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Review Article

## Drug utilization evaluation of antibiotics in district hospital Rudraprayag

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### ABSTRACT

Drug utilization is very important for antibiotics as they are widely used in hospitals and their inappropriate use may lead to resistance. To check this irrational use of antibiotics and promote rational use the present retrospective study was conducted to access drug utilization evaluation of antibiotics in inpatient department of District Hospital Rudraprayag for a period of three months. Overall 126 patients records were encountered in the study in which male female ratio was 1:2. Prominent age range was 21-40. Overall 1064 drugs were prescribed average number of drug per prescription was 8.44. Percentage of drug by generic name was 33. Percentage of antibiotic prescribed was 82.74. Percentage of drugs with EDL was 66.16. Study results revealed poly-pharmacy, brand prescribing as common trends. Study showed need to promote prescribers to follow generic prescribing and use injectable and antibiotics rationally to prevent development of resistance in hospital and community.

**Keywords:** Antibiotic resistance, Drug utilization, Antibiotics

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### INTRODUCTION

Irrational use of medicines is widespread throughout the world, particularly the antimicrobials<sup>1</sup>. Need of antibiotics high in the developing countries where infective diseases burden is high. In fact India has the highest burden of infectious disease in the world which make the inappropriate use of antibiotic a common phenomenon here.<sup>2,3</sup>.

Drug utilization (DU) studies are very important for almost all therapeutic drugs especially antibiotics<sup>4</sup> as they are widely used in hospitals and community<sup>3</sup>. In India prevalence range of antibiotic use is 24 to 67 % which causes its widespread use majorly in an irrational way that ultimately leads to emergence of resistance.<sup>2</sup> Antibiotic resistance is a global problem more prevalent in developing countries like India.<sup>2,3</sup>

Hence the present study was planned to examine the drug utilization evaluation of antibiotics in the IPD of District Hospital Rudraprayag.

### MATERIALS AND METHODS

After obtaining approval from the hospital the study was conducted in the inpatient department of district hospital Rudraprayag.

Inclusion criteria: BHT with antibiotics

Exclusion criteria: BHT without antibiotics or incomplete medical records

Study period: April 2017 to June 2017

Study Type: Retrospective

Study material Data Entry Form

Source of data Patient Records /BHTs

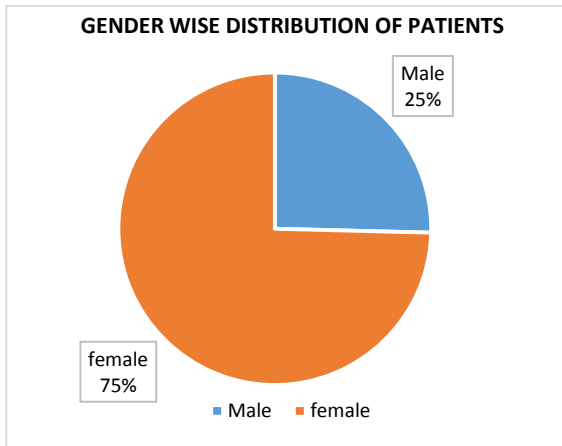
Statistical Analysis: The data was subjected to descriptive analysis by microsoft excel. Antibiotics were classified in groups as per ATC classification. Utilization of drugs was analyzed as per WHO prescribing indicators and presented as percentage.

### RESULTS

In our study a total of 126 patient records were analyzed Male to female ratio was 1:2 (Table1) Majority of the patients 79 (63%) were in 21-40 years age, followed by 18 (14%) in 41-60 years (Table2). Majority of antibiotic prescribed was ceftriaxone (Table3). A total of 1064 drugs were prescribed average number of drug per prescription was 8.44. Percentage of drug by generic name was 33 (Table 4). Percentage of antibiotic prescribed was 82 (Table5). Percentage of encounters with an injection was 57 (Table 6). Percentage of drugs with EDL was 66 (Table7).

