International Journal of Science and Research Methodology (IJSRM)
Volume 28, Issue 1, January 2025 ijsrm.humanjournals.com ISSN: 2454-2008

An Exhaustive Study on the Prescribing Pattern of Antibiotics in a Tertiary Care Hospital

***Dr. Areesha Siddiqui, Dr. Samiya Rais, Dr. Mohd Asim, Tarique Mahmood Ansari, Dr. Mukhtar Ahmad**

Department of pharmacy Integral University, Lucknow Uttar Pradesh Faculty of pharmacy Integral University, Lucknow Uttar Pradesh India.

Received: 2025-1-07 Revised: 2025-1-18 Accepted: 2025-1-25

ABSTRACT

Introduction: Antibiotics have a remarkable role in prolonging life, especially in underdeveloped and developing countries. Insufficient knowledge among doctors, peer pressure and patient demands, diagnostic uncertainties, and a lack of communication between the doctor, pharmacist, and patient all implicate inappropriate antibiotic prescribing practices. Irrational antibiotic prescriptions can lead to antibiotic resistance, marking a global crisis. Aim: To evaluate the drug utilisation pattern of different epitomes of antibiotics prescribed in the general medicine department of a tertiary care hospital. Materials and Methods: This prospective observational study was done in the tertiary care teaching hospital general medicine department, examining the prescribing record of antibiotic therapy for six months. Data was collected using a data collection checklist, which included patient identity, name, and route of the antibiotics prescribed, usage of different antibiotics, usage of prophylactic antibiotics, usage of generic names and rational use. The data was analyzed using Statistics (SPSS) version 16.0, and frequencies and percentages were determined for each variable. Results: The total 100 medical records were 57% men and 43% women, with patients aged 21–30 being more susceptible to infection, and 80.8% containing parenteral antibiotics. Ceftriaxone was found to be the most commonly prescribed antibiotic. 88.3% of prescriptions adhered to NLEM, 42% contained monotherapy, and 58% contained combination therapy of antibiotics. Overall, few prescriptions were irrational, and the use of multiple antibiotics with the same spectrum of coverage was found to be the most common reason for irrationality. Conclusion: In this study, the most prescribed antibiotics were from the NLEM. Cephalosporins were the most commonly used antibiotics for the patients in this hospital. Prescriptions with 51–60-year-olds having higher susceptibility These findings provide insights into prescribing patterns and treatment strategies.

Keywords: Antibiotics, Tertiary care Hospitals, Prescriptions, Gender diversity.

1. INTRODUCTION

The term "antibiotic" was coined by S.A. Waksman in 1942. These are natural drugs produced by several fungi or bacteria. These are different antibiotics from chemotherapeutic agents, which were mainly produced by synthesis. The differences were abolished after chemical synthesis, the realization of some antibiotics, and the development of new antibiotics from natural products with various side chains bound to the basic structure.[1],[2].In the year 1932, an antibiotic named "sulphonamides" became the first antibiotic to be prepared. Thereafter, the boom of antibiotics appeared, with about 5,000 substances developed between the years 1932 and 1945. At that time, sulphonamide became the drug of choice for treating diseases like UTI, new pneumococcal pneumonia, and even purulent meningitis. After the introduction of two more new antibiotics, penicillin, and streptomycin, their effects exceeded those of sulphonamides [3],[4].These two antibiotics covered a broad spectrum. Antibiotics are naturally produced substances from various microorganisms, such as bacteria or fungi. They work to inhibit the growth of other microorganisms and destroy their cell walls with the production of semisynthetic derivatives in the modern era. The term antibiotic has been renamed "antimicrobials," which refers to natural, semisynthetic, and synthetic substances that are capable of inhibiting the proliferation of microbes and thus leading to apoptosis [5],[6].Nowadays, antimicrobials are widely used agents not only as a drug for treating infections but also in agriculture, livestock farming, and fresh farming as growth enhancers or growth protective agents [7],[8]. It becomes important to know at this point that chemotherapeutic drugs that act against bacteria that have been produced from living organisms are called antibiotics, while those that are produced artificially in the laboratory are called antimicrobials. Antibiotics are commonly developed by soil microorganisms and are likely to be a means by which organisms regulate the growth of competing microorganisms in complex environments [9]. Antibiotics are also regarded as antimicrobial substances that are active against bacteria. They are the most salient type of antibacterial agent for fighting against bacterial infections, and antibiotic medications are universally used in the treatment and prevention of infections. They work by either killing or inhibiting the growth of bacteria [10].

