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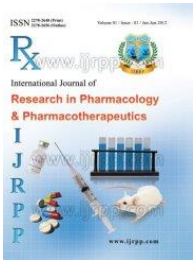

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Observational study on prescription pattern of various antibiotics in a teaching hospital

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ABSTRACT

Introduction

Prescription pattern monitoring studies (PPMS) are useful to assess the prescribing, dispensing and distribution of medicines. They promote appropriate use of monitored drugs, reduce the misuse of these valuable resources and also help in preventing future drug resistance.

Aim of the study

To study prescription pattern of various antibiotics in a teaching hospital

Materials and Methods

An observational study was done for a period of one year from April 2017 to March 2018 in the department of Pharmacology at Mallareddy Narayana Multispecialty Hospital, Suraram, Hyderabad, Telangana. Drug related information like number of drugs prescribed, dose, route of administration, frequency, indication, therapy duration, month of admission, the total number of drugs prescribed, total number of antibiotics prescribed were studied.

Results

In the present study majority of patients, 43.3% (130/300) were among 31-40 years, followed by 16.6% (50/300) patients among 41-50 years. Male predominance (66.6%) compared to females (33.3%) was seen. On clinical diagnosis, Respiratory tract infections were the most common in 50% (150/300) cases and antibiotics were prescribed in high percentage (21.5%), followed by viral fever (16.6%). 195(65%) prescriptions had antibiotic monotherapy, 72 (24%) prescriptions had two antibiotic drugs, 33 (11 %) prescriptions had more than 2 antibiotic drugs. Cephalosporins were commonly prescribed in 173 (49.4%) cases.

Conclusion

Various clinical conditions across all age groups require use of antibiotics. Respiratory tract infections are the most common indications for prescribing antibiotics. Cephalosporins and quinolones are the most commonly prescribed antibiotics. Antibiotic monotherapy is commoner than usage of multiple antibiotics. Rational use of appropriate antibiotics can obviate drug resistance in future and continuous monitoring of antibiotic usage in hospitals is recommended.

Keywords: Prescription pattern, Antibiotics, Drugs, Monitoring antibiotics

INTRODUCTION

Prescription pattern monitoring studies (PPMS) are a tool for assessing the prescribing, dispensing and distribution of medicines. Prescription pattern monitoring studies (PPMS) are drug utilization studies with the main focus on prescribing, dispensing and administering of drugs. They promote appropriate use of monitored drugs and reduce the abuse or misuse of monitored drugs. [1]

Rational drug prescribing is the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost. [2]

Irrational prescribing and disparity between the prescription and the consumption of medicines may offset the benefits which are demonstrated by randomized controlled trials on drug efficacy. [3-6] The prevalence of antibiotic use is very high in India and ranges from 24 to 67% [7]

Several measures can be taken to prevent untoward outcomes associated with antibiotic resistance such as monitoring patient dosages and formulations, assessing patients' pharmacokinetic profile on a timely basis and monitoring and treating patients for adverse drug reactions (ADR). [8, 9]

Patients admitted into the intensive care units (ICUs) are often prescribed multiple broad spectrum antibiotics at admission as they are severely sick, exposed to multiple invasive procedures and also are vulnerable to multidrug-resistant pathogens. However, these prescriptions are often empiric and based on physician comfort and prior experience, often leading to overuse or misuse of antibiotics. Such practices lead to antibiotic resistance, increase the risk of undesirable side effects in already compromised patients and also increase the overall treatment costs. [10-12]

AIM OF THE STUDY

To study prescription pattern of various antibiotics in a teaching hospital

MATERIALS AND METHODS

No ethical issues were involved in the study. Informed consent was taken from all the patients who were included in the study.

This was a prospective observational study done in the department of Pharmacology over a period of one year from April 2017 to March 2018 at Mallareddy Narayana Multispecialty Hospital, Suraram, Hyderabad.

Data was collected from medical record section including date and month of admission, age, gender, history of chief complaints, clinical diagnosis and complete medical history.

Drug related information like number of drugs prescribed, dose, route of administration, frequency, indication, duration of treatment, the total number of drugs prescribed, total number of antibiotics prescribed.

