

## **A Drug Utilization Study in the Indoor Ward of the Surgery Department of a Tertiary Care Hospital of Eastern India.**

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**Abstract:** *Pharmacotherapy with multiple agents before, during and after surgery is marked in present day indoor hospital setting. The main objective of drug utilization research being to assess the rationality of drug use, the present study intends to evaluate the drug utilization patterns using WHO/INRUD indicators in the inpatient ward of department of surgery in a teaching hospital of Eastern India ; and to assess how much it conforms to standard treatment guidelines. A descriptive, cross-sectional survey was conducted for 2 months in which 75 prescriptions were screened. In an average  $6.27 \pm 1.31$  (mean  $\pm$  SD) were prescribed per patient, with all of them receiving at least one injection and 78.67 % of the cases being given an antibiotic. Percentage of drugs prescribed by generic was a modest 68.51 % while only 54.89 % of all drugs were from WHO list for essential medicines. In this study we observed that the prescribing practices for antibiotic and injection deviates from the standard recommended by WHO. Widespread polypharmacy, lack of generic prescribing and very low incidence of prescribing medicines from essential drug list are other concerns that need to be addressed in order to conform to rational drug therapy.*

**Keywords:** *Drug utilization, Prescription audit, WHO/INRUD drug use indicators, Surgery, Prescribing patterns*

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### **I. Introduction**

Drug utilization research was defined by the World Health Organization in 1977 as “the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences”<sup>1,2</sup>

The main principle of the drug utilization research is to facilitate the rational use of the drugs in populations. For the individual patient, the rational use of a drug implies the prescription of a well-documented drug at an optimal dose. Monitoring of prescription and drug utilization patterns should be done periodically to increase the therapeutic efficacy, decrease the 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 use at a certain moment in a certain area, to estimate to what extent drugs are properly used, overused 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.<sup>3</sup>

All prescribing is not necessarily what patient needs and all patient needs are not necessarily met with drug therapy. Consequently, there is as much concern about inappropriate and expensive prescribing as about under-prescribing. The development of drug utilization as a research area made it possible to study drug prescribing and drug usage in a scientific and formal manner.<sup>4,5</sup>

The WHO stated that rational use of the 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 and at the lowest cost to them and community. The WHO core indications for drug utilization include: Average number of drugs prescribed by generic name, percentage of encounters with an injection and percentage of drugs prescribed from the essential drug list.<sup>3</sup> In contrast, irrational use of drugs refer to the distribution and consumption of drugs in way that reduce their efficacy or in situation where they are unlikely to have the desire effect. Irrational prescription of drugs leads to unproductive and risky treatment and poses a major risk in present day medical practice.<sup>6</sup>

Pharmacotherapy with multiple agents before, during and after surgery is marked in present day indoor hospital setting. While drugs like injectable analgesic and antibiotics are frequently used, there is limited data on

monitoring of possible use or misuse of medicines in this particular setting.<sup>7, 8, 9, 10</sup> Also there are few studies that have considered drug utilization pattern as a whole in surgical indoor wards.<sup>11, 12</sup>

Therefore, the present study was conducted to evaluate the drug utilization patterns in the inpatient ward of department of surgery in a teaching hospital of Eastern India.

## **II. Aims And Objectives**

The objective of the present study was to record the drug utilization patterns, analyze the drug use using WHO/INRUD (World Health Organization /International Network for Rational Use of Drugs) indicators and how much it conforms to standard treatment guidelines in indoor ward of surgical department of a tertiary care hospital.

## **III. Materials And Methods**

It was a cross sectional study which was done at the indoor ward of the surgery department, in a teaching hospital of Eastern India. The study was carried out for two months. Prior permission of the Head of Surgery department and clearance of the Institutional Ethics Committee was obtained for conducting the study. The Bed Head Tickets (BHT) of both male and female patients admitted in the General Surgery indoor ward during the study period were screened and collected. The name, age and sex of the patient were recorded. The numbers of drugs per BHT were observed.

