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Prospective observational study to determine Analysis of Antibiotic Use at tertiary care rural based, teaching hospital at Ujjain, Madhya Pradesh.

Tiwari Pawan, Chouhan Vijay, Chourishi Ashutosh

R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India

Correspondence Author: Chouhan Vijay, R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India

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Abstract

Background: A prospective observational study was conducted in Department of Pharmacology, R. D. Gardi Medical College in collaboration with Medicine Department, Chandrikaben Roopchand Gardi Hospital (C.R.G.H), Ujjain. Main aim of this study was to study the current drug prescribing trend and to comment on rationality of the prescribed medicines in management of indoor patient of Medicine department in a rural teaching hospital attached to a medical college located in Ujjain, Madhya Pradesh.

Key words: Antibiotics, antibiotics use, tertiary care, polypharmacy.

Methods: A prospective observational study was conducted from May 2014 to June 2015, in R D Gardi Medical College & Hospital, a 600 bedded tertiary care rural based, teaching hospital at Ujjain, Madhya Pradesh. The protocol was prepared and presented to and approved by the same. Ethical approval to carry out the study was sought from Human Research Ethics Committee of the institute, Approval Reference Number: IEC-RDGMC-387. For the prescription survey, informed consent from patients was not required because data was abstracted from stored patient records (prescriptions, patient files records).

Results: In encounters where an antibiotic was prescribed, total number of antibiotics prescribed was 453. Antibiotics were prescribed in 312 patients of total 809 prescriptions. While 43.04 %(n=195) of the prescriptions had one antibiotic, 20.5 %(n=93) had two antibiotics and 5.29 %(n=24) had three or more antibiotics prescribed. Average number of antibiotic per patient was 1.45 while average duration of antibiotic prescription is 6.1 days.

Introduction: Medicines are important weapons in the fight against diseases. Modern healthcare would be a dream without medicines. However, medicines are “double-edged swords” and therefore, they should be used rationally. According to World Health Organization (WHO), rational use of drugs requires that “patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, at the lowest cost to them and their community”[1]. Irrational drug use is an enormous problem with several undesirable consequences such as increased cost of drug therapy, increased risk for adverse drug reactions, emergence of drug resistance, wastage of resources and reduction in the quality of drug therapy[2].

Medicines play an important role in health care delivery and disease prevention. The availability and affordability of good quality drugs along with their rational use is needed for effective health care. However, irrational drug use is prevalent, especially in the developing countries due to irrational prescribing, dispensing, and administration of medications[3]. Also, the World Health

Organization (WHO) reports that more than half of all medicines are prescribed, dispensed or sold inappropriately and that half of all patients fail to take them correctly[4]A number of factors influence prescribing practices. These include prescriber-related factors, patient-related factors, industry-related factors and disease-related factors. Prescribing practices should be evaluated periodically so as to provide feedback to prescribers which in turn increases the quality of drug therapy, reduces wastage of resources and lowers risk for adverse drug reactions among other benefits[5]. Resistant bacteria spread rapidly in these countries due to setting specific factors, such as overcrowding, poor sanitation, and a warm-humid climate. Rising rates of bacterial resistance is increasingly seen as a global problem[6].Optimal use of antimicrobial prophylaxis includes proper case selection; use of appropriate agents; proper dosing, route of administration, timing and duration when appropriate. Effective use of antimicrobial prophylaxis also requires monitoring of and feedback on patterns of use. Programs to improve antimicrobial prophylaxis should be multidisciplinary and should aim to improve use of medications, not simply to change physician practice patterns[7].

Material and Method: A prospective observational study was conducted from May 2014 to June 2015, in R D Gardi Medical College & Hospital, a 600 bedded tertiary care rural based, teaching hospital at Ujjain, Madhya Pradesh. The protocol was prepared and presented to and approved by the same. Ethical approval to carry out the study was sought from Human Research Ethics Committee of the institute, Approval Reference Number: IEC-RDGMC-387. For the prescription survey, informed consent from patients was not required because data was abstracted from stored patient records (prescriptions, patient files records).