Rationality of antibiotics: The drug utilization was assessed by the World health organization (WHO) core drug indicators such as prescribing indicator**s.** [13]

The total number of drugs prescribed, total number of antibiotics prescribed, number of antibiotics used as Monotherapy and in combination, and drugs prescribed by generic/ branded names. The adherences of antibiotics prescription were checked with the WHO essential drug list (EDL). [14]

A total of 300 patients were included in our study who were prescribed drugs and were on antibiotic treatment or prophylaxis.

The 300 cases were from admitted in-patients from various departments like the department of General Medicine, General Surgery, ICU, Pediatrics, and Orthopedics.

Inclusion criteria

1. Age from 15 years to 80 years
2. Both the genders
3. Patients admitted in the department of General Medicine, General Surgery, ICU, Pediatrics, and Orthopedics who were prescribed antibiotics for various infections.

Exclusion criteria

1. Age below 15 years
2. Patients admitted in the department of Obstetrics and Gynaecology and Dermatology

RESULTS

A total of 300 patients were studied.

Table 1 Age distribution in years

Age in years	No. of cases	Percent (%)
15-30 years	30	10%
31-40 years	130	43.3%
41-50 years	50	16.6%
51-60 years	30	10%
61-70 years	35	11.6%
71-80 years	25	8.3%
Total	300	100%

In the present study, majority of patients 43.3% (130/300) were among 31-40 years followed by 16.6% (50/300) patients among 41-50 years.

Gender-wise distribution

In the present study, there were 200 (66.6%) male patients and 100 (33.3%) female patients. The male to female ratio was 2:1.

Table 2 Indications for prescribing the antibiotics

Indications	No. of cases	Percent (%)
Respiratory tract infection	150	50%
Viral Infection	50	16.6%
Urinary Tract Infection	30	10%
Acute gastroenteritis	20	6.6%
Pyrexia of unknown origin	20	6.6%
Appendicitis	10	3.3%
Meningitis	05	1.6%
Osteomyelitis	10	3.3%
Anemia with infection	05	1.6%
Total	300	100%

In the present study, Respiratory tract infections were the most common indication for prescribing antibiotics and were seen in 50% (150/300) cases followed by viral fever (16.6%),

Table 3 Prescription patterns

Pattern of prescription	No. of cases	Percent (%)
Monotherapy	195	65%
Two drugs	72	24%
More than two drugs	33	11%
Total	300	100%

In the present study, many 195(65%) cases received only Monotherapy.

Table 4 Distribution of antibiotics

Antibiotics	No. of antibiotics	Percent (%)
Cephalosporins	205	58.5%
Pencillins	4	1.1%
Aminoglycosides	35	10%
Quinolones	40	11.4%
Nitroimidazoles	35	10%
Tetracyclines	3	0.8%
Beta lactamase inhibitors	28	8%
Total	350*	100%

*Some of the patients received more than one antibiotic.

Cephalosporins were the most commonly used antibiotics and were seen in 58.5% cases. Penicillins and tetracyclines were least prescribed.

Route of administration

Out of 350 antibiotics prescribed in the study, 290 (82.8%) were given by parenteral administration and 60 (17.1 %) received oral administration.

DISCUSSION

In the present study 300 patients were prescribed antibiotics for treatment purpose for various indications. Williams et al [15] studied the prescriptions of 200 consecutive patients admitted into ICU. Snehapallavi et al [16] studied 218 patients included. Ahmad et al [17] analysed the prescriptions of around 200 patients in their study that contained at least one antibiotic. Drupad et al [18] studied the prescriptions of a total of 202 cases admitted to the ICU during their study period.

Age distribution

In the present study, majority of the patients ie, 43.3% (130/300) were among 31-40 years, followed by 16.6% (50/300) patients among 41-50 years.

In the study by Williams et al [15] the average age of the patients was 49 years (± SD 19.5). Snehapallavi et al [16] study had total 218 patients of which 28 patients were below 18 years, 59 patients were between 18 to 30 years, 95 patients were between 31-60 years and 36 patients were above 60 years. Ahmad et al [17] in their study observed that patients in the age group of 30-60 years (48.5%) were prescribed maximum antibiotics and patients in the age group of 12 years or less (8.5%) were prescribed the least amount of antibiotics.