The WHO prescribing indicators were used in this study, which included:

1. The average number of drugs prescribed per encounter: to measure the degree of number of different drug products prescribed by the number of encounters surveyed. Combinations of drugs prescribed for one health problem were counted as one.
2. Percentage of drugs prescribed by generic name: to measure the tendency of prescribing by generic name. It was calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100.
3. Percentage of encounters in which an antibiotic was prescribed: to measure the overall use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an antibiotic was prescribed by the total number of encounters surveyed, multiplied by 100.
4. Percentage of encounters with an injection prescribed: to measure the overall level use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an injection was prescribed by the total number of encounters surveyed, multiplied by 100.
5. Percentage of drugs prescribed from WHO Model List of Essential Medicines (EML): to measure the degree to which practices conform to rational therapy as well as standard treatment guidelines. Percentage is calculated by dividing number of products prescribed which are in essential drug list by the total number of drugs prescribed, multiplied by 100.

The percentage of the fixed dose combinations was also determined. The data collected from bed head tickets (BHT) was audited for the presence of name of the department, dose, frequency and duration of prescribing drugs, age and sex of the patients. The presence of the name and signature of the prescribing doctor was observed. The archiving of data and statistical analysis was done in the Department of Pharmacology, Calcutta National Medical College. GraphPad Prism version 5.0 software was used for all statistical analysis.

## **IV. Results And Observation**

A sample of 75 patient encounters was assessed in this descriptive cross-sectional study. Among them 22 patients were female while 53 are male. Male: female ratio was 2.41.

A total of 470 drug products were prescribed. Regarding the prescribing data, following answers were obtained (Table 1):

The average number of drugs per prescription or mean was 6.27 with a standard deviation (S.D) of 1.31.

The total number of drugs prescribed by generic name was 322 (68.51 %). (Figure 1).

As depicted in figure 2, an antibiotic was prescribed in 59 patient encounters (78.67 %).

In every one of the 75 encounters, one or more injections were prescribed (100 %).

Among all the drugs prescribed, 258 (54.89 %) were on the WHO Model List of Essential Medicines (EML). (Figure 3).

We also observed that there were a total 42 (8.94 %) fixed dose combinations prescribed out of all drugs.

Of a total of 470 drugs prescribed, 114 (24.26%) were antibiotics. The most commonly prescribed antibiotics were Gentamicin (12.28%), Ceftriaxone (10.53%), Piperacillin (9.65%), Metronidazole (8.77%), Amikacin (7.02%),

Levofloxacin (5.26%), Cefoperazone (3.51%), Amoxicillin (2.63%), Ampicillin (2.63%) and Cefuroxime (2.63%), as represented in Table 2.

A total of 250 injections were prescribed in the 75 encounters considered, which amounts to 53.19 % of the total number of drugs used. The most commonly prescribed injections were Diclofenac (11.6%), Ranitidine (11.6%), Ceftriaxone (4.8%), Diazepam(4.4%) , Ondansetron (4.4%), Piperacillin (4.4% ), Amikacin (3.2%), Pantoprazole (3.2% ) , Pentazocine (2.4%) and Tramadol (2%) . (Table 3).

All the screened prescriptions were compared to the Standard Treatment Guidelines (STG) for General Surgery issued by Ministry of Health & Family Welfare, Government of India <sup>13</sup>, with respect to drug therapy and 64 out of the 75 encounters i.e 85.33 % of the prescriptions conformed to the said STG.

## V. Discussion

In the present study, we found that on an average, all the patients received about 4 to 9 drugs. It is a well-established fact that polypharmacy in this scale is responsible for more adverse drug reactions, drug interactions and increased cost of therapy.

All the cases received at least one injection, which again contributed towards the escalating cost of treatment, patient morbidity and negatively influenced the WHO recommended prescribing indices.

There is also a significantly high rate of antibiotic use, about 78.67 % of all cases, with rampant use of valuable broad/extended spectrum agents like ceftriaxone, piperacillin etc., which may be unnecessary in many instances and often potentially dangerous.

While majority of the prescriptions were in conformity with national STG, only 68.51 % of all medicines were prescribed in generic name, which is far from ideal. Again only 54.89 % of all drugs were from the essential drug list, which clearly tends to deviate from rational drug therapy.

These findings from our study can be compared to an observation by Bhansali et al.<sup>14</sup> where majority of the patients in surgery department of a hospital in western India were prescribed about 4 to 9 drug per prescription and all patients were given antibiotics unnecessarily. Here also a very low proportion of the medicines were from the national essential drug list.