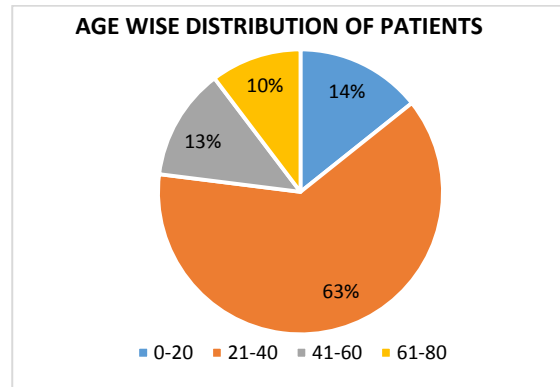
**Table 1: Gender wise distribution of patients**

Gender	Frequency	Percentage
Male	32	25
Female	94	75



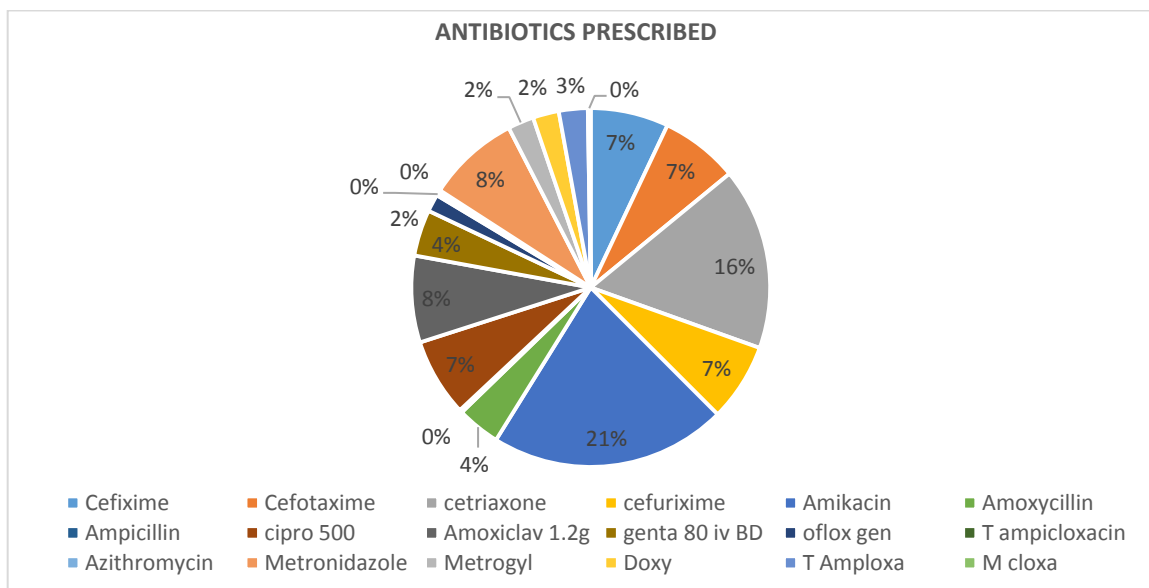
**Table 2: Age wise distribution of patients**

AGE GROUP	FREQUENCY	PERCENTAGE
0-20	18	14
21-40	79	63
41-60	16	13
61-80	13	10



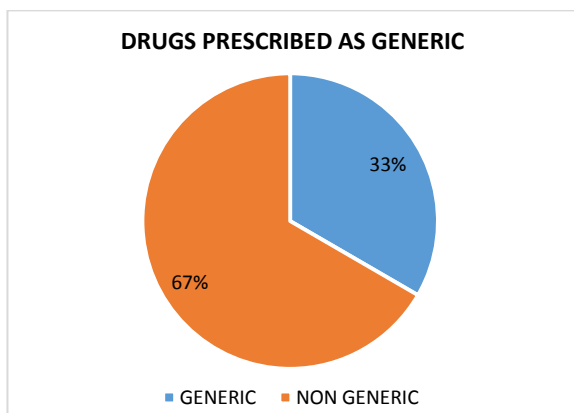
**Table 3: Commonly prescribed antibiotics along with ATC code**

