



Drug Utilization Evaluation of Antibiotics in District Hospital Baurari Tehri Uttarakhand

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Abstract

Drug utilization is important for all drugs especially for antibiotic as they are widely used in hospitals and have a potential to be resistant hence this study was conducted to access the drug utilization evaluation of antibiotics in district hospital Baurari Tehri Garhwal .It was a retrospective study in which a total of 107patient records were analyzed Male to female ratio was 1:1.2 Majority of the patients 40 (37%) were in 41-60 years age. Fever was the major indication in our study. Highly prescribed antibiotic was ceftriaxone. A total of 1064 drugs were prescribed average number of drugs per prescription was 8.44. Percentage of drug by generic name was 33. Percentage of antibiotic prescribed was 82. Percentage of encounters with an injection was 57. Percentage of drugs with EDL was 66.The study concluded presence of poly pharmacy and higher frequency of injections.

Keywords

Antibiotics, Drug Utilization, poly Pharmacy

INTRODUCTION

Drug utilization is defined by the WHO as the “marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences”. Drug utilization studies help to recognize and report irrational prescribing, which adds on to patient morbidity and economic burden. DUE studies are required for all drugs in general and particularly for antibiotics because they are the most frequently prescribed drugs among hospitalized patients.¹ The prevalence of antibiotic use is very high in India and ranges from 24 to 67%.¹ Beg et al as per kunin’s criteria it was observed that 64% of total antibiotics prescribed were either not indicated or inappropriate in terms of drug or dosage and was estimated that in India, they account for over 50% of

the value of drugs sold.² ghosh et al 2013. The widespread use of antibiotics has led to the emergence of several resistant strains of microbes. These contribute significantly towards rise in the escalating health care costs and patient morbidity and mortality Therefore monitoring and evaluation of prescribing patterns of antimicrobial agents are one of the recommended strategies to control resistance and also to improve the prescribing practices.³ Chaudhary K P 2015 Keeping these facts in mind the present study was conducted in District hospital (Baurari) Tehri.

MATERIALS AND METHODS

A hospital-based retrospective, observational and cross-sectional study, involving patients records with antibiotics was planned and conducted over a period

of 2 months from October 2016 to November 2016 in District Hospital, Baurai Tehri, Uttarakhand, India. Approval was obtained from hospital for the study. Inclusion criteria was BHT with antibiotics while BHT without antibiotics or incomplete BHT were excluded. Treatment charts from the October 2016 to November 2016 were randomly selected at a regular interval of 3. Data collection was done using a predesigned proforma which included patient characteristics such as age, gender, diagnosis, and prescription characteristics such as name of the drug, strength and dosage form, whether prescribed in generic name or not which was used to access WHO prescribing indicators were assessed such as: (1) average number of the drugs per prescription, (2) percentage of the drugs prescribed by generic name, (3) percentage of encounters in which an antibiotic was prescribed, (4) percentage of encounters with an injection was prescribed, (5) percentage of the drugs prescribed from an essential drug list.

The methodology used to calculate core WHO prescribing indicators is described as under

1. Average number of drugs per encounter: Average, calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed. It is not relevant whether the patient actually received the drugs.

2. Percentage of drugs prescribed by generic name: Percentage, calculated by dividing the number of drugs prescribed by generic name, by the total number of drugs prescribed, multiplied by 100.

3. Percentage of encounters with an antibiotic prescribed: Percentage, calculated by dividing the number of patient encounters during which an antibiotic is prescribed, by the total number of encounters surveyed, multiplied by 100.

4. Percentage of encounters with an injection prescribed: Percentage, calculated by dividing the number of patient encounters during which an injection is prescribed, by the total number of encounters surveyed, multiplied by 100.

5. Percentage of drugs prescribed from essential drugs list or formulary: Percentage, calculated by

dividing the number of products prescribed which are listed on the essential drugs list or local formulary (or which are equivalent to drugs on the list).

In addition, The Index of Rational Drug Prescribing (IRDP) was calculated through Zhang and Zhi index system. For the calculation of indices (index of nonpoly-pharmacy, index of rational antibiotic use and index of safe injection drug use) following formula was used $\text{Index} = \frac{\text{Optimal value}}{\text{Observed value}}$. However, indices Generic and EDL were calculated by formula

Index = Observed value / Optimal value.