Similarly, Salman et al.<sup>15</sup> evaluated the drug prescribing patterns in surgical wards of a teaching hospital in north India and found it was not based on WHO criteria for rational use of drugs and not at all evidence-based.

All the aforementioned studies agree that for rational prescribing of drugs, there is a need of mass awareness amongst the medical fraternity about good prescribing habit by following five steps of WHO Program on Rational Use of Drugs (RUD), with emphasis on exclusive use of generic drugs, minimizing polypharmacy, encouraging maximum prescription from the essential drug list and limit the use of antibiotics.

## VI. Conclusion

Results from our study show that majority of prescriptions conform to the national standard treatment guidelines. However practice of poly pharmacy, especially use of prophylactic antibiotics is very high. The trend of prescribing branded drugs as well as low incidence of prescribing medicines from essential drug list are significant concerns that leaves scope for improvement in terms of prescribing practices.

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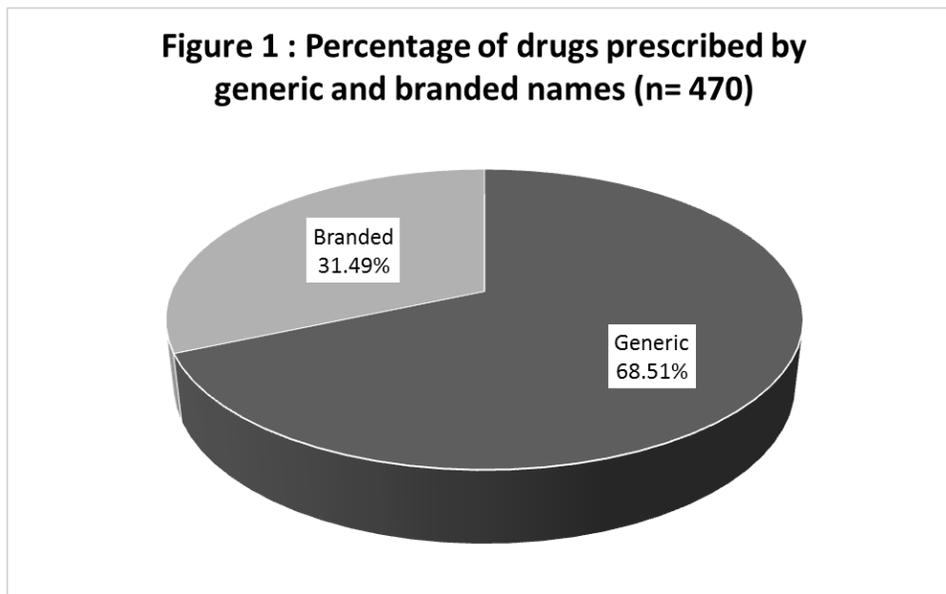
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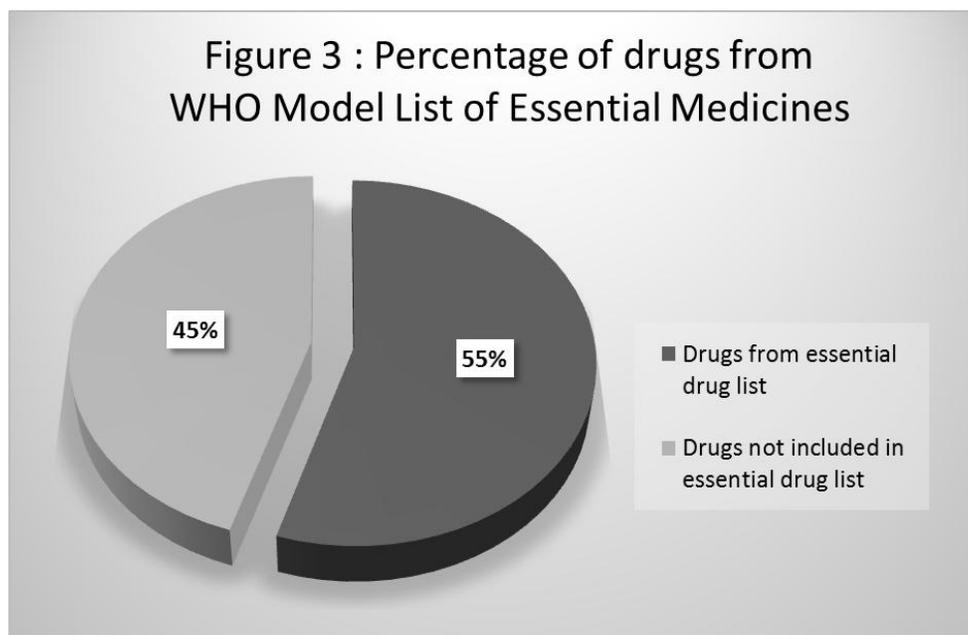
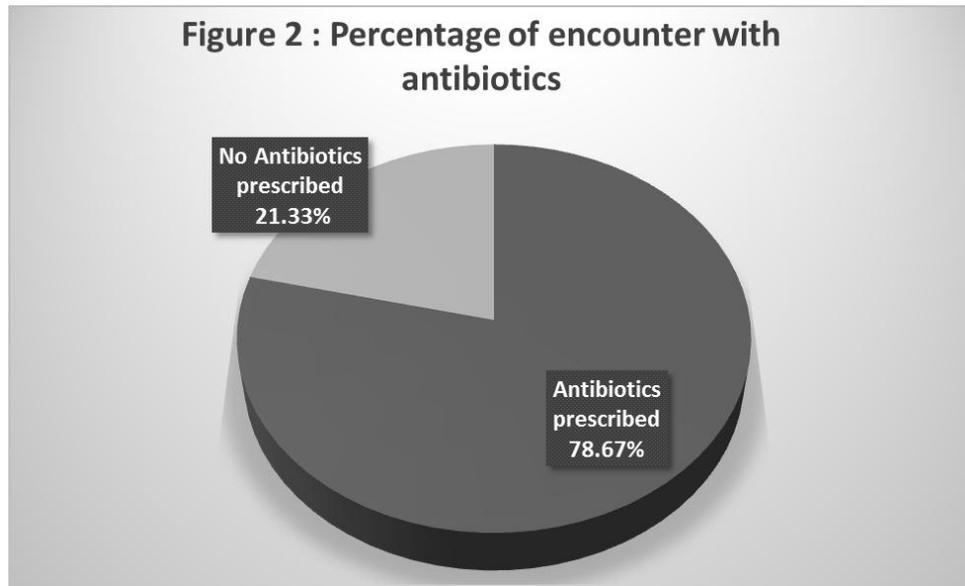
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**Table 1: Summary of results obtained in accordance with WHO prescribing indicators (n=75 encounters):**

