, microbiological investigations where indicated, and reassessment of empirical therapy to prevent unnecessary antibiotic exposure. Evaluation of antibiotic prescribing patterns demonstrated that cephalosporins were the most frequently prescribed antibiotic class, accounting for 37.73% of prescriptions, followed by penicillins (23.58%) and fluoroquinolones (14.15%), with ceftriaxone being the most frequently prescribed individual antibiotic[19,22,23]. The predominant use of cephalosporins may be attributed to their broad-spectrum antibacterial activity, favorable pharmacokinetic properties, convenient dosing schedules, and effectiveness against commonly encountered infections among hospitalized patients[12]. However, excessive or inappropriate use of broad-spectrum antibiotics may increase the risk of antimicrobial resistance, adverse effects, and unnecessary healthcare expenditure; therefore, their use should be guided by clinical indications, microbiological findings, local resistance patterns, and institutional treatment guidelines[10]. The assessment of antibiotic therapy patterns showed that combination therapy was prescribed in 57 patients (53.77%), whereas monotherapy was prescribed in 49 patients (46.23%). Combination therapy may be justified in severe infections, suspected polymicrobial infections, or situations requiring broader empirical coverage; however, unnecessary combinations may increase the risk of adverse drug reactions, drug–drug interactions, treatment costs, and antimicrobial resistance[7]. Therefore, antibiotic combinations should be regularly reviewed and de-escalated whenever clinically appropriate[8]. Regarding the route of administration, intravenous antibiotics were the most commonly used route, accounting for 67.92% (n=72) of patients, followed by oral administration (25.47%) and intramuscular administration (6.60%). The higher utilization of intravenous therapy may be attributed to the need for rapid and reliable drug delivery in hospitalized patients with moderate-to-severe infections, whereas oral therapy was mainly used in clinically stable patients and those suitable for step-down treatment following clinical improvement. Appropriate conversion from intravenous to oral therapy can reduce treatment costs, improve patient comfort, and minimize complications associated with prolonged intravenous access. Analysis of treatment duration showed that the majority of patients received antibiotic therapy for 3–5 days (33.96%), followed by 6–7 days (26.42%), while treatment exceeding 7 days was mainly observed among patients with severe infections, complicated conditions, or associated comorbidities. Appropriate duration of antimicrobial therapy is an essential component of rational prescribing because unnecessary prolongation may increase healthcare costs, adverse drug reactions, antimicrobial resistance, and disruption of normal microbial flora[20].

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Regular reassessment of antibiotic therapy is therefore necessary to determine whether treatment should be continued, modified, de-escalated, or discontinued[16]. Adverse drug reactions were monitored throughout the study period, and gastrointestinal-related reactions such as nausea, vomiting, and diarrhea were the most frequently observed adverse effects[24].A majority of patients (64.15%) did not experience any adverse drug reactions during antibiotic therapy, while the identified reactions were generally mild and managed appropriately through monitoring and supportive measures. Drug–drug interactions associated with antibiotic therapy were also evaluated, and potential interactions were identified and monitored to improve medication safety, particularly because hospitalized patients frequently receive multiple concomitant medications. Assessment of antibiotic appropriateness demonstrated that 83 patients (78.30%) received rational antibiotic therapy, whereas 23 patients (21.70%) had inappropriate antibiotic use. The inappropriate prescribing identified in the study was mainly associated with unnecessary broad-spectrum antibiotic use, prolonged therapy duration, inappropriate antibiotic combinations, and empirical treatment without sufficient microbiological evidence[17]. These findings highlight the need for regular prescription review, microbiological investigations where appropriate, antibiotic deescalation, and adherence to evidence-based treatment recommendations. Evaluation of antibiotic prescribing using standard prescribing indicators and institutional guidelines demonstrated that 77.36% of prescriptions were in accordance with institutional guidelines, generic prescribing was observed in 78.30% of prescriptions, and 85.85% of antibiotics were selected from the Essential Drug List. These findings indicate a generally satisfactory level of adherence to rational prescribing principles; however, the remaining gaps demonstrate the need for continuous prescriber education, periodic prescription audits, implementation of updated treatment guidelines, and active involvement of clinical pharmacists in antimicrobial monitoring[9,15,25]. The findings also emphasize the importance of antimicrobial stewardship programs in promoting appropriate antibiotic selection, optimizing dose and duration, encouraging intravenous-to-oral conversion, reducing unnecessary broad-spectrum antibiotic exposure, and supporting de-escalation based on clinical and microbiological findings[13].Prospective monitoring combined with audit and feedback can help identify inappropriate prescribing practices at an early stage and promote evidence-based antimicrobial therapy.

