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DRUG UTILIZATION STUDY IN POST-OPERATIVE PATIENTS IN SURGICAL WARD OF A TERTIARY CARE TEACHING HOSPITAL, JODHPUR (WESTERN RAJASTHAN)

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ABSTRACT

Multidrug therapy before, during, and after surgery is mostly used in indoor post-operative patients. Medicines such as parenteral analgesics, IV fluids, and antibiotics are commonly used. There are inadequate data on monitoring of possible use or misuse of such medicines. There is lack of drug utilization studies in surgical indoor post-operative patients. Hence, the current study was conducted to assess the drug utilization patterns specially in post-operative patients in the inpatient ward of the Department of General Surgery - tertiary care hospital Jodhpur (Rajasthan). We collected data from 300 patients admitted in post-operative general surgical ward in a tertiary care teaching hospital over a period of one year. We analyzed the data by using WHO Prescribing indicators. Antimicrobials, IV Fluids and analgesics were most commonly prescribed, they were used in all study patients (100%). The average number of drugs per encounter was 7.40. The parenteral route of administration (89.08 %) was the most common route, followed by oral route (10.52%), inhalational route (0.39%) was the least commonly used route. Use of generic drugs was high (98.78%) and most of the drugs were prescribed from Essential medicines list 2019-20 of Rajasthan (97.64%). Which shows that the therapy was cost effective and there was successful implementation of EML in our Government hospital.

KEYWORDS: Drug utilization study, Post-operative Patients, Surgical ward, indoor Patients**.**

I. INTRODUCTION

Drug therapy is one of the main component for patient care management in health-care settings. There are many pharmaceutical products with many brand names available to prescribers and consumers at an unreasonable cost. Irrational and inappropriate use of drugs noticed in health-care system throughout the world, is a major concern. Hence, the foremost aim of drug utilization research is to facilitate rational use of drugs in the population.[1]

Drug utilization study is a structured process which is used to assess the quality of drug therapy by engaging in the evaluation of data on drug prescribing, dispensing, and patient use in a given health-care environment, against predetermined, agreed on criteria and standards, with special emphasis on the resulting medical, social, and economic consequences.[2]

The main aim of the drug utilization research is to facilitate the rational use of the drugs in population. Monitoring of prescription should be done periodically to increase the therapeutic efficacy, decrease adverse effects and provide feedback to the prescribers to ensure rational use of medicines, to make estimates of the number of patients exposed to drugs within a given time period, to describe the extent of drug used at a certain moment in a certain area, to estimate to what extent drugs are properly used, over-used or under-used, to decrease the pattern or profile of drug use, assessing which alternative drugs are being used for particular conditions and to what extent, and to compare observed patterns of the drug use with currently recommended guidelines for the treatment.[3] Most of the time drugs prescribed inappropriately. The development of drug utilization as a research area has made it possible to study drug usage in a scientific and formal manner.[4]

Multidrug therapy before, during, and after surgery is mostly used in indoor post-operative patients. Medicines such as parenteral analgesics, IV fluids, and antibiotics are commonly used. There are inadequate data on monitoring of possible use or misuse of such medicines. There is lack of drug utilization studies in surgical indoor post-operative patients. Hence, the current study was conducted to assess the drug utilization patterns specially in post-operative patients in the inpatient ward of the Department of General Surgery - tertiary care hospital Jodhpur (Rajasthan).

II. AIMS AND OBJECTIVES

The objective of the present study was to evaluate the prescribing pattern / utilization pattern of drugs among post-operative general surgical patients and analysis of these prescriptions using WHO (World Health Organization) prescription indicators, so that such information would help in improving the quality of care provided to the patients admitted in post-operative general surgical ward in a tertiary care teaching hospital.

III. MATERIALS AND METHODS

The study was an observational, prospective study which was done at Department of General Surgery in Mahatma Gandhi hospital, Dr. S. N. Medical College, Jodhpur, Rajasthan. This study was conducted over a period of one year, after approval of Institutional Ethics Committee. Data of patients matching inclusion criteria were recorded after getting informed consent. Data like name, age, sex, diagnosis, ongoing treatment were recorded from patient's case file. These data were recorded in previously prepared Case Record Form (CRF). Identity of patient was kept confidential.

After recording the obtained information in the case record form the data were analyzed as under.