The optimal index for all indicators was set as 1. The values closer to 1 indicated rational drug use. The Index of Rational Drug Prescribing (IRDP) was calculated by adding the index values of all prescribing indicators.

All data was entered into Microsoft Excel and subsequently statistically analyzed using the same. The mode of data analysis was age distribution, sex ratio, prescription analysis using WHO drug indicators. All antibiotic drugs were coded as per the WHO Anatomical Therapeutic and Chemical Classification (ATC) coding. Data was expressed as percentages

RESULTS

In our study a total of 107 patient records were analysed. Male to female ratio was 1:1.2 (Table 1). Majority of the patients 40 (37%) were in 41-60 years age, followed by 38 (36%) in 21-60 years (Table 2). Fever was the major indication in our study and was diagnosed in 37 cases. Majority of antibiotic prescribed was ceftriaxone. A total of 1064 drugs were prescribed. Average number of drugs per prescription was 8.44. Percentage of drug by generic name was 33 (Table 4). Percentage of antibiotic prescribed was 82 (Table 5). Percentage of encounters with an injection was 57 (Table 6). Percentage of drugs with EDL was 66 (Table 7).

Table 1: Gender wise distribution of patients

Gender	Frequency	Percentage
Male	50	47
female	57	53
Total	107	100

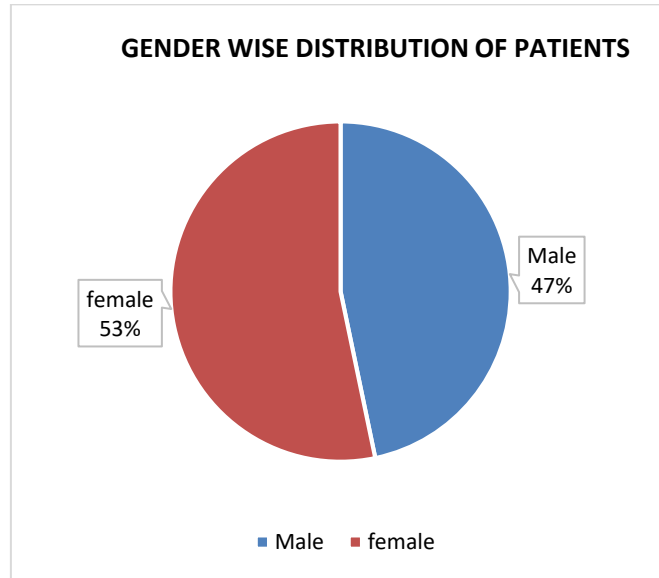
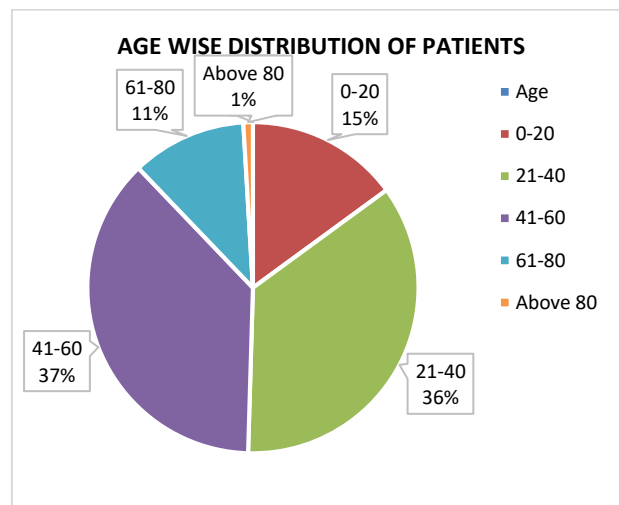


Table 2: Age wise distribution of patients

Age group	October	November	Total	Percentage
0-20	12	4	16	15
21-40	20	18	38	36
41-60	27	13	40	37
60-80	6	6	12	11
Above 80	1	1	1	1



DIAGNOSIS PATTERN

Diagnosis	Frequency
Pain abdomen	10
Abscess	1
Cataract	6
Chest pain	1
Colitis /vomiting	2
COPD	2
Dehydration	1
Loose motion	5