1.1. Role of Antibiotics

Appropriate treatment of commonly occurring diseases and injuries and the provision of essential antibiotics are the two vital components of the primary health care concept, as per the Alma-Ata declaration of 1978. [11] Essential antibiotics are those antibiotics that satisfy the healthcare needs of the majority of the population; they should therefore be available at all times in adequate amounts and in appropriate dosages at a price the community can afford. These antibiotics are critically required for the management of 90% of commonly occurring medical conditions [12]. They must meet high standards of quality, safety, and efficacy at a low cost. Rational prescribing, therefore, involves the right decision by the prescriber [13]. This will eventually encourage the patient to take antibiotics and comply with the prescription served by the prescriber. The requirement for rational use of antibiotics is fulfilled if the process of prescribing is appropriately followed [14].

1.2. Uses of antibiotics

Antibiotics are effective in the treatment of infectious diseases due to their selective toxicity; that is, they have the main function of injuring or killing an invading microorganism without harming the cells of the host [15]. In most instances, the selective toxicity is relative rather than absolute, requiring that the concentration of the drug be carefully controlled to attack the microorganism while still being tolerated by the host. where antibiotics are considered generally safe and effective in fighting diseases [16].

The rationality of antibiotics is the most controversial and debated issue in today's clinical practice. Irrational antibiotic usage is a world problem, especially in developing countries, resulting in an increased emergence of resistance to most common bacteria, a higher cost of treatment, and prolonged hospitalization [17]. Promoting the rational use of medicines would help the human race fight disease and illness for a brighter tomorrow. Antibiotics can be important or even lifesaving in appropriate situations, but it is just as important to prevent the overuse of antibiotics, which can lead to resistance [18]. The rational use of drugs requires that the patient receive medications appropriate to their clinical needs in doses that meet their requirements for an adequate period at the least expensive price to them and their community. Irrational use of antibiotics should be checked for injudicious use, which can adversely affect the patient, cause the emergence of antibiotic resistance, and increase the cost [19]. The reasons for irrational use are varied, including the non-availability of medicines, self-medication, irrational prescribing by healthcare professionals, and a lack of drug information. WHO estimates that more than half of all antibiotics are prescribed, dispensed, or sold inappropriately and that half of all patients fail to take them correctly [20]. In 1981, the Action Programme on Essential Drugs was established to support countries in implementing national drug policies and working towards rational use of drugs [21]. The Delhi Society for Promotion of Rational Use of Drugs (DSPRUD) was established in India to encourage rational drug use. Antibiotic use evaluation is an ongoing, systematic process designed to maintain the appropriate and effective use of drugs and also to assess whether drug therapy is rational or not. WHO and the International Network for Rational Use of Drugs (INRUD) jointly published a standard methodology and prescription indicators for the evaluation of drug utilization in different health facilities [22]. WHO/INRUD developed drug use indicators (core drug use indicators) to measure the rational use of drugs in primary care. They are prescribing indicators, patient care indicators, and facility indicators. Antibiotics Smart Use [ASU], introduced in 2007, was an innovative model for us for promoting the rational use of antibiotics and counteracting antibiotic resistance. Our main objectives were to analyze the rational use of antibiotics using Micromedex and 1 MG and also to report the irrational use of antibiotics to the government.