CONCLUSION

The present research study entitled Prospective Monitoring of Antibiotic Use in Hospitalized Patients of the General Medicine Department was conducted with the aim of assessing antimicrobial utilization patterns, evaluating the rationality of antibiotic therapy, identifying inappropriate prescribing practices, and promoting the judicious use of antimicrobial agents among hospitalized patients[18]. This prospective observational study was conducted- in the General Medicine Department of a tertiary care teaching hospital and included 106 hospitalized patients who received one or more antibiotics during their hospital stay. Relevant patient information was collected prospectively from case records, prescription charts, laboratory investigation reports, and treatment documents using a structured data collection form.

The collected data were analyzed to assess demographic characteristics, clinical indications for antibiotic therapy, prescribing trends, antibiotic selection patterns, routes of administration, duration of treatment, rationality of prescriptions, and adherence to institutional antimicrobial guidelines. The demographic evaluation revealed that male patients constituted 60.38% (n=64) and female patients accounted for 39.62% (n=42) of the study population, indicating a higher proportion of male patients receiving antibiotic therapy during the study period. Among the various clinical conditions requiring antimicrobial treatment, respiratory tract infections were the most common indication (30.19%), followed by urinary tract infections (19.81%) and gastrointestinal infections (15.09%). Analysis of antibiotic utilization patterns demonstrated that cephalosporins were the most frequently prescribed antibiotic class (37.73%), followed by penicillins (23.58%) and fluoroquinolones (14.15%)[19]. Among individual antibiotics, ceftriaxone was the most commonly utilized agent, which may be attributed to its broad-spectrum antibacterial activity, clinical effectiveness, and extensive use in hospitalized patients. The study findings showed that combination antibiotic therapy was prescribed in 53.77% of patients, whereas 46.23% received monotherapy. Combination therapy was mainly used in patients with severe infections, suspected polymicrobial infections, or conditions requiring broader antimicrobial coverage. The intravenous route was the predominant method of antibiotic administration (67.92%), reflecting the need for rapid therapeutic response and effective drug delivery among hospitalized patients. Evaluation of antibiotic treatment duration revealed that the majority of patients received therapy for 3–5 days (33.96%), while prolonged treatment courses were mainly observed among patients with complicated infections, severe clinical conditions, or associated comorbidities. Safety monitoring revealed that gastrointestinal disturbances such as nausea, vomiting, and diarrhea were the commonly reported adverse drug reactions, with most events being mild and effectively managed. Potential drug–drug interactions related to antibiotic therapy were also identified and monitored to improve medication safety and therapeutic outcomes. The assessment of prescribing appropriateness revealed that 78.30% of patients received rational antibiotic therapy based on clinical indications, treatment guidelines, and available laboratory findings, whereas 21.70% of patients exhibited inappropriate antibiotic use. The major reasons for inappropriate prescribing included unnecessary broad-spectrum antibiotic use, inappropriate combination therapy, prolonged treatment duration, and empirical prescribing without sufficient microbiological evidence. Evaluation of antibiotic prescribing practices using standard prescribing indicators and institutional guidelines demonstrated that 77.36% of antibiotic prescriptions were in accordance with institutional recommendations. Furthermore, 78.30% of prescriptions were prescribed by generic names, and 85.85% of antibiotics were selected from the Essential Drug List, indicating satisfactory adherence to rational prescribing principles.These strategies support evidence-based prescribing, reduce unnecessary antimicrobial exposure, minimize medication-related complications, decrease healthcare expenditure, and help prevent the emergence of antimicrobial resistance. In conclusion, the present study highlights the importance of continuous surveillance of antibiotic prescribing practices and adherence to evidence-based antimicrobial guidelines in hospital settings.

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Strengthening antimicrobial stewardship programs, encouraging rational antibiotic selection, and regularly evaluating prescribing patterns can significantly contribute to optimizing antimicrobial therapy, improving patient outcomes, and ensuring the safe and effective use of antibiotics.

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