1. Demographic profile of study patients.
2. Distribution according to classes of drugs prescribed.
3. Percentage wise distribution of analgesics.
4. Percentage of fixed dose combinations prescribed
5. Prescribing indicators like.

a) The average number of drugs per prescription.
b) The percentage of the drugs which were prescribed by their generic names.
c) The percentage of prescription with antibiotics prescribed.
d) The percentage of the drugs with injections prescribed.
e) The percentage of the drugs which were prescribed from the essential drugs list or the hospital formulary.

EPI-INFO version 7, which is a statistical software developed by Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia(US) was used for statistical analysis.

IV. RESULTS

A total of 300 patients of either sex and adult age group, who fulfilled inclusion criteria were included in this study, conducted in the Department of Pharmacology in association with Department of General Surgery at Mahatma Gandhi Hospital, attached with Dr. S.N. Medical College, a tertiary care teaching hospital, Jodhpur, Rajasthan.

1. DEMOGRAPHIC PROFILE

1a. **Gender (sex) wise distribution of study patients**:
Out of 300 patients 177 (59%) were male and 123 (41%) were female (Table 1).

Table 1: Gender (sex) distribution of study patients.

Sex	No. of Patients(n= 300)	Percentage
Male	177	59%
Female	123	41%

1b.Age wise distribution of study patients:
Out of 300 patients, maximum patients belonged to age group of 18 to 29 years, i.e. 128 (42.66 %), followed by age group 30-39 years- 57(19 %) and age group >59 years- 44 (14.66%). In this study, mean age of male patients was 38.58±16.44 years and female was found 35.90±15.20 years. Mean age of total patients was 37.48±15.97 years (Table 2).

Table 2: Age wise distribution of study patients.

Age (yrs)	Male		Female		Total
	N	%	N	%	
18-29	73	41.24	55	44.71	128
30-39	34	19.20	23	18.69	57
40-49	18	10.16	19	15.44	37
50-59	24	13.55	10	8.13	34
>59	28	15.81	16	13	44
Total	177	100	123	100	300
Mean±SD	38.58±16.44		35.90 ±15.20		37.48±15.97

2. DISTRIBUTION ACCORDING TO CLASSES OF DRUGS PRESCRIBED

Among the different classes of drugs used in the postoperative management of surgical patients, antimicrobials, IV Fluids and analgesics were most commonly prescribed, they were used in all study patients (100%) followed by gastrointestinal drugs which were used in 298 patients (99.33%), vitamins 66 patients (22%), drugs affecting blood & blood formation 40 patients (13.33%), respiratory drug 13 patients (4.66%), cardiovascular drugs 9 patients (3%), antidiabetic (Human insulin regular) 8 patients (2.66%) corticosteroids 5 patients (1.66%), diuretics 2 patients (0.66%), antianxiety drugs 2 patients (0.66%), cholinergic drugs, adrenergic drugs, antiadrenergic drugs and antiepileptic drugs were least prescribed 1 patients (0.33%). (Table 3).

Table 3: Distribution according to class of drugs prescribed.

Groups of drugs	Number of encounters	Percentage
Antimicrobials Drugs	300	100 %
IV Fluids	300	100 %
Analgesics	300	100 %
Gastroinstinal Drugs	298	99.33 %
Vitamin	66	22 %
Drugs Affecting Blood & Blood Formation	40	13.33 %
Respiratory drug	13	4.33 %
Cardiovascular drugs	9	3 %
Antidiabetics	8	2.66 %
Corticosteroids	5	1.66 %
Diuretics	2	0.66 %
Antianxiety drugs	2	0.66 %
Cholinergic drugs	1	0.33 %
Adrenergic drugs	1	0.33 %
Antiadrenergic drugs	1	0.33 %
Antiepileptic drugs	1	0.33 %

3. PERCENTAGE WISE DISTRIBUTION OF ANALGESICS

Among the different groups of analgesics used in postoperative period Inj. Diclofenac was used in maximum number of patients 234(78%) followed by Inj. Tramadol in 155(51.66%) patients (Figure 1).