2. Material and Methods

This was a prospective observational study done on the inpatients of the Integral Institute of Medical Sciences and Research (IIMS&R), a tertiary care teaching hospital in Lucknow, India, for six months. The study was carried out after the approval of the Institutional Review Board (IRB) and Institutional Ethics Committee (IEC) (Ref. No. IU/R&D/2024-MCN0002471&) The medical prescription file was collected from the general medicine ward of the integral hospital.

2.1. Inclusion Criteria

All medical prescription records available during the study period were taken for data collection. All the patients are included, irrespective of age and sex. Patients diagnosed with infection, pregnant, and lactating patients will also be included. Any condition in which antibiotics were indicated.

2.2. Exclusion Criteria

Medical records that were not legible due to poor handwriting were excluded. Mentally challenged and unconscious patient, patient continuing on only those antibiotics that were prescribed outside the hospital, patient is unable to comply, and substance abuse.

2.3. Study Procedure

Overall, 100 prescription medical files were audited, and data regarding antibiotic prescriptions was collected. Data was collected using a data collection checklist, which includes patient identity and marital status, name and route of the antibiotic prescribed, usage of multiple antibiotics, usage of fixed dose combinations (FDCs), and rational use. The data collected was kept strictly confidential and was used for this study only. The data regarding the drugs prescribed were analysed in accordance with the WHO recommended prescribing indicators and expressed as percentages, mean standard deviation, and p value:

2.4. Statistical Analysis

The data were entered in a Microsoft Excel sheet, and the entire data were analysed using SPSS version 16.0. Frequencies descriptive statistics, paired t tests, nova statistics, mean standard deviation, graphs, percentages, and tabular format were determined.

3. Results

Out of 100 medical records, 57 (57%) were males and 43 (43%) were females as shown in fig.1.

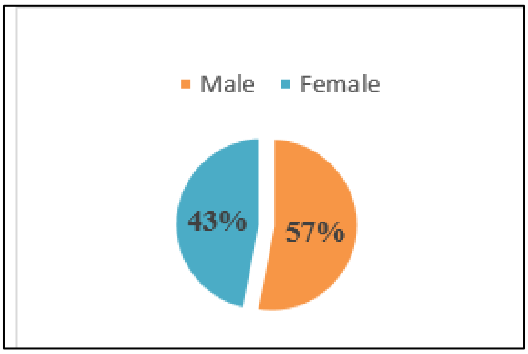

Figure 1. Gender Diversity of Patients

The mean age of the patients was 19.9 years. Young adults (21–30 years) were the most frequently prescribed age group, which accounted for 24 out of 100 record files, and elderly patients (above 40–50 years of age) were the least, which represented 10 (10%) as shown in table 1 and fig 2.

Table 1. Gender wise and Age Wise Distribution of Records

Patients' characteristics	Number (%)
Sex	
Male	57 (57%)
Female	43 (43%)
Age group (years)	
10-20.	14 (14%)
21-30.	24 (24%)
31-40	19 (19%)
41-50	10 (10%)
51-60	21 (21%)
61-80	12 (12%)

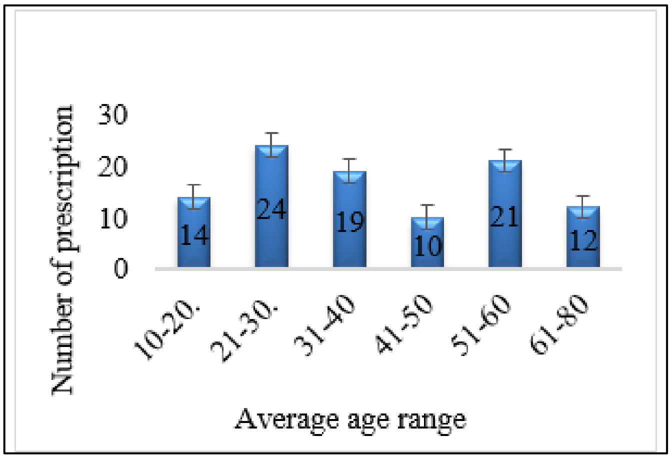

Figure 2. Frequency of Age limit With Prescription Percentage

The medical records audited general medicine departments, in which the majority of the records (42%) were with a single antibiotic.