Diagnosis	Frequency
Dizziness	1
fever	15
Enteric fever	7
Injury	7
Haematuria	1
Jaundice	1
Labour Pain	2
Poisoning	1
Pyrexia	15
RTA	1
Shivering	1
Swelling	1
Tingling	1
Ulcer	1
UTI	2
Unknown	8
Animal bite	1
Boiler	1
BPV	1
Cellulitis	2
Cold	1
Dengue	1
Diabetic foot nephropathy	1
ELCE	1
Epigastric Pain	1
Gastritis	1
Piles	1
Vomiting	2
Total	107

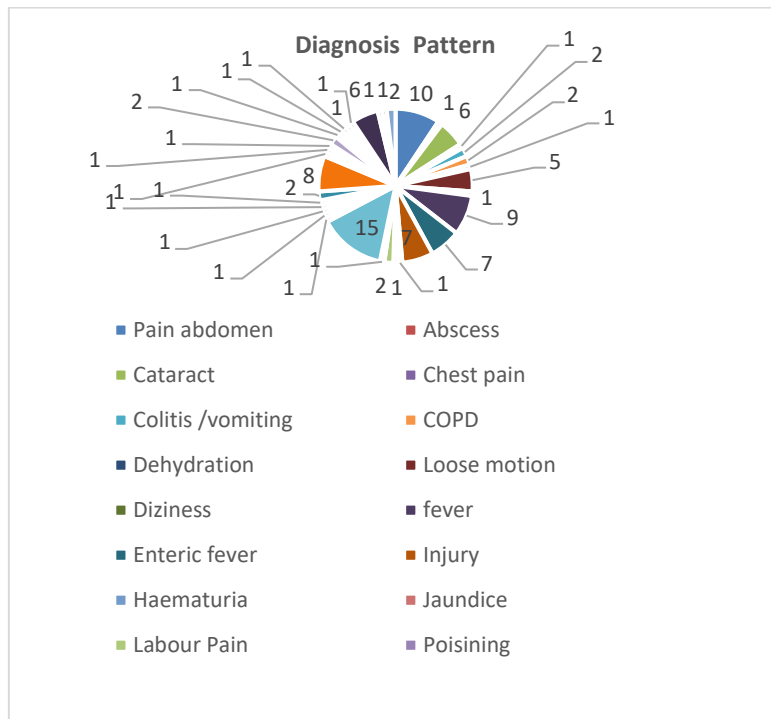
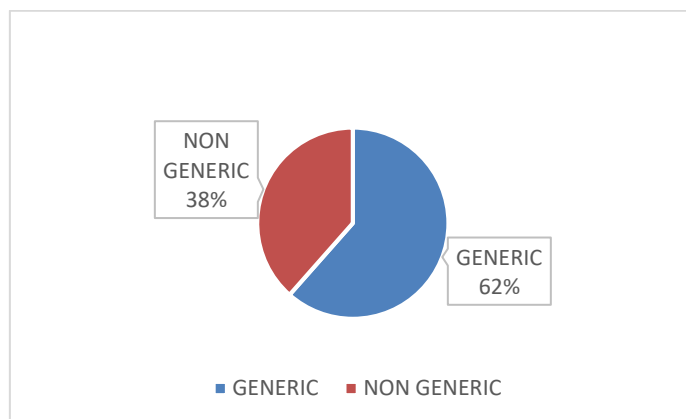
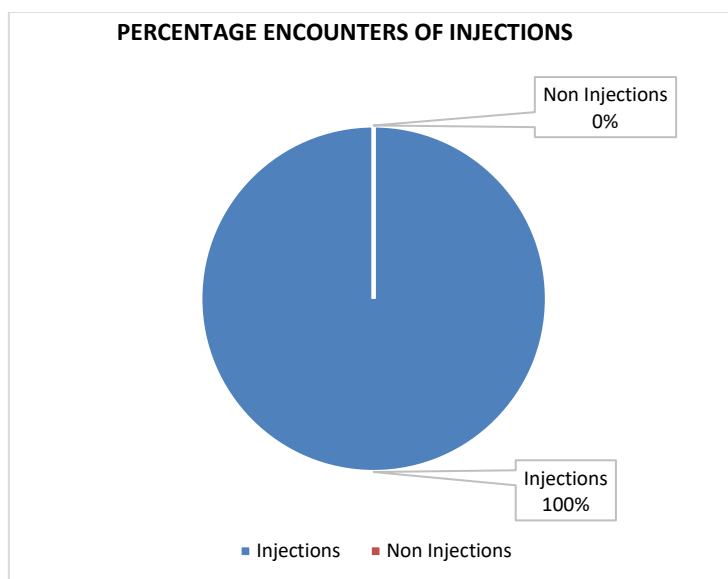