Gender distribution

The present study showed male predominance (66.6%) compared to females (33.3%) and the male to female ratio was 2:1. Williams et al [15] included 131 male and 69 female patients with male to female ratio of 1.8:1. Ahmad et al [17] observed a male to female ratio of 1.2:1.

Indications for antibiotic prescriptions

In the present study, on clinical diagnosis respiratory tract infections were the most common indications and were seen in 50% (150/300) cases and antibiotics were prescribed in high percentage. Next common indications were viral fever (16.6%), urinary tract infection (10%). Pyrexia of unknown origin in 6.6 % cases. There were 6.6% cases each of pyrexia of unknown origin and of acute gastroenteritis. There were 1.6% cases each of meningitis and infections in anaemic patients. Williams et al [17] in their study observed that most of their patients were admitted to the ICU from the medical specialty (69.5%) and the most common diagnosis at admission was sepsis syndrome (61 patients). Ahmad et al [17] in their study observed respiratory tract infections as the most common clinical condition in hospitals for which antibiotics were prescribed in high percentage (21.5%), followed by viral fevers (12%), UTI (8.5%), and acute gastroenteritis (7.5%). Drupad et al [18] in their study reported Respiratory conditions (33.2%), febrile illness (15.3%), poisoning (15.3%) and CNS (12.9%) illnesses for which antibiotics were prescribed. Our observations compare well with the above authors.

Table 5 Comparison of distribution of antibiotics with other studies

Antibiotics	Ahmad et al [17]	Snehapallavi et al [16]	Present study
Cephalosporins	125 (62.5)	174 (51%)	205(58.5%)
Pencillins	32 (16)	8 (2%)	4(1.1%)
Aminoglycosides	23 (11.5	34 (10%)	35(10%)
Quinolones	33 (16.5%)	42 (12%)	40(11.4%)
Nitroimidazoles	28 (14%)	33 (10%)	35(10%)
Tetracyclines	-	4 (1%)	3(0.8%)
Beta lactamase inhibitors		32 (9%)	28(8%)
Others	7 (3.5%)	17(5.2%)	-
Total	248	344	350

In the study by Kapure et al [19] cephalosporins were the most preferred antimicrobials followed by quinolones and aminoglycosides. Fluconazole was found to be most commonly prescribed antifungal

whereas artesunate and metronidazole were most preferred antimalarial and antiamoebic drugs.

In the study by Drupad et al [18] also cephalosporins (81.7%) were commonly prescribed followed by nitroimidazoles (30.2%) and penicillin (16.3%). Also ceftriaxone (43.1%) and cefixime (38.6%) were commonly used followed by pipercillin + tazobactum combination (9.4%).

Table 6 Comparison of pattern of prescription with other study

Pattern of prescription	Ahmad et al [17]	Present study
Monotherapy	139 (69.5%)	290 (82.8%)
Poly therapy	61 (30.5%)	60 (17.1%)
Total	200	350

In the study by Kapure et al [19] it was observed that 75 % of patients were prescribed 1-2 antimicrobial agents and 25 % were prescribed 3 or more than 3 antimicrobials.

In the study by Snehapallavi et al [16] out of 218 prescriptions, 118 (54%) prescriptions had antibiotic monotherapy, 75 (34%) prescriptions had two antibiotic drugs, 21 (10 %) prescriptions had three antibiotic drugs, 4 (2%) prescriptions had more than three antibiotic drugs.

Route of administration

In our study, out of 350 antibiotics prescribed 290 (82.8%) were given parenteral and 60 (17.1%) were given orally. Snehapallavi et al [16] reported that of 344 antibiotics prescribed in their study, 258 (75%) were administered parenterally, 82 (24%) were oral administrations and 4 (1%) were topical administrations.

