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DEVIATION IN WHO CORE PRESCRIBING INDICATORS AMONG SURGICAL PATIENTS IN SECONDARY CARE HOSPITAL: THE NEED FOR RATIONAL PRESCRIBING

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ABSTRACT: Irrational use of medicines is a major problem worldwide. In surgical patients, a greater number of drugs are prescribed So, evaluating prescribing patterns of various medications in surgical inpatients would enable identifying the presence of irrational use, thereby paving a way to rational prescribing. A prospective observational study was conducted in a secondary care hospital for six months. The general surgery, gynecology and orthopedic wards were included in the study. Descriptive statistics were used to assess drug utilization patterns and measure drug use indicators. A total of 97 patients admitted to the orthopedic, general surgery, and gynecology wards were enrolled in the study. The most commonly prescribed medications were Operation theatre (OT) medications, analgesics, Gastrointestinal tract(GIT) related medicines, antimicrobial agents (AMA), and their percentage use was 29.47%, 16.44%, 16.24%, 12.03%, respectively. Based on WHO core prescribing indicators, the average number of drugs per encounter was 15.4, the drugs prescribed from WHO-EML (World Health Organization- Essential Medicines List) were 29.87%, and the total number of prescriptions with injection was 95.8%. From this study, it was observed that prescription patterns highly deviated from the WHO core prescribing indicators, increasing the overall burden to the patient. Drug Utilization Evaluation (DUE) studies on large populations done in a secondary care setting can help to improve prescribing patterns and enhance the quality of care.

INTRODUCTION: Prescription pattern monitoring studies (PPMS) are drug utilization studies with the main spotlight on prescribing, dispensing, and administration of drugs and aims at promoting appropriate use of monitored drugs and reduction of abuse or misuse of monitored drugs. The main aim of DUE studies is to promote the rational use of drugs.

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If a drug is prescribed rationally, it will help reduce ADR (Adverse drug reaction), drug interactions, unwanted patient expense, and medical and paramedical staff burden [1, 2]. It is a coordinated effort by physicians and clinical pharmacists in providing the desired outcome to the patient [3].

Prescription Patterns explicate the extent and profile of drug use trends, quality of drugs and compliance with standard treatment guidelines, usage of drugs from essential medicine list, and generic drugs. In surgical patients due to surgery involved the most commonly used drug was OT medications, followed by the use of analgesics to reduce pain and antibiotics were given to prevent post-operative infection. AS per the WHO report,

nearly half of all medicines were prescribed, dispensed, or sold inappropriately, and that half of all patients fail to take them in the approved manner [3]. Assessment of the currently existing prescribing practice should be done before suggesting any change to be made with the aid of drug utilization studies [4]. There is escalating importance of PPMS because of a boost in marketing of novel drugs, variations in the pattern of prescribing and utilization of drugs, growing apprehension about delayed adverse effects, cost of drugs, and volume of prescription [16]. Currently, most of the studies on surgical patients focus on tertiary care settings; hence there is a need to assess the rationality of drug use in secondary care and primary care setting. The current study was done to appraise the drug use pattern of surgical inpatients of a secondary care hospital

Methods: A prospective, observational study was conducted for a period of six months (October - March) in a secondary care private hospital. The study included 97 inpatients undergoing surgery in the general surgery, orthopaedic and gynaecology wards. A data collection form was prepared, which included patient demographics, presenting complaints, past medical history, past medication history, presence of allergies, social status, family history and information on current treatment provided. Institutional Ethical Committee approval was obtained before the commencement of the study with the approval number of 019/IHEC/10/2019/NCP. The data was collected from the inpatient medical record and by interacting with the patients and/or caregivers, prescribers, and nurses. After collecting the data prescribing pattern of medications were analyzed using - WHO core prescribing indicators, the indicators of prescribing practices that measure the performance of health care providers in several key dimensions associated with the appropriate use of medicine. The indicators are as follows

- Average number of medicines per encounter.
- Percentage of medicine prescribed by generic name.
- Percentage of encounters with an antibiotic prescribed.
- Percentage of encounters with an injection prescribed.
- Percentage of medicine prescribed from essential drug list.