Table 2. Frequency and Percentage of Therapy Regime

Antibiotics Used	Frequency %	Mean ± SD
Monotherapy	42 (42%)	0.49652 ± 0.5008
Polytherapy	58 (58%)	0.4995 ± 0.5023
Multiple Antibiotics N=58		
2 Antibiotics	33 (33%)	0.46811 ± 0.48625
More than 2 Antibiotics	25 (25%)	0.2709 ± 0.3699
Dosage Form of Antibiotics		
Oral	35 (19.2%)	0.4223 ± 0.4619
Parenteral	147 (80.7%)	0.2428 ± 0.3502
Antibiotics Prescribed by Name		
Brand Name	56 (56%)	0.49479 ± 0.4999
Generic Name	25 (25%)	0.3592 ± 0.4259
Both Generic and Brand	19 (19%)	0.2844 ± 0.3790

A total of 100 records (58%) consisted of multiple antibiotics; 33% were two antibiotics, and 25 (25%) were with three or more antibiotics as shown in Table 2 and fig 3,4.

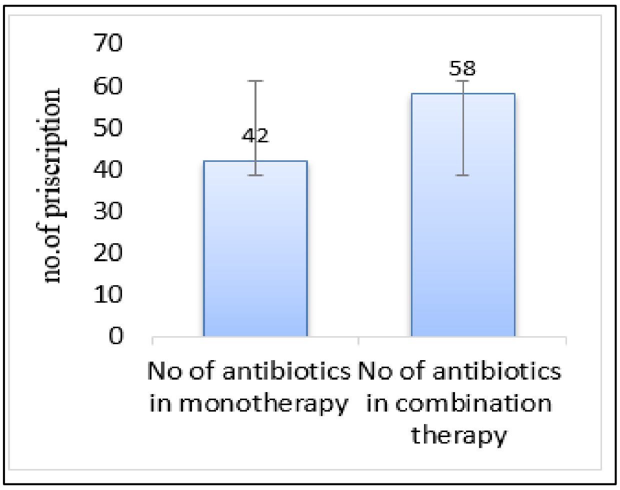

Figure 3. Monotherapy VS Polytherapy

International Journal of Science and Research Methodology (IJSRM)
Volume 28, Issue 1, January 2025 ijsrm.humanjournals.com ISSN: 2454-2008

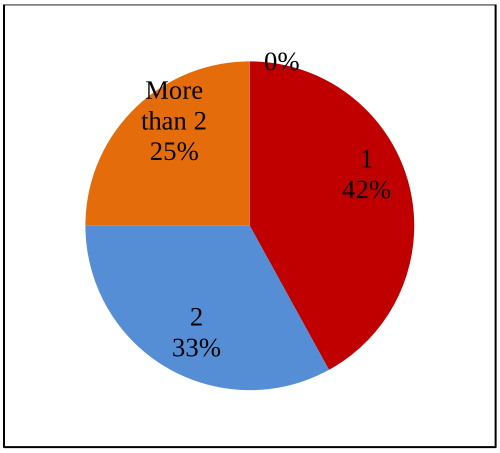

Figure 4. No. of Antibiotics Having Per Prescription

The total number of antibiotics prescribed was 182. Among these, 35 (19.2%) were oral, and 147 (80.7%) were parenteral, as shown in Fig. 5.