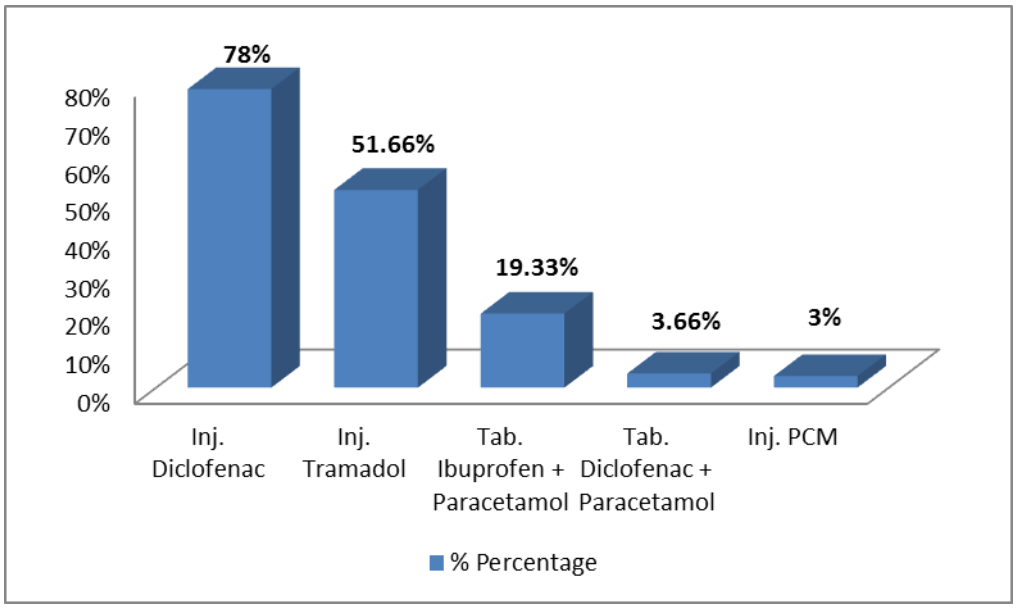

Figure 1: Percentage wise Distribution of Analgesics

4. PERCENTAGE OF FIXED DOSE COMBINATIONS PRESCRIBED

Out of total 3059 drugs, 382 (12.48%) were FDC's and 2677 (87.51%) were single drugs (Figure 2).

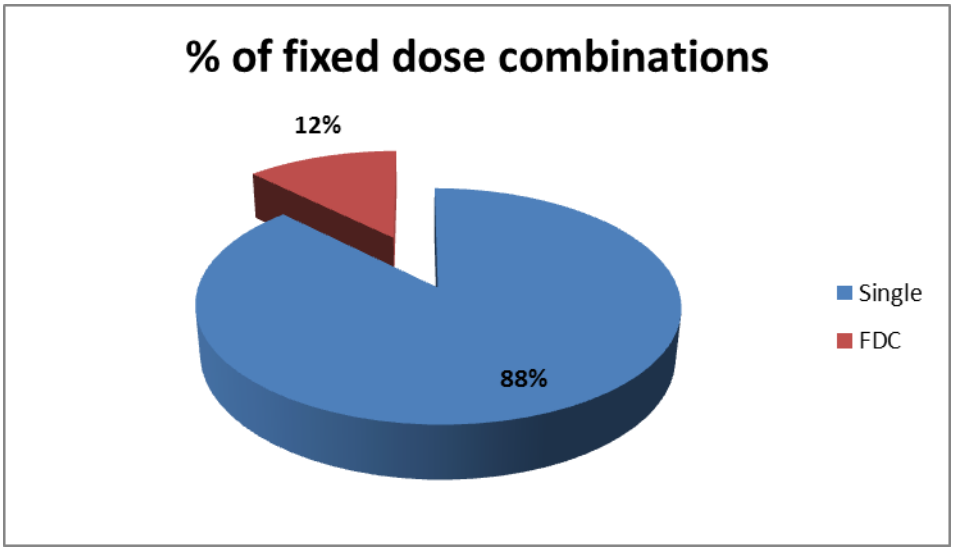

Figure 2: Percentage of fixed dose combinations prescribed.

5. PRESCRIBING INDICATORS

5a. AVERAGE NUMBER OF DRUGS PER ENCOUNTER

The total number of drugs per encounter ranges from a minimum of 4 drugs to 14 drugs. Majority of patients were prescribed 6 to 8 different drugs. The average number of drugs per encounter is 7.40 in this study (Figure 3).

