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DRUG PRESCRIBING PATTERN IN SURGICAL WARDS IN A TERTIARY HEALTH CARE TEACHING HOSPITAL

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ABSTRACT: Aim and Objective: evaluate the pattern of drug prescription in patients admitted in surgery wards of a tertiary care teaching hospital. **Materials and Method:** A prospective cross section observational study was conducted over a period of 6-months from January 2021 to June 2021 in surgical ward at tertiary care teaching hospital in Maharashtra. Patients above 18 years and receiving medical treatment pre- and post-surgery were included in the study. Data analyzed by using the WHO core prescription indicators. **Results:** 600 patients with surgical operations were included in the study. The mean duration of hospital stay is 10 days. The patients between the ages of 40-65 years constituted the higher number with a mean age of 50.81 years. There was male preponderance 58.17%. The major diagnostic condition were observed in the surgical ward was skin and soft tissue infections (35.17%) followed by Appendicitis (16.67%), Hernia (16.17%) and Diabetic foot ulcer (11.67%). The average number of drugs per prescription was 6.08. Antibiotics, analgesics, ranitidine and intravenous fluids accounted for majority of the drugs prescribed. Percentage of prescription in which an antibiotic and an injection prescribed was 100%. Percentage of drugs prescribed by generic name was 43.2%. Percentage of drugs prescribed from National List of Essential Medicines 2015 was (97.41%). **Conclusion:** Polypharmacy, overuse of antibiotics was common in practice. Polypharmacy should be avoided whenever possible. However, in our study drugs prescribing according to the national essential list which is very good positive practice.

INTRODUCTION: The World Health Organization (WHO) has delineated drug utilization research, defining it as the study of marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, economic, and social consequences [1]. The utilization of antibacterial and analgesic medications holds paramount importance within surgical practice.

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Surgical site infections pose a significant challenge to successful postoperative recovery, often exacerbating morbidity and, in severe cases, leading to fatalities. Hence, meticulous attention to the prescription and administration of medications throughout the perioperative continuum is imperative to mitigate risks and optimize patient outcomes [2].

Prescription patterns often employ methodologies to assess physicians' adherence to established treatment protocols and rational prescribing practices [3]. Irrational prescribing encompasses practices such as polypharmacy, the use of medically unnecessary or unsuitable medications unrelated to the disease, and a preference for costly

branded prescriptions over more budget-friendly generic options. Additionally, the excessive and inappropriate use of antimicrobials further compounds these concerns. Such improper drug utilization can result in heightened medical expenses, the proliferation of antimicrobial resistance, adverse drug reactions (ADRs), and patient mortality [4, 5]. Therefore, drug utilization studies are invaluable tools in evaluating healthcare programs. They provide critical insights into the efficacy and appropriateness of medication use, guiding efforts to enhance patient care while mitigating associated risks. The current study was conducted to analyze prescribing patterns among post-operative patients in the surgical ward of a tertiary care teaching hospital.

MATERIALS AND METHODS: In this study, 600 patients were selected based on predefined inclusion and exclusion criteria. All patients who underwent operative procedures were included and selected for this study based on their willingness to participate and provision of informed consent. Only drugs administered post- operatively were considered, excluding those already in use by patients prior to the procedure. Exclusions comprised pediatric, pregnant, and lactating women, as well as individuals who discontinued treatment or declined participation. These criteria were established to preserve the study's integrity and safeguard the reliability of its results. The study was conducted after receiving approval from the institutional ethics committee (Approval number: DVVPF's VIMS/IEC/C/2020/30 dated 10/11/2020). Informed consent was obtained from all patients by explaining the study to them in their language. Patient information such as name, age, gender, diagnosis, social history, current medication, and post-operative medication was extracted from patient case files and prescription orders. This data was collected and analyzed to determine the prescribing pattern in the hospital, using the WHO prescribing indicators.

WHO Prescribing Indicators are:

1. Average number of drugs per encounter.
2. Percentage of drugs prescribed by generic name.
3. Percentage of encounters with an antibiotic, antispasmodics, analgesics etc. Prescribed.
4. Percentage of encounters with an injection prescribed and.

Percentage of drugs prescribed from essential drugs list or formulary. The data was analyzed using MS Excel Office 2010, and the results were presented as mean ± standard deviation.

Results: In the present study, there were 600 patients. Among them, 58.17% were male cases and 41.83% were female cases. The mean age of patients admitted to the surgery ward is approximately 43.45 years.

TABLE 1: GENDER DISTRIBUTION OF THE SAMPLE POPULATION

Cases	Percentage	Number
Male	58.17%	349
Female	41.83%	251
Total	100%	600

TABLE 2: DISTRIBUTION OF CASES ACCORDING TO AGE GROUP

Age group	Percentage (100%)	Number of cases (600)
18-35 years	32	192
36-50 years	38	228
51-65 years	23	138
66-85 years	07	42

For most patients, the average duration of admission was approximately ten (10) days.