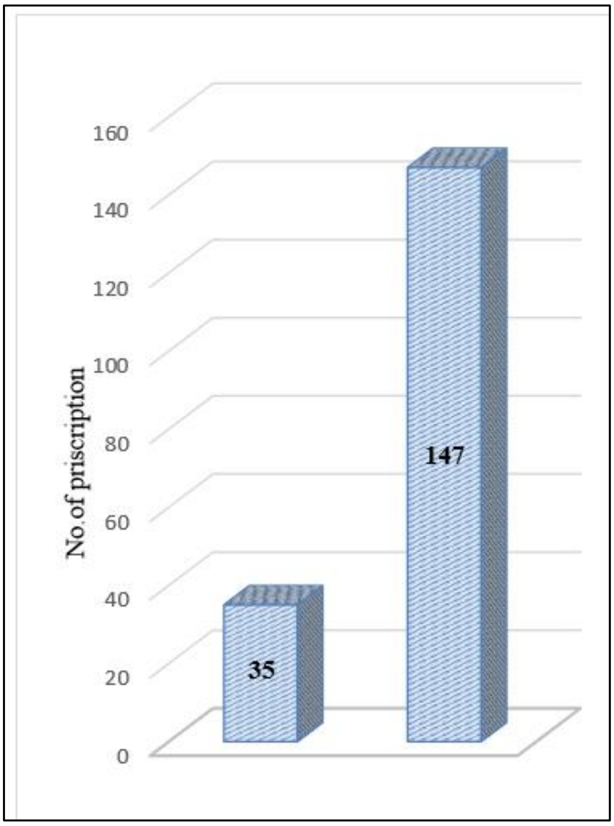

Figure 5. Oral VS Parentral Antibiotic

Generic names were prescribed in 25 records, which represented about 25%. There are a total of 100 records, 56 of which are brand-name antibiotics and 19 of which are both generic and brand-name, as shown in tables 2 and fig.6.

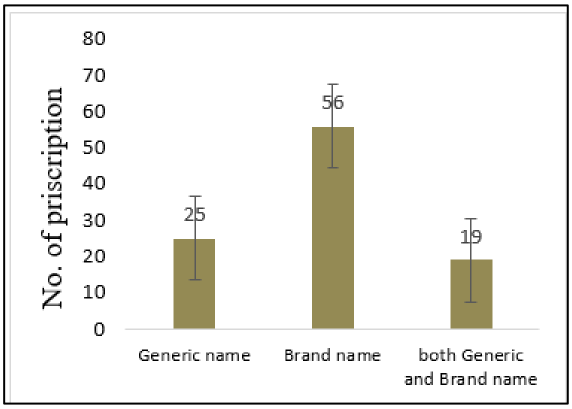

Figure 6. Generic VS Brand Name

There was a total of 182 antibiotics, and the most prescribed antibiotic group was cephalosporins (62), followed by beta-lactamase (41), and macrolide (35).

Table 3. Total Number of Antibiotics used in 100 Patient

Antibiotics class	Numbers %
Cephalosporins	62 (34%)
Oxazolidines	3 (1.6%)
Beta-lactamase	41 (22%)
Macrolide	35 (19%)
Tetracycline	7 (3.8%)
Lincomycin	2 (1.09%)
Nitroimidazole	10 (5.49%)
Aminoglycoside	5 (2.74%)
Nitrofurans derivatives	10 (5.49%)
Glycopeptide	1 (0.54%)
Fluoroquinolones	6 (3.29%)

In 100 medical records, 17 epitomes of antibiotics were prescribed, of which Ceftriaxone (62) was the most frequently prescribed, followed by beta-lactamase (41), macrolide (azithromycin, clarithromycin (35)), nitrofurantoin (10), and piperacillin tazobactam (10) as shown in table 4.

Table 4. Anatomical classification Frequency of Used Most of the 17 Prescribed Antibiotics

Name of drug	No. of drugs	ATC code
Ceftriaxone	62	J01DD04
Linezolid	3	J01XX08
Amoxycillin + Clavulanic acid	11	JO1CA04
Doxycycline	11	J01AA02
Piperacillin Tazobactam	10	J01CR05
Clindamycin	2	J01FF01
Amikacin	5	J01GB06
clarithromycin	4	J01FA09
Levofloxacin	3	J01MA12
nitrofurantoin	10	J01XE01
cefixime	4	J01DD08
Ofloxacin	2	S01AE01
Vancomycin	1	JO1XA01
clarithromycin	1	J01FA09
Cefotaxime	4	J01DD01
Ciprofloxacin	1	S01AE03
clarithromycin	4	J01FA09

The anatomical classification and frequency of use of most of the 17 prescribed antibiotics are indicated in Table 4. Which medication classes are most frequently used can be determined from the data.