Study Site: The study was conducted in Department of Pharmacology, R.D.Gardi Medical College in collaboration with Department of Medicine, Chandrikaben Roopchand Gardi Hospital (C.R.G.H), Ujjain.

Study population: The study population included all prescriptions/ patient encounters from inpatient departments written between 1st January and 30th June 2015 which were received, processed and stored at the hospital's inpatient case records file of medicine department. Total 809 patients were included in this study.

Observations and Results

The presentation of the results and their analysis is based on the collected data. The data were collected from Department of Medicine of R.D. Gardi Medical College & Hospital, Ujjain during a period of 12 months (May 2014 to June 2015). A total of 809 prescriptions were observed during the study period. A total of 5188 drugs were prescribed.

In encounters where an antibiotic was prescribed, total number of antibiotics prescribed was 453. Antibiotics were prescribed in 312 patients of total 809 prescriptions. While 43.04 %(n=195) of the prescriptions had one antibiotic, 20.5 %(n=93) had two antibiotics and 5.29 %(n=24) had three or more antibiotics prescribed. Average number of antibiotic per patient was 1.45 while average duration of antibiotic prescription is 6.1 days.

Table 01: Number of antibiotics prescribed per encounter.

No. of antibiotics	No. of patients (%)
1	195 (43.04%)
2	93 (20.52%)
>3	24 (5.29%)
Total	**312 (100%)**

Most of the times (76%) antibiotics were given in management of infectious disease while only 24% of antibiotic encounter was used for the prophylaxis.

Figure 01: Antibiotic Usage Indication.

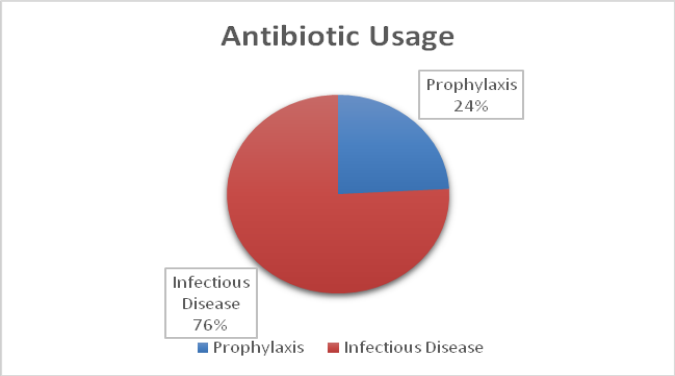


Figure 02: Number of antibiotics prescribed per encounter.

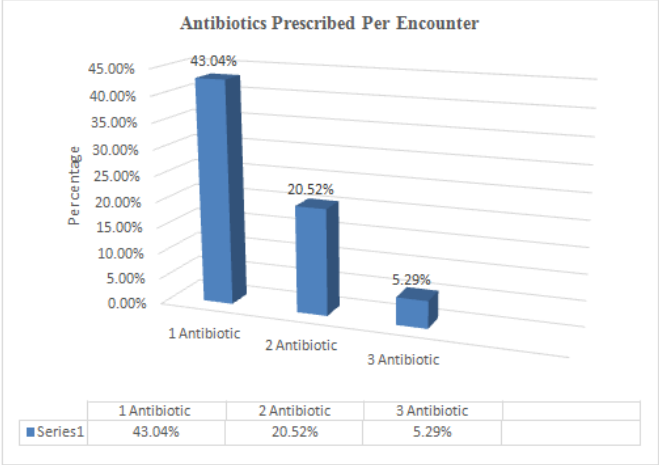
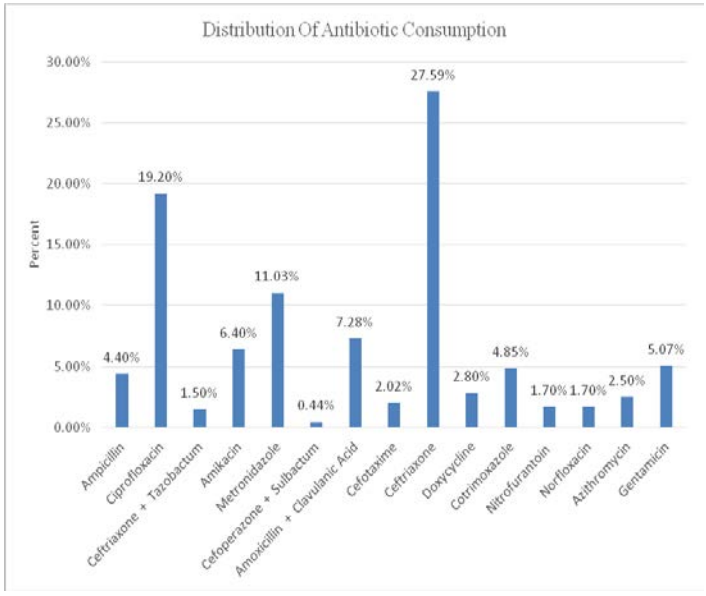