S.No.	Antibiotics	ATC Code	Frequency
1	Cefixime	J01DD08	27
2	Cefotaxime	J01DD01	27
3	Ceftriaxone	J01DD04	63
4	Cefuroxime	J01DC02	27
5	Amikacin	J01GB06	82
6	Amoxycillin	J01CA04	15
7	Ampicillin	J01CA01	1
8	Ciprofloxacin	J01MA02	27
9	Amoxyclav	J01CR02	30
10	Gentamycin	J01GB03	16
11	Ofloxacin	J01MA01	6
12	T ampicloxacin	J01CA51	12
13	Azithromycin	J01FA10	1
14	Metronidazole	J01XD01	32
15	Metrogyl	J01XD01	9
16	Doxycycline	J01AA02	9
	<b>Total</b>		<b>384</b>



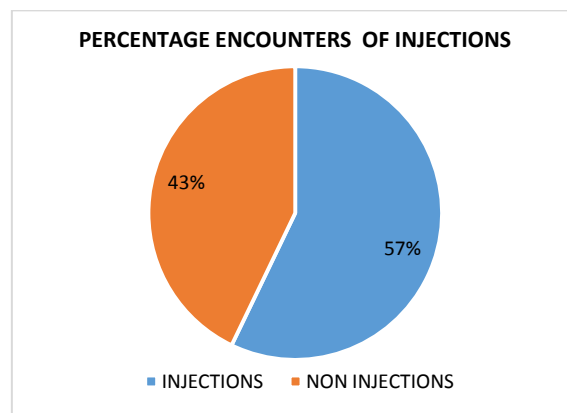
**Table 4: Percentage of drugs prescribed by generic name**

Drug	Frequency	Percentage
Generic	355	33
Non Generic	709	67
Total	1064	100



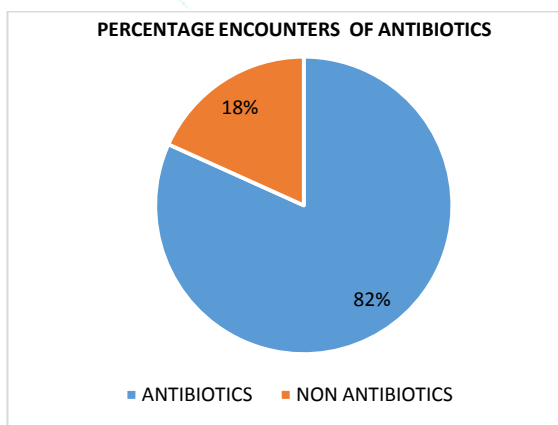
**Table 6: Percentage of encounters with an injection prescribed**

Encounter	Frequency	Percentage
Injections	72	57
Non Injections	54	43
Total	126	100



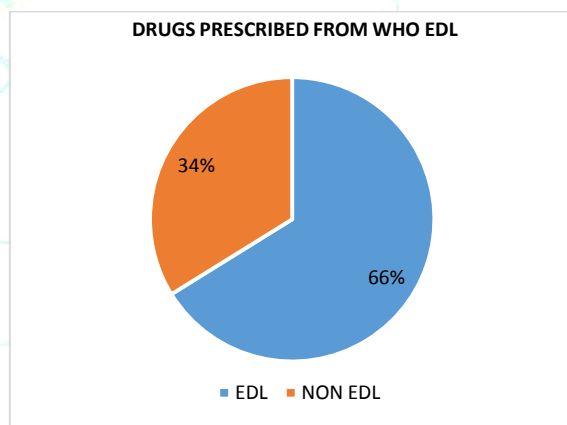
**Table 5: Percentage of encounters with an antibiotic prescribed**

Encounter	Frequency	Percentage
Antibiotic	103	82
Non Antibiotic	23	18
Total	126	100



**Table 7: Percentage of drugs prescribed from essential drugs list**

Percentage by EDL	Frequency	Percentage
EDL	704	66
Non EDL	360	34
Total	1064	100



**DISCUSSION**

In our study a total of 126 patients records were analyzed among which 25 % were males and 75 % were females and Male: Female ratio was 1:3. The reason may be the higher use of gynecology services in the facility. Majority of patients were from age group 21-40 constituting 63% of total patients followed by followed age groups 0-20 and 41-60 and 61-80 constituting 14, 13 and 10 percent of total patient studied. This data is comparable to results of study done by Khan ML et al, Alam SN et al, Javaid M et al. where majority of patients were in the age group of less than 40 years.<sup>5</sup> In our study major patients had abdominal problems comprising of gynecological problems and abdominal pain followed by fever This trend was observed in study by Gopal et al., where antibiotics were prescribed for cold, abdominal pain, headache and fever.<sup>6</sup> Similar

results were reported from study by Neha et al. 2014 where third common diagnosis was gynecological.<sup>7</sup>