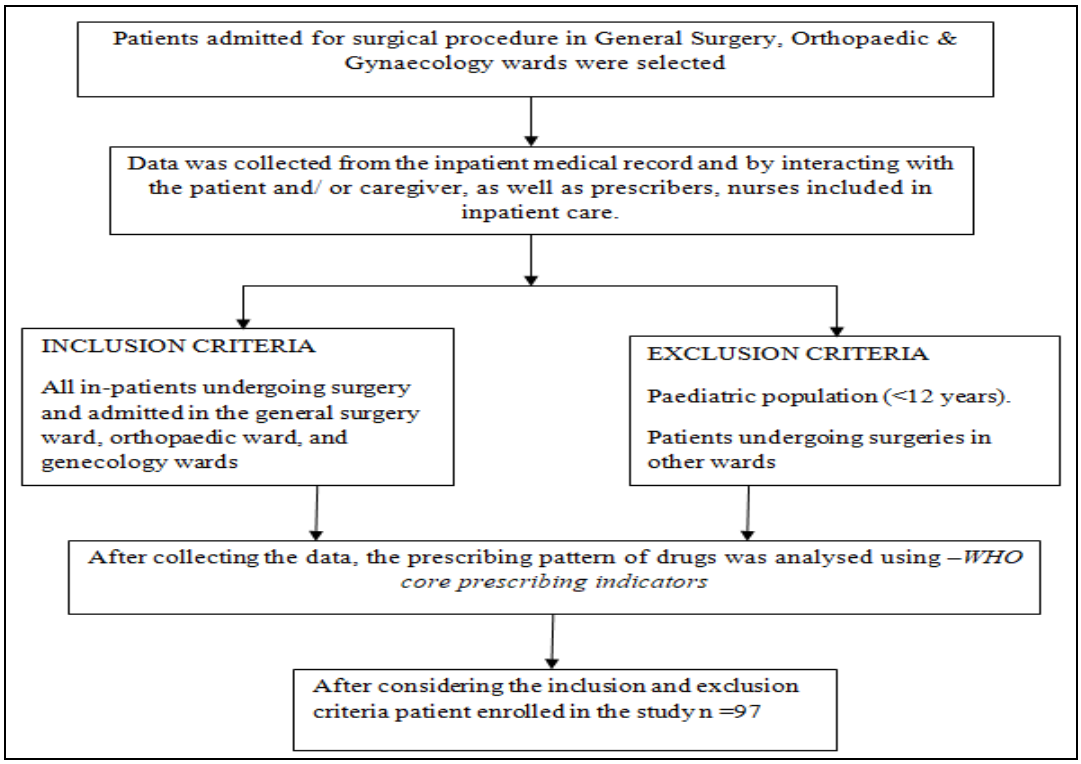

FIG. 1: STUDY DESIGN

RESULTS:

Baseline Characteristics:

TABLE 1: BASELINE CHARACTERISTICS OF THE ENROLLED PATIENTS

Variables	Number (n)	Percentage (%)
Gender		
Male	52	53.6
Female	45	46.4
AGE in years		
0-20	16	16.5
21-40	30	30.9
41-60	29	29.9
61-80	19	19.6
≥80	3	3.1
Department		
Orthopedic	48	49.5
General surgery	36	37.1
Gynecology	13	13.4
Length of Stay		
0-5	56	57.7
6-10	33	34
≥10	8	8.2
Co-morbidities		
NIL	59	60.8
1-2	31	31.9
≥3	7	7.2
WOUND CLASS		
Clean	57	58.8
Clean-contaminated	25	25.8
Contaminated	9	9.3
Dirty	6	6.2
Type of Surgery		
K wiring	21	21.6
ORIF	10	10.3
Hysterectomy	6	6.1
Appendectomy	5	5.1
Hemorrhoidectomy	4	4.1
Anal dilation	4	4.1
Laparotomy	3	3
Hernia repair	3	3
PFN	3	3
D&C	3	3
Implant removal	3	3
Others	32	32.9

A total of 97 patients were enrolled for the study. The average age was 44.03 years.

Majority of surgeries were from the orthopaedic ward.

The average duration of hospital stay was five days.

Most of the wounds were found to be from the clean wound category, which includes K wiring from the orthopaedic ward, appendectomy from the general surgery and hysterectomy from gynaecology. The prescription was collected and analyzed for the medication used in surgical patients. The most commonly prescribed medications were OT medications, analgesics, followed by GIT-related medications, followed by antimicrobials, then multivitamins and then, trace elements.