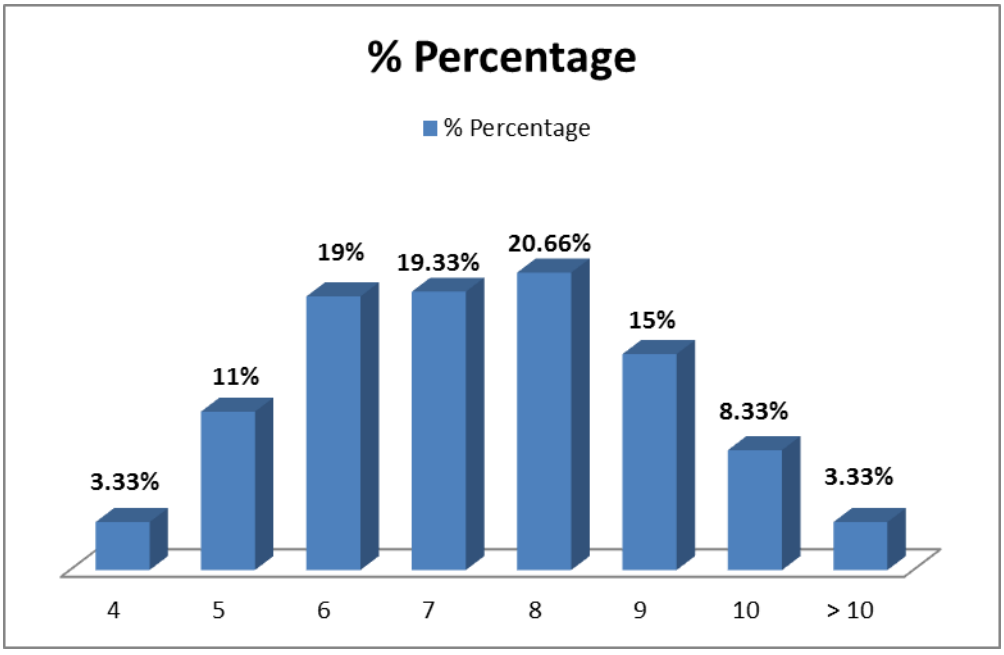

Figure 3: Total number of drugs per encounter.

5b. PERCENTAGE OF DRUGS PRESCRIBED BY GENERIC NAME

Out of total 3059 drugs, 3021(98.75%) were generic and only 38(1.24%) were branded (Figure 4).

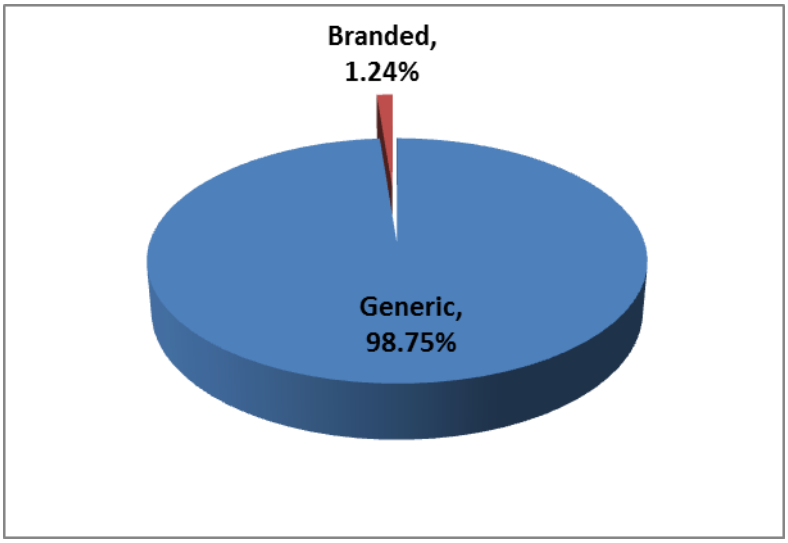

Figure 4: Percentage of drugs prescribed by generic name.

5c. PERCENTAGE WISE DISTRIBUTION OF ANTIBIOTICS

In this study among the different groups of antibiotic used in the postoperative management of surgical patients, Inj. Amikacin were maximum prescribed antibiotic, they were used in 273 patients (91%) followed by ceftriaxone which were used in 182 patients (60.66%), ciprofloxacin 171 patients (57%), metronidazol 165 patients (55%), pipracillin+tazobactum 78 patients (26%) and amoxy-clave 61 patients (20.33%) (Figure 5).