Table 02: Different Antibiotics Consumed.

Drugs	Percentage % (n=453)
Ceftriaxone + Tazobactum	1.50(7)
Amikacin	6.4(29)
Cefoperazone + Sulbactum	0.44(2)
Metronidazole	11.03(50)
Ciprofloxacin	19.20(87)
Amoxicillin +Clavulanic Acid	7.28(33)
Cefotaxime	2.02(10)
Ampicillin	4.4(20)
Ceftriaxone	27.59 (125)
Cotrimoxazole	4.85(22)
Doxycycline	2.83(13)
Nitrofurantoin	1.72(8)
Norfloxacin	1.7(8)
Azithromycin	2.5(12)
Gentamicin	5.07(23)

Among various antibiotic usage in the hospital, ceftriaxone was the most frequently prescribed antibiotic (27.59%) followed by ciprofloxacin (19.20%), and Metronidazole (11.03%) in the order.

Figure 03: Distribution of Different Antibiotics Consumed.



Discussion: Based on the results seen in this prospective observational study conducted from (May 2014 to June 2015), in Medicine Department of Chandrikaben Rashmikant Gardi Hospital, Ujjain, M.P. A total of 809

prescriptions were observed during the study period. A total of 5188 drugs were prescribed. A total of 809 prescriptions were observed during the study period. A total of 5188 drugs were prescribed. There were more male 51.29% (n=415) compared to the female group 48.70% (n=394). More patients were from the age group 41-50 years 27.07% (i.e.94 males and 125 females). Percentage of encounter with an Antibiotic prescribed was 38.44%. The average number of drugs per prescription is an important parameter while doing a prescription audit. Average number of drugs per prescription was 6.41. This mean number of drugs per prescription is higher than that reported in a previous study.Another study in a tertiary hospital based study in India had reported a mean number of two drugs[8].The mean number of drugs was more than two in other studies reported in the literature[9].

Average Antibiotic prescribed per patient was 1.45 and average Duration was 6.1 days. However, in the present study, the low rate of antibiotic prescription does not indicate that the prescription pattern is better than in other countries, as no clinical determinants were documented in any prescription as criteria for justifying prescribing an antibiotic. It is worth noting that both under- and over-prescribing of antibiotics pose important problems in clinical practice.During the study period, the most commonly prescribed antibiotic was ceftriaxone (29.6%) followed by ciprofloxacin (19.2%). Total number of antibiotics prescribed was 453. Antibiotics were prescribed in 312 patients; majority 195 patients (43.04%) of them were prescribed one antibiotics. Among them ceftriaxone was the most frequently prescribed antibiotic (27.59%).

To conclude the study some of the use antibiotics showed deviation from the standard values recommended by WHO. This indicated some degree of irrational/inappropriate use in the hospital, particularly polypharmacy, underuse of international non-proprietary names (generic names), over prescription of antibiotics.

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