Among AMA, ceftriaxone + sulbactam (13.3%) was the most commonly prescribed, followed by Cefuroxime (12.2%) and amoxicillin + clavulanate (12.2%).

Prescribing Pattern:

TABLE 2: PRESCRIBING PATTERNS

Parameter	Total (N)	Percentage (Within the group)	Total Percentage
Total Drugs	**1496**		
OT Medications	**441**		**29.47%**
Lidocaine	52	11.7%	
Granisetron	48	10.8%	
Bupivacaine	44	9.9%	
Analgesics	**246**		**16.44%**
*OPIOID	65	26.4%	
Morphine	6	9.2%	
Pethidine	32	49.2%	
Tramadol	27	41.5%	
*NSAIDs	122	49.5%	
Aceclofenac	37	30.3%	
Diclofenac sodium	31	25.4%	
Diclofenac potassium	19	15.5%	
*OTHERS	59	23.9%	
Paracetamol	50	84.7%	
Flupiritine	9	15.2%	
Git Related	**243**		**16.24%**
*LAXATIVE	27	11.1%	
Biscodyl	10	37%	
Lactulose	7	25.9%	
*ANTIEMETICS	75	30.8%	
Ondansetron	37	49%	
Domperidone	37	49%	
*PPIs	120	49.3%	
Rabeprazole	79	65.8%	
Pantoprazole	40	33.3%	
*OTHERS	21	8.6%	
Metoclopramide	9	42.8%	
Simethicone	2	9%	
Probiotics	2	9%	
Antimicrobials (Ama)	**180**		**12.03%**
Ceftriaxone + sulbactam	24	13.3%	
Cefuroxime	22	12.2%	
Amoxicillin +clavulanate	22	12.2%	
Amikacin	18	10%	
Metronidazole	18	10%	
Ofloxacin	8	4%	
Meropenam	4	2.2%	
Nutritional Supplements/ Nutraceuticals	80		5.34%
Vitamins /multivitamin	34	42.5%	
Calcium	19	23.7%	
Iron	10	12.5%	
Parentral fluid	145		9.69%
CNS Related	27		1.80%
Respiratory	22		1.47%
Antidiabetic	29		1.93%
Antiplatelet	10		0.66%
Miscellaneous	73		4.87%

Who Core Prescribing Indicators:

TABLE 3: WHO CORE PRESCRIBING INDICATORS

Prescribing indicators assessed	Total drugs/encounters	Average/ Percent	Standard value
Average number of drugs per encounter	1496	15.4	1.6-1.8
Encounters with antibiotics	87	89.69%	20-26.8%
Encounters with injection	92	95.87%	13.4-24.1%
Drug prescribed from EML	447	29.87%	100%
Drug prescribed as generic	88	5.88%	100%

Table 3 shows WHO core prescribing indicators, where the average number of drugs per encounter was used to assess the extent of polypharmacy Percentage encounters with antibiotics that indicate the frequency of antibiotic prescribing in order to prevent resistance to antibiotic. Both these parameters showed values that were higher than the recommended. Encounters with injection were used to assess the frequency with which injectable medicines are prescribed to identify the cost burden and inappropriateness. Drug prescribed from EML was used to assess whether prescribing practices are appropriate with the drug use policy in the Essential Medicine List. EML is a list of medicines that satisfies the priority health care needs of the population. The percentage of drugs prescribed from EML and drugs prescribed as generic were low compared with the standard reference value. Percentage encounters with antibiotics and injectables were found to be high when compared to the recommended value.

DISCUSSION: The study showed variation in the percentage of types of medications prescribed from different wards, mainly due to variable patient profiles and indications. OT medications were the most commonly prescribed drugs in this study (29.47%). The most commonly prescribed OT medication was Lidocaine (11.7%) followed by granisetron (10.8%) and bupivacaine (9.9%). The total number of AMAs prescribed was 12.03% which was less than that revealed by Kumar R *et al.* (37.89%) and Shanker *et al.* 21.1% [5, 6].