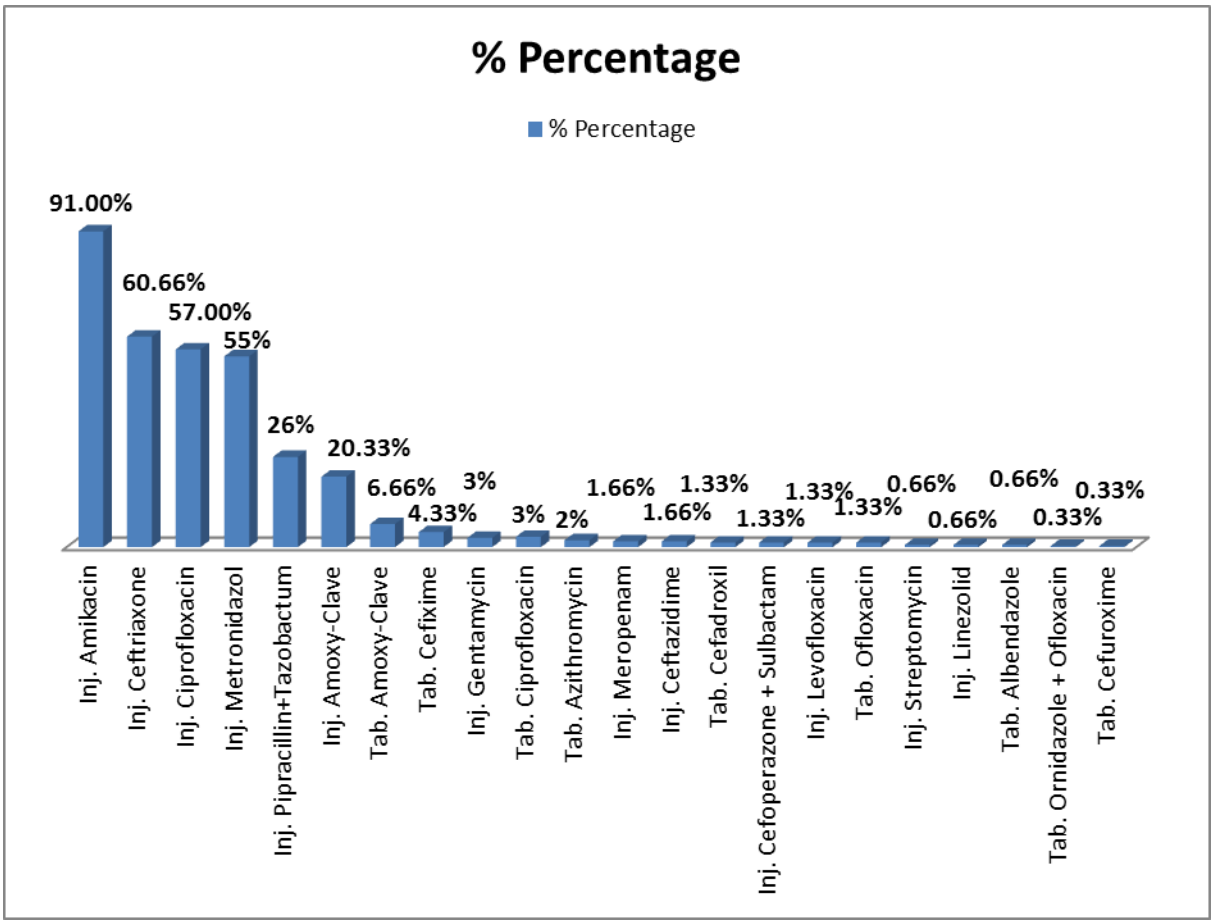

Figure 5: Percentage wise Distribution of Antibiotics.

5d. ROUTES OF DRUG ADMINISTRATION

The parenteral route of administration (89.08 %) was the most common route, followed by oral route (10.52%), inhalational route (0.39%) was the least commonly used route (Figure 6).