A total of 1064 drugs were prescribed out of which 348 were antimicrobials among which cephalosporins like ceftriaxone 63 and cefotaxime 27 were mostly used drug followed by aminoglycoside like amikacin 87. The cephalosporins were the most frequently prescribed antimicrobials in our study reason being their broad spectrum, convenient dosing regimens and less side effects. The widely used antimicrobial in our study was ceftriaxone which is in accordance with previous studies done by Beg et al in uttarakhand where ceftriaxone was most commonly prescribed. Particularly ceftriaxone is a third generation cephalosporin with broad spectrum of activity towards a wide range of organisms. A similar study conducted by Neha et al., 2014 also reported use of cephalosporin and aminoglycoside as the top two drugs

used.<sup>2,7</sup> Average number of drugs per person is an important index of prescription audit. Mean number of drugs per prescription should be kept to lowest to enhance rationality and prevent polypharmacy. Higher figures of promotes polypharmacy and increases the risk of adverse effects, interactions, and promotes emergence of antibiotic resistance.<sup>2</sup> In our study the average number of drugs per prescription was 8.44 which is comparable with study by Bhansali NB et al where it was reported up to 9.03.<sup>5,8</sup> Generic prescribing helps the hospital pharmacy maintain proper inventory control.<sup>9</sup> It also reduces the chances of dispensing errors probably be due to misinterpretation of like sounding names of drugs.<sup>11</sup> The percentage of drugs prescribed by generic name was 33.64% in our study which is higher than study conducted by Meena et al in Manipur where this generic prescribing percentage was 3.64. The generic prescribing promotes cost reduction and offers various alternatives making therapy affordable.<sup>10</sup> According to WHO 15-25% of prescriptions with antibiotics are expected in most of the developing countries where infectious diseases are more prevalent.<sup>11</sup> Percentage of antibiotic prescribed in our study was 81.74% which is higher than study done by Pankaj et al. in India but lower than study by Bhansali et al where it was found to be 100%.<sup>8,12</sup> Appropriate use of antibiotics is absolutely necessary to prevent emergence of drug resistance and should be used after culture sensitivity testing.<sup>11</sup> In this study number of prescriptions having injectable was 57.14 which is lower than the result of previous study done by Kumar et al where this value was reported to be 69%. Another study by Pathak et al from Uttar Pradesh reported this value to 24.05 which is lower than our study.<sup>8,11</sup> Percentage of drugs prescribed from EDL in our study was 66.15 which is higher than report of a

previous study by Bhansali et al. 2013 where this was reported to 45.71 and lower than value of study by Kumar et al. 2015 where this value was 71.3%. The drugs from the essential drug list should be promoted for the optimal use of resources, safety and to fulfill the health care needs of the majority of the population.<sup>5,8</sup>

## CONCLUSION

The worldwide increase in antimicrobial resistance is of great concern and it is the responsibility of the prescribers to develop good prescribing habits and prescribe in accordance of WHO prescribing indicators. Generic prescribing should be encouraged, brand prescribing should be restricted, average number of drugs per prescription should be kept minimum to prevent polypharmacy. Input output chart must be monitored for patients on gentamycin, amikacin as it has a nephrotoxic potential. In addition prescribers must be encouraged to make more use of laboratory investigations and must not depend solely on clinical diagnosis or empirical treatment. The hospital laboratory should be strengthened to conduct antibiotic sensitivity testing so that further prescribing could be done on basis of sensitivity test results. This can be achieved by educating and updating clinicians through CME, seminar by providing them standard treatment guidelines, essential drug list and role of sensitivity testing in rational antibiotic prescribing.

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