Table 5. Analysis of WHO Prescribing Indicators

Parameter Obtained	Obtained value	Standard WHO value [16
The average number of antibiotics per encounter	1 antibiotic {0.49 (mean)}	<2
Percentage of antibiotic injections encountered	80.76%	<20%
percentage of antibiotics prescribed as generics	25%	100%

This study describes the antibiotic prescription rates according to World Health Organisation standards, providing values for these crucial health metrics. The results shed light on how local prescribing habits compare to recommended guidelines, offering insight into optimisation opportunities.

4. Discussion

In this study, 100 medical prescription file records were analysed. Among the medical records with antibiotics, 57% were male patients, and 43% were female patients. The gender distribution was similar to the studies conducted by Walter Kluwer (males: 38% and females: 62%). [24] The higher number of females can be accounted for by the larger number of medical prescription file records analysed by the Department of Obstetrics and Gynaecology. In the study, the antibiotic prescription record was higher in the age group 21–30 years (24%) and lower in the age group >50 years (10%). The inclusion of a higher number of males in the young adult reproductive age group can again be the reason for the higher antibiotic prescription rate in the age group of 21–30 years. Out of the 100 records with antibiotics, 58% consisted of multiple antibiotics. The use of FDCs (98 out of 225 (43.6%)) can explain this higher percentage of use of multiple antibiotics. This was similar to the studies conducted by Demoz GT (39%), Mani S., and HariharanTS (36%). [25],[26] This study found that 80.2% of antibiotics were parenteral and 19.2% were oral antibiotics. The percentage of parenteral antibiotics was similar to that in the study conducted by Remesh A (60%). [27] Some studies, Demoz GT (84.8%) and Amaha ND (81.4%), reported significantly higher parenteral antibiotic prescriptions than these [27],[31].These studies were conducted in referral hospitals [19] and comprehensive specialists reported significantly higher parenteral antibiotic prescriptions than these [25], [26]. These studies were conducted in a referral hospital and a comprehensive, specialised hospital [28]. A lower value was found in the study conducted by Mani S. and Hariharan TS[25]. This study was conducted in a tertiary care teaching hospital that primarily handles serious infections that are referred from lower centers. This can be the reason why the antibiotic prescription percentage in hospitals is on the higher side.

The fourth parameter was the percentage of injections encountered. The percentage obtained in this study was 75.82% higher than the standard WHO value, which was <20%. This can be justified because the study population in this study was inpatients. Most of the cases handled by this institution were serious infections that required parenteral dosage forms. The studies that were done on outpatients showed lower percentages [25]. The value obtained in this study (80.7%) was comparable to the value obtained in the study done by Remesh A, who also studied antibiotic prescribing patterns in inpatients [27]. Raj Shivaani MRand Selva P, who studied inpatients, had a lower value [29],and the most frequent reason for irrationality happened to be the use of multiple antibiotics with the same spectrum of coverage. In a study conducted in Bangladesh by Begum T, who analysed the rationality of antibiotic prescriptions in admitted patients, 14 were irrational, but the reasons for irrationality were not assessed [30]. 60% of the prescriptions were found incorrect in the study done by Hadi U, where irrationalities in surgical prophylaxis were the main culprit [31]. The findings of this study, which were on par with several previous studies, laid a foundation on which strong initiatives could be established for promoting rational use of antibiotics. These initiatives can effectively fight antibiotic resistance, which is an upcoming danger to the world population.

5. Limitation(s)

The present institution is an Integral Institute of Medical Sciences and Research (IIMS&R), and the prescription pattern depends on the government supply of drugs. In this study, all the clinical departments of Integral Hospital were not included, especially the super speciality departments.