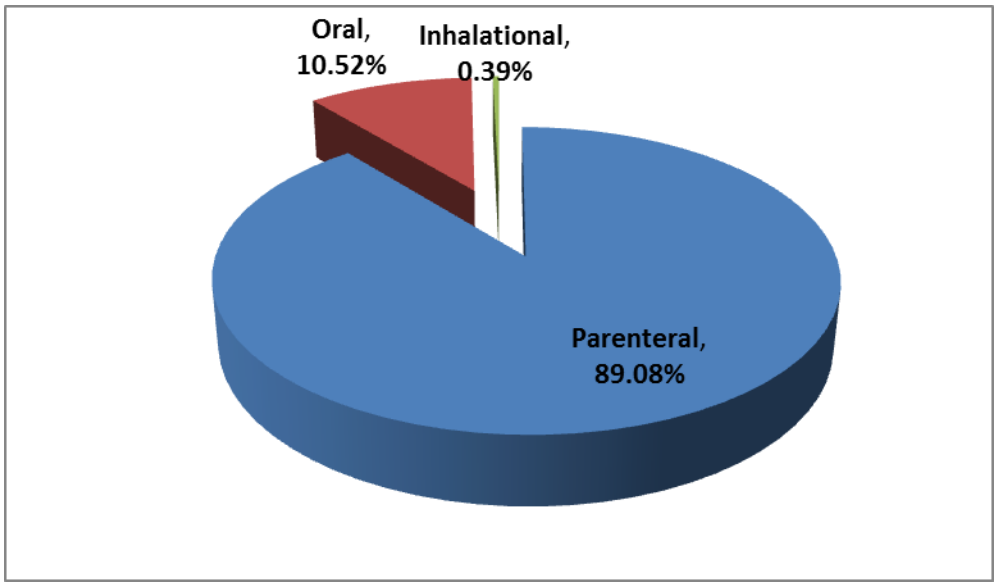

Figure 6: Routes of drug administration.

5e. PERCENTAGE OF THE DRUGS PRESCRIBED FROM ESSENTIAL DRUGS LIST OR FORMULARY

Out of total 3059 drugs, 2982(97.64%) drugs were prescribed from Essential medicines list 2019-20 of Rajasthan (Figure 7).

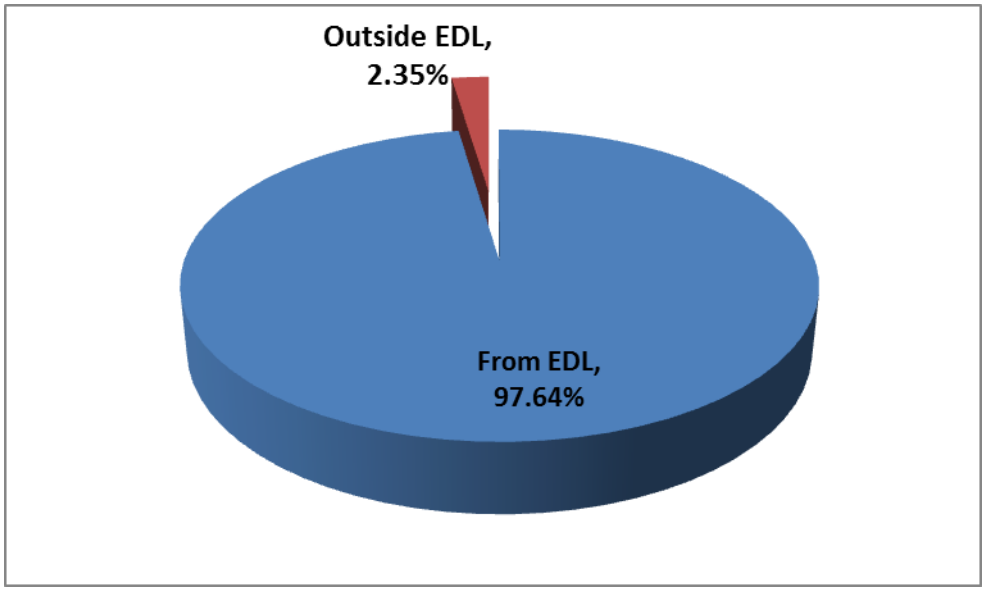

Figure 7: Percentage of the drugs prescribed from essential drugs list.