In this study clean wound category was the most common type for which the commonest group of AMAs prescribed was Ceftriaxone + Sulbactam (13.3%) followed by Cefuroxime (12.2%), Amoxicillin + Clavulanate (12.2%), and Amikacin (10%). However, according to ASHP guidelines (The American Society of Health-System Pharmacists), the preferred antibiotic was cefazolin [12]. Patel KM *et al.*, in their study, observed that Amikacin and Metronidazole were the most commonly used antibiotics [7]. In a study by Khade *et al.*, Ciprofloxacin and Metronidazole were the two most frequently prescribed antibiotics [8]. GI-related drugs prescribed was 16.24%, which turned out to be less than that disclosed by Kumar R *et al.* 23.36% [5]. In this study, PPIs (Proton Pump Inhibitors) were given even without GI discomfort, and at inappropriate frequency of administration. The commonly prescribed PPIs were rabeprazole (65.8%) followed by pantoprazole (33.3%) while the commonest antiemetics prescribed were ondansetron and domperidone. The number of analgesics prescribed was (16.44%) which was less than that observed by Patel KM *et al. (17.11%* [7]. The commonly prescribed analgesics were paracetamol, followed by NSAIDs (49.5%), followed by opioids (26.4%).

The commonly prescribed NSAID was aceclofenac (30.3%), and that of the opioid was pethidine (49.2%). Overuse of analgesics was observed because the intensity of pain experienced varies from patient to patient and time to time. Based on patient complaints and prescriber experience, pain medication was given daily to improve patient quality of life. Apart from that, patients were observed to be taking their own medications without prescriber's knowledge.

Nutritional supplements and nutraceuticals prescribed were 5.34 %, which was less than as disclosed by Kumar R *et al,* (10% [5]. Total parenteral fluids prescribed were (9.6%). Other drugs include CNS related drugs (1.8%), respiratory drugs (1.4%), antidiabetic medications (1.9%), antiplatelets (0.6%) and miscellaneous drugs (4.8%). The average number of drugs per prescription was 15.4, and this value was found to be higher than the study done by Asha Pathak *et al.* (5.11) and Karki N *et al.* (2.6) [9, 13].

The value is much higher than the recommended limit, and it is demonstrative of a high degree of polypharmacy among surgical patients. However, most of the patients were less than 59 years of age and without many comorbidities. Drugs prescribed from WHO-EML were only 29.8% and still on the lower side as compared to standard value and study done by Niti Mittal *et al.* (78.4%) and by Binaya Shrestha *et al.* (47.6%) but higher than the study done by Asha Pathak *et al.* 23.04% [9, 10, 11].

This lower value was due to a lack of resources in this study as it was observed that prescribers were unaware of EML by the WHO that led to very few prescriptions being prescribed from the list. The percentage of encounters with injectable drugs was about 95.87%. The use of injectables was high

compared to the standard value and was higher than studies done by Binaya Shrestha *et al.* (71%) and (9%). [11, 15].

This study also observed that multiple injections, including multiple antibiotic injections, were given to the same patient for a longer duration than required before converting to an oral dosage form which led to increased cost burden to the patient.

The percentage of encounters with antibiotics was about 89.69%. The use of antibiotics was high when compared to a standard value, and was higher than the study done by Asha Pathak *et al.* (24.25%) and by Mishore K.M *et al.* [9, 14].

It was observed that antibiotics were used in surgeries mainly for prophylactic purposes. Increased use of antibiotics would lead high degree of resistance by bacterial strains [9].

Drugs prescribed by generic name were only 5.8%. This was very low compared to the standard value and lower than the study done by Asha Pathak *et al.* (89.88%) and by Niti Mittal *et al.* 21.50% [9, 10]. The low values of generic drug use show how prescribing habits are being directly influenced by the medical representatives of pharmaceutical companies [9]. Extensive use of drugs in brand names may impose an additional financial burden on patients.

CONCLUSION: It was observed that prescription patterns highly deviated from the WHO core prescribing indicators. The use of injectables and antibiotics was high as compared to the standard value. Increased number of injections results in an increased cost of therapy, patient morbidity and negatively influenced the WHO recommended prescribing indices. Drug prescribed by WHO-EML and the generic name was below the standard value. Hence, it is required to enhance the quality of prescription.

The use of multiple antibiotics should be avoided whenever possible, and they should be based on local antibiograms, which are yet to be implemented in the community. Drugs should be prescribed from the essential medicine list by their generic names based on the local guidelines and by considering their cost.

This may be achieved by updating the knowledge of health care professionals through academic detailing, DUE studies, seminars, and continuing medical education (CME) programs.

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