Table 4- Percentage of Drugs Prescribed By Generic Name

Drug	Frequency	Percentage
Generic	638	33
Non-Generic	399	67
Total	1037	100


Table 5- Percentage of Encounters with an Injection Prescribed

Encounter	Frequency	Percentage
Injections	107	100
Non-Injections	0	0
Total	107	100


Table 6- Percentage Of Encounters With An Antibiotic Prescribed

Encounter	Frequency	Percentage
Antibiotic	107	100
Non-Antibiotic	0	0
Total	107	100

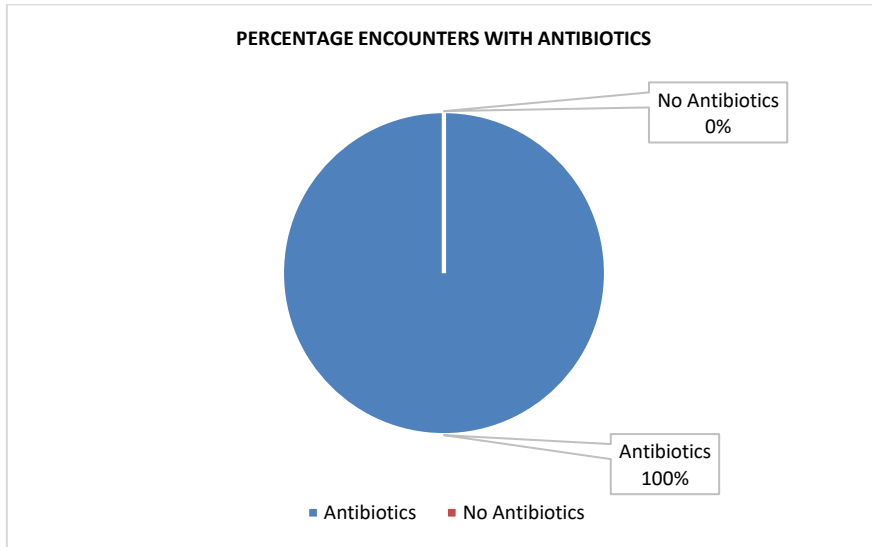


Table 7- Percentage of Drugs Prescribed from Essential Drugs List

Percentage By EDL	Frequency	Percentage
EDL	708	66
NON EDL	330	34
TOTAL	1038	100

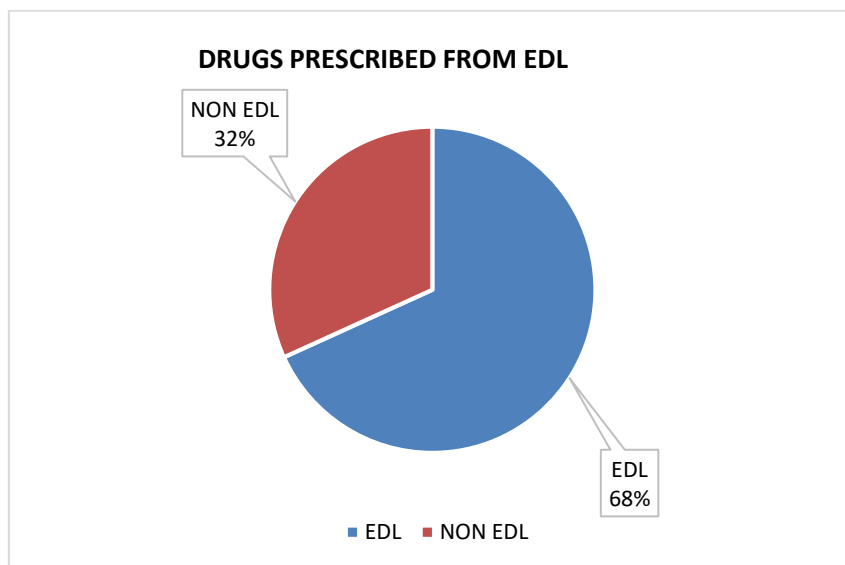


Table 8 Index of Rational Drug Prescribing

IRDP index	Optimal value	Observed value	Optimal/ Observed value
Non-polypharmacy index	3	10	0.3
Index of rational Antibiotic prescribing	30	100	0.3
Index of rational Injection prescribing	24	100	0.24
Generic Prescribing index	62	100	0.62
Essential	68	100	0.68

IRDP index	Optimal value	Observed value	Optimal/ Observed
Medicines index			
IRDP			2.14

DISCUSSION

In our study 16 patients were from age group 0-20 Majority of patients were from age group 21-40 and 41-60 comprising 38 and 39 patients compromising of total patients and others belong to age group 0-20 and 60-80 were This is comparable to study done by Muriah etal where majority of patients were n between age of 40 and sixty. In our study female prominence was seen with a male female ratio of 1. 1.2. Same was observed in a study by Kaliamoorthy etal and Venu Gopal where female patients were higher than male patients.^{6,7,8}

Ceftriaxone was the most commonly prescribed antimicrobial agent in our study which is also reported by Beg etal ,Muriahetal Kumar etal. The reason being low incidence of ADR and excellent penetration to the body tissues and wide coverage to all bacteria. Cephalosporin was followed by penicillin. This pattern has been seen in previous studies by Beg etal and Sharma etal where amikacin was the preferred drug.^{1,6,9}

Average no of drug per encounter was 10 in our study this value is consistent with study of bhansali etal where it was reported 9.03. Similar high range value was reported from study by Sapkotaetal where this value was 9.8. In a study by Beg etal in dehradun, Uttarakhand and Chaudhry etal in Etawah , Uttar Pradesh reported average number of drugs per prescription was 5.13 and 4.05 which is lower than our study. Ideally the mean number of drugs per prescription should be as kept minimum since higher values increase the risk of drug interaction, risk of bacterial resistance, non-compliance, and cost of the treatment.^{1,10,11,3.}