6. Conclusions

The present study puts forward the trends in the prescription of antibiotics among the inpatients of this integral hospital, from which the rationality of antibiotic use in this hospital could be assessed. This six-month study revealed that cephalosporins were the most often prescribed antibiotics for the Integral Hospital's inpatients and that the majority of antibiotics were prescribed by NLEMs. The antibiotics that were prescribed most frequently were macrolides and amoxycillin, respectively. The use of generic names in the patient's medical prescription record was low. Awareness among the physicians must be boosted in this regard. Irrational prescriptions contributed a minor percentage, and reserve antibiotics were too few. This data can be used as a reference scale for measuring and comparing the impact of steps taken to promote rational use of antibiotics. It is recommended that the process of prescription auditing be enhanced to nullify the upcoming threat of antibiotic resistance. Similar studies must also be encouraged to improve physicians' prescribing.

REFERENCES

1. Asma A, Mohd I, Firoz A. Determination of multiple antibiotic resistance patterns and indexing among metal tolerant Î²-lactamase-producing Escherichia coli. african journal of microbiology research. 2014 ;8(7):619-627.
2. Waksman SA. The role of antibiotics in nature. Perspectives in biology and medicine. 1961;4(3):271-87.
3. Tandon C, George R, Bajpai P, Mathur P. Mechanistic Studies of Dinoxin B withanolide, A Herbal Antibiotic from Datura inoxia against Staphylococcus aureus. Research Journal of Pharmacy and Technology. 2023;16(10):4505-11.
4. Waksman SA, Woodruff HB. Selective antibiotic action of various substances of microbial origin. Journal of bacteriology. 1942 Sep;44(3):373-84.
5. Shaikh S, Fatima J, Shakil S, Rizvi SM, Kamal MA. Antibiotic resistance and extended spectrum beta-lactamases: Types, epidemiology and treatment. Saudi journal of biological sciences. 2015 Jan 1;22(1):90-101
6. Waksman SA. History of the word 'antibiotic'. Journal of the history of medicine and allied sciences. 1973 Jul 1;28(3):284-6.
7. NAQVI S, Ahmad M, Akhter M, Yadav A, Singh A, Ahmad J, SHAMS AR. Drug Utilization Pattern and Adverse Drug Reaction Monitoring of Antibiotics Use in Ear, Nose and Throat Infection at Tertiary Care Hospital, Lucknow, India. Authorea Preprints. 2023 Mar 19.
8. Woodruff HB. Selman A. Waksman, winner of the 1952 Nobel Prize for physiology or medicine. Applied and environmental microbiology. 2014 Jan 1;80(1):2-8.
9. Waksman SA. Successes and failures in the search for antibiotics. Advances in Applied Microbiology. 1970 Jan 1;11:1-6.
10. Comroe Jr JH. Pay dirt: the story of streptomycin: Part I. From Waksman to Waksman. American Review of Respiratory Disease. 1978 Apr;117(4):773-81.
11. Weiss D, Waksman SA. Strain Specificity and Production of Antibiotic Substances: IX. Bacteriostatic and Bactericidal Properties of Neomycin and Development of Resistant Strains. Proceedings of the National Academy of Sciences. 1950 May;36(5):293-300.
12. Bush K. The coming of age of antibiotics: discovery and therapeutic value. Annals of the New York Academy of Sciences. 2010 Dec;1213(1):1-4.
13. Waksman, S.A. & J.E. Flynn. 1973. History of the word 'an-tibiotic.'J.Hist.Med.AlliedSci.28:284–286
14. Davies J, Davies D. Origins and evolution of antibiotic resistance. Microbiology and molecular biology reviews. 2010 Sep;74(3):417-33.
15. Abhijit K, Jain P, Upadhyaya P, Jain S. Antibiotic prescribing in various clinical departments in a tertiary care teaching hospital in northern India. Journal of Clinical and Diagnostic Research: JCDR. 2014 May;8(5):HC09.
16. Sade K, Holtzer I, Levo Y, Kivity S. The economic burden of antibiotic treatment of penicillin-allergic patients in internal medicine wards of a general tertiary care hospital. Clinical & Experimental Allergy. 2003 Apr;33(4):501-6.
17. Aminov RI. The role of antibiotics and antibiotic resistance in nature. Environmental microbiology. 2009 Dec;11(12):2970-88.
18. Walsh F. The multiple roles of antibiotics and antibiotic resistance in nature. Frontiers in microbiology. 2013 Aug 27;4:255.
19. Siddique A, Hafeez AK, Shekhar HS, Ashfaque A. Evaluation of Rational use of Antibiotics in Medicine Ward of a Tertiary Care Hospital. Journal of Young Pharmacists. 2020;12(3):250.
20. Rajalingam B, Alex AS, Godwin A, Cherian C, Cyriac C. Assessment of rational use of antibiotics in a private tertiary care teaching hospital. IndianJournal of Pharmacy Practice. 2016;9(1).
21. Rajalingam B, Alex AS, Godwin A, Cherian C, Cyriac C. Assessment of rational use of antibiotics in a private tertiary care teaching hospital. Indian Journal of Pharmacy Practice. 2016;9(1).
22. Datta SK, Paul TR, Monwar MO, Khatun AM, Islam MR, Ali MA, BARMAN RK, RAHMAN BM, WAHED MI. Patterns of prescription and antibiotic use among outpatients in a tertiary care teaching hospital of Bangladesh. Int J Pharm Pharm Sci. 2016;8(11):54.
23. Sur RL, Krambeck AE, Large T, Bechis SK, Friedlander DF, Monga M, Hsi RS, Miller NL, Chew BH, Lange D, Knudsen B. A randomized controlled trial of preoperative prophylactic antibiotics for percutaneous nephrolithotomy in moderate to high infectious risk population: a report from the EDGE consortium. The Journal of urology. 2021 May;205(5):1379-86.
24. Demoz GT, Kasahun GG, Hagazy K, Woldu G, Wahdey S, Tadesse DB, Niriayo YL. Prescribing pattern of antibiotics using WHO prescribing indicators among inpatients in Ethiopia: a need for antibiotic stewardship program. Infection and Drug Resistance. 2020 Aug 11:2783-94.
25. Mani S, Hariharan TS. A prospective study on the pattern of antibiotic use in a tertiary care hospital. Int J Basic Clin Pharmacol. 2017;6:2237-43.
26. Remesh A, Salim S, Gayathri AM, Nair U, Retnavally KG. Antibiotics prescribing pattern in the in-patient departments of a tertiary care hospital. Arch Pharm Pract. 2013 Apr 1;4(2):71.