Prescribing indicators assessed	Total drugs/ encounters	Mean ± SD / Percent
Average number of drugs per encounter	470	6.27 ± 1.31
Percentage of encounter with antibiotics	59	78.67 %
Percentage of encounters with injection	75	100 %
Percentage of drugs prescribed by generic	322	68.51 %
Percentage of drugs from essential drug list	258	54.89 %

**Figure 1 : Percentage of drugs prescribed by generic and branded names (n= 470)**





**Table 2: Most commonly prescribed antibiotics in the surgery indoor department (n=114)**

Most commonly prescribed antibiotics	Frequency	Percentage (%) out of all antibiotics prescribed
Gentamicin	14	12.28%
Ceftriaxone	12	10.53%
Piperacillin	11	9.65%
Metronidazole	10	8.77%
Amikacin	8	7.02%
Levofloxacin	6	5.26%
Cefoperazone	4	3.51%
Amoxicillin	3	2.63%
Ampicillin	3	2.63%
Cefuroxime	3	2.63%

**Table 3 : Most commonly prescribed injections in the surgery indoor department (n =250)**

Most commonly prescribed injections	Frequency	Percentage (%) out of all injections given
Diclofenac	29	11.6%
Ranitidine	29	11.6%
Ceftriaxone	12	4.8%
Diazepam	11	4.4%
Ondansetron	11	4.4%
Piperacillin	11	4.4%
Amikacin	08	3.2%
Pantoprazole	08	3.2%
Pentazocine	06	2.4%
Tramadol	05	2%