The common diagnostic conditions showed in **Table 3** as:

TABLE 3: DISTRIBUTION OF CASES ACCORDING TO THE DIAGNOSTIC PROFILE

Diagnostic profile	Percentage (%)	Number of patients
Skin and Soft Tissue Infections	35.17	211
Appendicitis	16.67	100

Hernia	16.17	97
Diabetic Foot Ulcer	11.67	70
Anal fissure and Hemorrhoids	7.83	47
Renal calculi,	4.67	28
Fistulainano	2.67	16
Cholelithiasis	2.50	15
Pancreatitis	1.50	09
Breast and colon surgery	1.17	07
Total	100	600

WHO Core Prescribing Indicators: The total numbers of drugs prescribed were 3650 and the average numbers of drugs per prescription were 6.08. The Percentage of drugs prescribed by generic name was 43.2% and 56.8% of drugs prescribed by brand name. The Number of drugs prescribed from NLEM 2015 was 3571 (97.41%). An injectable form of drugs prescribed in all the 600 patients as either an injectable antibacterial agent, or an injectable analgesic or intravenous fluid. Thus, the percentage of patients with an injection prescribed were 100% in our study. Results of WHO –Prescribing indicators showed in **Table 4.**

TABLE 4: WHO –PRESCRIBING INDICATORS

Prescribing indicators	Numbers & percentage
Total no of prescriptions encountered	600
Total no of Drugs prescribed	3650
Average no of Drugs per encounter	6.08
Percentage of drug prescribed by Generic name	43.2%
Number of drugs prescribed from NLEM-2015	97.41%
Percentage of encounters with an Antibiotics prescribed	99.5%
Percentage of prescription with Injectable	100

Antimicrobial drugs were the most commonly prescribed drugs in present study and Category wise distribution of drugs was showed in **Table 5** and **Graph 1**.

TABLE 5: CATEGORY WISE DISTRIBUTION OF DRUGS

Category of drugs	Number of drugs Prescribed	Percentage (%)
Antimicrobial drugs	1262	34.56
Drugs acting on gastrointestinal system	865	23.73
Analgesic, NSAIDS	681	18.62
Intravenous fluids, vitamins & minerals	527	14.47
Antidiabetics drugs	261	4.42
Others	153	4.20
Total	3650	100

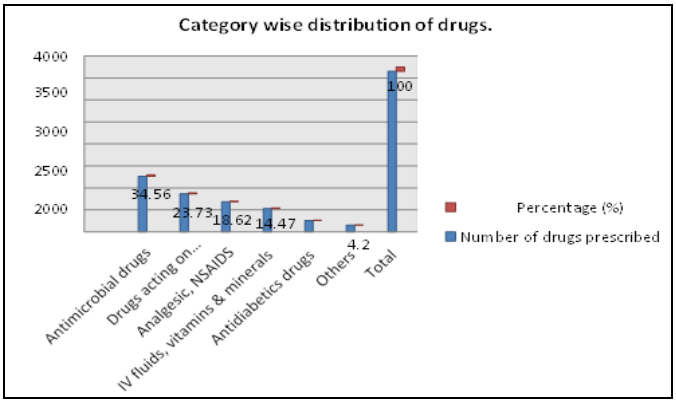

FIG. 1: CATEGORY WISE DISTRIBUTION OF DRUGS

DISCUSSION: The study was conducted to analyses the drug use pattern in post- operative patients admitted in the general surgery department at Tertiary care hospital. In our study, the case records of 600 patients were analyzed. Male subjects outnumbered female subjects, constituting 58.17% of the cases, while females accounted for 41.83%. This finding is consistent with studies conducted by Bhansali *et al.*, Ali *et al.*, and Samreen UA *et al.*, which concluded that 60%, 58.85%, and 79.25% of patients, respectively, were male [6-8]. The predominant age group among the patients is 36-50 years, with 228 cases, followed by the 18-35 years age group, which accounts for 192 cases. This indicates that individuals aged 36-50 years and 18-35 years are the most affected demographics within the patient population.

This trend is typical because individuals in the productive age group are actively engaged in various daily activities, making them more susceptible to diseases that may require surgical interventions. For most patients, the average duration of admission was approximately ten (10) days. The common diagnostic conditions observed in the surgical ward were skin and soft tissue infections (35.17%), followed by appendicitis (16.67%), hernia (16.17%), and diabetic foot ulcers (11.67%). A similar observation was made in a study conducted by Aiswarya *et al.,* where they found a similar pattern of diagnosed cases, including appendicitis at 23.04%, diabetic foot ulcers at 29.78%, and hernias at 21.27%. Some other studies in India also highlight the notable occurrence of appendicitis and hernias [9, 10].