V. DISCUSSION

We collected data of 300 patients, matching inclusion criteria who underwent surgery and were admitted in postoperative ward, these patients were followed till discharge. Maximum proportion of patients were male 177(59%) which is similar to study done by Kumar et al (61.77%) and Alam et al (63.2%).[5],[6]

In this study 128 (42.66%) patients were in age group of 18 to 29 years. Which is similar to results reported by Patil et al where 62.96% patients were in age group of 18-30 years, whereas in study done by Arshad et al majority of patients were in age group 18-40 years. We found that most of the patients were < 50 years, similar results were reported by Pankaj et al. In contradiction to

this, Bhansali et al reported that 57.08% patients were of 40-60 years age group.[7],[8],[9],[10]

Most commonly prescribed classes of drugs were Antibiotics, IV fluids, Analgesics and GI drugs respectively. Among the individual drugs most commonly prescribed drug was pantoprazole (99.33 %) and ondensetron which was also prescribed in 99.33% patients.

Since most common complaint after surgery was post-operative pain, therefore analgesics were prescribed very frequently following surgery. The most commonly used analgesic in our study was diclofenac (78%). This is consistent with study done by Kumar R et al, where diclofenac was used in 80% patients.[5]

We found that 382 (11.53%) drugs were in the form of FDCs, which is similar to the study done by Kumar et al (12.42%), but higher than those found in study done by Arshad et al (1.08%).[5],[8]

The average number of drugs per encounter were 7.40. Majority of patients received 6 to 8 drugs with a range of 4 to 14. These were similar to study done by Siddhartha et al, Arshad et al and Sneha et al, who reported that average number of drugs used were 6.27, 7.04 and 8.93, respectively. Average drugs used in our study were higher in comparison to those reported by Kumar et al (4.26).[11],[8],[12],[5]

The overall percentage of drugs prescribed by generic name in present study were (98.73%) which were similar to study done by Sneha et al (98.51%), but higher than other studies such as Choudhary et al (41.6%) and Siddhartha et al (68.51%) respectively. The higher prescription rate of generic drugs helps to decrease the overall cost of treatment for patients.[12],[13],[11]

We found that all 300 patients (100%) received antibiotics, Which is similar to studies done by Bhansali et al (100%) and Kumar et al (100%). The purpose of antibiotics usage in all patients is to prevent postoperative infection at surgical site.[10],[5]

Most common antibiotics used in our study were amikacin (91%), ceftriaxone (60.66%), ciprofloxacin (57%), and metronidazole (55%). These findings are consistent with the findings of various studies conducted by Arshad et al, Sneha et al, Patil et al and Sharma et alrespectively. In all these studies antibiotics were also commonly prescribed.[8],[12],[7],[14]

The parenteral route of administration (89.08 %) was the most common route, followed by oral route (10.52%), inhalational route (0.39%) was the least commonly used route.

The overall percentage of drugs prescribed from Essential Drug List was 97.64%, which is similar to study done by Arshad et al (99.3%), but high when compared to other studies done across India such as Kumar et al (69.25%), Siddhartha et al (54.89%) and Sharma et al (52.96%).respectively.[8],[5],[11],[14]

This shows an effective and successful implementation of EML in the Government hospitals of Rajasthan, hence same is true for the treatment strategies carried out in our hospital.

VI. CONCLUSION

The present study was conducted in the Department of Pharmacology in association with the Department of General Surgery in Mahatma Gandhi hospital, Jodhpur (Rajasthan).

Our study gave us a general overview about the use of drugs in post-operative patients in surgical ward.

Most commonly used drugs were Antibiotics (100%), IV fluids (100%), Analgesics (100%) and GI drugs (99.33%).

Amikacin (91%), ceftriaxone (60.66%), ciprofloxacin (57%), and metronidazole (55%) were the most commonly used Antibiotics. Whereas pantoprazole (99.33 %) and diclofenac (78%) were the most commonly prescribed GI drugs and Analgesics, respectively.
Average number of drugs per prescription was 7.40 and average number of antibiotics per prescription was 3.64.

Use of generic drugs was high (98.78%) and most of the drugs were prescribed from EDL (97.64%). Which shows that the therapy was cost effective and there was successful implementation of EML in our Government hospital.

LIMITATIONS OF THE STUDY

1. Shorter duration of study
2. Study was done in single center only

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