According to WHO standards, every drug must be prescribed with generic name. This is to avoid confusion between different classes of drugs with near about similar brand names while dispensing and also to decrease the cost of therapy. The generic prescribing in our study was 61.52% This is similar to values of other study by Muriah etal where this value was 60 %. The value is lower than the study conducted by Chaudhry etal , Sharma etal 2018 and Pathak etal 2016 where it was reported to be 78 %, 98.1 % and 89.88%. However, this value is higher than study conducted by Bachewaretal where it was reported as 13.88%.^{3,10,12,13}

All of the prescriptions had injectable antibiotic preferably as cases were from indoor setting. Beg

etal., This trend is observed in study by Randad etal and Bhansali etal where all patients were prescribed antibiotics. Prescribing more injections per prescription are of concern, as they may lead to adverse effect of possible use of unsafe syringes, transmit HIV, hepatitis B and C and increase cost of treatment.^{14,15,16}

Lists of essential medicines also guide the procurement and supply of medicines in the public sector, schemes In our study 68.27 % drugs were from WHO essential list of medicine. The results were similar to study conducted by Bachewar etal, Satish Kumar et al, and Pathak et al, i.e.72.36% 71.03 and 76.06%.^{8,14.} However it was higher than study done by Chaudhry etal and Meena et al. where observed value was 61% and 45.50% respectively.^{3,14} The IRDP value in our study was reported to be 2.14. The higher value 2.71 was reported by study by Cole etal. in Sierra Leone⁵

CONCLUSION

Poly pharmacy and higher frequency of injections use reported in the present study could be influenced by the fact that only in-patients were included in the study. Laboratory should be strengthening to provide culture sensitivity testing practice of framing antibiograms should be stressed rational drug use must be promoted through educating and updating clinicians through CME, seminar by providing them standard treatment guidelines, essential drug list and antibiotic policy. Generic prescribing should be enhanced by prescribers. Empirical prescribing should be finally replaced by definitive therapy through proper testing and use of antibiotic sensitivity testing.

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