Other conditions, such as Anal Fissure and Hemorrhoids and Renal Calculi, are present but represent a smaller fraction of the overall diagnoses. This distribution highlights the need for focused healthcare interventions for the most common conditions while also addressing less frequent issues. The total number of drugs prescribed for various disease conditions in the study population was 3650. The mean number of drugs per prescription was 6.08, indicating a practice of polypharmacy among the study population. Studies conducted in India have also noted instances of polypharmacy within their respective regions [6, 7].

Sometimes, managing certain conditions necessitates the use of multiple drugs, but our findings indicate that polypharmacy is prevalent in the region. Reasons for this phenomenon may include the pursuit of early relief from diseases. Of the prescribed drugs, 43.2% were prescribed using generic names. Prescribing antibiotics by their generic names allows for greater clarity and flexibility in choosing the most appropriate medication. It helps prevent confusion and ensures that the correct antibiotic is selected based on factors like effectiveness, cost, and availability [11, 12]. In our study, 97.41% of drugs were included in the WHO EML 2015. The concept of essential medicines is evidence-based, cost-effective, and highly practical in providing optimal drug therapy. Antimicrobial drugs were the most commonly prescribed, accounting for 32.56% of prescriptions, followed by gastrointestinal medications at 23.76% and analgesics and NSAIDs at 17.26%. Intravenous fluids, vitamins, and minerals 9 comprised 14.23% of the total prescriptions. Antidiabetic drugs were prescribed in 6.76%, with common medications including metformin, glimepiride, and insulin. Additionally, other drugs, which accounted for 5.43%, included cetirizine, deriphyllin, tetanus toxoid, bisacodyl, lignocaine, carbimazole, eltroxin, diazepam, furosemide, drotaverine, tamsulosin, and urodeoxycholic acid. Antimicrobials constituted the majority of prescribed medications, with a total 600 prescriptions.

The preferred drugs were primarily beta-lactam antibiotics, including third-generation cephalosporin's, which accounted for 32.56% of prescriptions, followed closely by penicillin's at 31.65%. Commonly utilized third generation cephalosporin's included the Cefperazone-Sulbactam combination and ceftriaxone, along with penicillin's such as Piperacillin-Tazobactam. Our findings align with those of Aiswarya *et al.,* highlighting the importance of these antibiotics in comprehensive infection management [13]. The second most commonly prescribed antibiotic medication was metronidazole, which accounted for 8.17%, targeting anaerobic infections. Following that, amikacin sulfate, an aminoglycoside, represented 7.33% and is effective against gram-negative bacteria.

Together, these antibiotics account for about 59.71% of all prescriptions, indicating a significant reliance on these medications. It is also important to note that the remaining 20.29% of prescriptions include other antibiotics critical in managing a range of infections. These include clindamycin for skin and soft tissue infections, vancomycin for serious gram-positive infections like MRSA, ciprofloxacin for urinary tract infections, azithromycin for respiratory infections, doxycycline for various bacterial infections, gentamicin for serious gram negative infections, and ampicillin for broad- spectrum coverage. Aceclofenac in combination with paracetamol was the primary choice among analgesics, administered *via* both oral and parenteral routes for managing postoperative pain, a common concern following surgeries.

Given the importance of effective pain management post-surgery, the use of analgesics has become nearly universal. This finding aligns with the research of Jitendra *et al.,* underscoring aceclofenac's widespread use and effectiveness in managing postoperative pain [14]. In our study, we found that injections were used for all postoperative patients (100%), supporting the findings of Agarwal *et al.* (88.13%), who reported that the widespread use of the parenteral route for administering antibiotics is common practice in many developing countries [15]. Consistent with this, the majority of antibiotics in our research were administered via the intravenous route. The number of prescriptions with fixed drug combinations was 253, accounting for 42.13% of the total 600 prescriptions. The most common one being prescribed was combination of antibiotics as prophylactic and treatment of infection followed by analgesic combination for pain relief.

CONCLUSION: This study provides foundational data for future research on prescribing patterns in a tertiary care unit. It shows strong adherence to the WHO-recommended essential drug list, reflecting a commitment to appropriate prescribing practices. However, concerns regarding polypharmacy and excessive use of prophylactic antibiotics were identified. To promote rational treatment, a standard antimicrobial stewardship program should be developed and implemented in surgical wards and the casualty department, enhancing antimicrobial use, patient safety, and overall treatment outcomes.

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Author's Contributions: Concept and design of the study, selection of the research method, data collection analysis of the data, interpretation of data, and writing of the first draft of manuscript was done by the main author. The co-authors had helped with the selection of the research topic, reviewed and provided the final approval for the version, which is going to be published.

Data Availability: The study was conducted in a tertiary care hospital within the region, a sufficient number of patients were available for inclusion in the research.

CONFLICT OF INTEREST: There are no conflicts of interest.

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