How to cite this article:
Dr. Areesha Siddiqui et al. Ijsrm.Human, 2025; Vol. 28 (1): 33-41.

Conflict of Interest Statement: All authors have nothing else to disclose.

	**Author Name (Dr. Areesha Siddiqui) – Corresponding Author (Tariq Mahmood Ansari)** **Department of pharmacy** **Integral University, Lucknow Uttar Pradesh Faculty of pharmacy Integral University, Lucknow Uttar Pradesh India.**
	**Author Name - Dr.Samiya Rais** **Department of pharmacy** **Integral University, Lucknow Uttar Pradesh Faculty of pharmacy Integral University, Lucknow Uttar Pradesh India**
	**Author Name - Dr. Mohd Asim** **Department of pharmacy** **Integral University, Lucknow Uttar Pradesh Faculty of pharmacy Integral University, Lucknow Uttar Pradesh India**
Image Author -4	**Author Name - Tariq Mahmood Ansari** **Department of pharmacy** **Integral University, Lucknow Uttar Pradesh Faculty of pharmacy Integral University, Lucknow Uttar Pradesh India**
Image Author -5	**Author Name - Dr. Mukhtar Ahmad** **Integral Institue Of Medical Sciences & Research Hospital** **Integral University, Lucknow Uttar Pradesh**