CONCLUSION

Various clinical conditions across all age groups require use of antibiotics. Respiratory tract infections are the most common indications for prescribing antibiotics. Cephalosporins and quinolones are the most commonly preferred antibiotics by the clinicians. Antibiotic monotherapy is commoner than usage of multiple antibiotics. Rational use of appropriate antibiotics can obviate drug resistance in future and continuous monitoring of anitibiotic usage in hospitals is recommended.

REFERENCES

[1]. Strom BL, Stephan EK. editors. Pharmacoepidemiology. 4th ed. Wiley-Blackwell: John Wiley and Sons, English; 2005.
[2]. Gross F. Drug utilization therapy and practice: The present situation in the Federal Republic of Germany. Eur J Clin Pharmacol 19, 1981, 387-94.
[3]. Cochrane et al. Effectiveness and efficiency – random reflections on health services. London, the Nuffield provincial hospitals trust, 1982.
[4]. Stolley PD, Lasagna L. Prescribing patterns of physicians. Journal of Chronic Diseases 22, 1969, 395-405.
[5]. Westerholm B. Therapeutic auditing at the national and international levels. Br J Clin Pharmacol 22, 1986, 55s-9s.
[6]. Pullar T, Kumar S, Tindall H, Freely M. Time to stop counting the tablets? Clin pharmacol Ther 46, 1989, 163-8.
[7]. Ahmad A, Parimalakrishnan, Mohanta GP, Patel I, Manna PK. A study on utilization pattern of higher generation antibiotics among patients visiting community pharmacies in Chidambaram, Tamilnadu at South India. Int J Pharm.
[8]. Arnold SR, Allen UD, Al-zahrani M, Tan DH, Wang EE. Antibiotic prescribing by pediatricians for respiratory tract infection in children. Clin Infect Dis 29, 1999, 312-7.
[9]. Mccaig LF, Hughes JM. Trends in antimicrobial drug prescribing among office-based physicians in the United States. JAMA 273, 1995, 214-9.
[10]. Esposito S, Leone S. Antimicrobial treatment for intensive care unit (ICU) infections including the role of the infectious diseases specialist. Int J Antimicrob Agents 29, 2007, 494–500.

[11]. Lockhart SR, Abramson MA, Beekman SE, Gallagher G, Riedel SR, Diekma DJ, et al. Antimicrobial resistance among gram-negative bacilli as causes of infections in intensive care unit patients in the United States between 1993 and 2004. J Clin Microbiol 45, 2007, 3352–9.

[12]. Weber RJ, Kane SL, Oriolo VA, Saul M, Skledar SJ, Dasta JF. Impact of intensive care drug costs: a descriptive analysis, with recommendations for optimizing ICU pharmacotherapy. Crit Care Med. 31, 2003, 17–24.

[13]. WHO model lists of essential medicines 19 th edn. Geneva: World Health Organization; 2015

[14]. Bapna JS, Tekur U, Gitanjali B, Shashindran CH, Pradhan SC, Thulasimani M, et al. Drug utilization at primary health care level in Southern India. Eur J Clin Pharmacol 43, 1992, 413-5

[15]. Williams A, Mathai AS, Phillips AS. Antibiotic prescription patterns at admission into a tertiary level intensive care unit in Northern India. J pharm Bioallied Sci 3(4), 2011, 531–536.

[16]. Snehapallavi P, Tejasree B, Krishnakanth PV. Study of prescription patterns of antibiotics in tertiary care hospital. International Journal of Biomedical Research 7(6), 2016, 372-374.

[17]. Ahmad A, Revanker M, Haque I, Pravina A, Ivan R, Dasari R, et al. The prescription pattern of antibiotics in the medicine department in a teaching hospital: a descriptive study IJTPR 6(3), 2014, 43-46.

[18]. Drupad HS, Nagabushan H, Prakash GM. Prospective and observational study of antimicrobial drug utilization in medical intensive care unit in a tertiary care teaching hospital. International Journal of Pharmacology 6(1), 2016, 13

[19]. Kapure NL, Nayak BB, Raul AR, Vijaykumar AN, Vijayprasad S, Vakade KP, et al. Study of prescribing pattern of antimicrobial agents in an IPD of a tertiary care hospital in Ahmednagar. International Journal of Medical Research and Health Sciences 3(1), 2013.