



# EVALUATING PRESCRIPTION PATTERNS IN SURGICAL WARD: A CROSS-SECTIONAL ANALYSIS OF A RESEARCH CONDUCTED AT A SINGLE MEDICAL CENTER

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## ABSTRACT

**Background:** Typically, surgical procedures require the administration of antibacterial and analgesic medications in order to be successfully carried out. Prescribing medication without a valid reason may result in serious consequences after surgery. **Materials and Methods:** This investigation was conducted retrospectively, using a random selection of 50 cases. Investigated case information to determine the trend in prescriptions. **Results:** The majority of the patients were between the age range of 21 to 50 years, accounting for 18 cases (36%). The most frequent reason for hospitalization was kidney stone. A total of 255 medication instances were administered, The intravenous route was the most commonly selected method, accounting for 174 medications or 68.2%. The category of medications known as antimicrobials was the most prevalent, accounting for 97 cases (38.0%). This was followed by analgesic/antipyretics, which accounted for 50 cases (19.6%). Ciprofloxacin was the most prevalent antibiotic, accounting for 22.7% of the cases. The dosage of 83 medications (32.6%) was deemed incorrect. **Conclusion:** Immediate measures such as the implementation of explicit instructions, SOP, guidelines, comprehensive training, and vigilant monitoring of drug usage are necessary to rectify certain erroneous attitudes.

**KEY WORDS-** Surgery, Antimicrobials, Antihistamines, NSAIDs, Ampicillin, Ciprofloxacin,

## INTRODUCTION

The utilization of antibacterial and analgesic medications is imperative for the successful execution of surgical procedures, since surgical site infections are a prevalent factor contributing to postoperative morbidity and death<sup>1</sup>. Improper prescription during surgical treatment of illnesses can result in serious consequences in both pre and postoperative care, perhaps leading to fatalities<sup>2</sup>.

Irrational prescribing include the practice of polypharmacy, the administration of medically inefficient and unsuitable medications that are not relevant to the disease, the utilization of costly medications, the preference for branded prescriptions over generic alternatives, and the excessive and improper use of antimicrobials<sup>3</sup>.

The prevalence of polypharmacy and the inclination towards expensive medications is not limited to underdeveloped nations, but is also observed in industrialized countries. The illogical utilization of medication leads to a higher occurrence of negative drug reactions, delayed alleviation, prolonged hospital

stays, increased illness and death rates, and financial losses. This is also a contributing factor to the growing resistance to antimicrobial drugs<sup>4</sup>.

The retrospective evaluation of drug prescription trends can be conducted by analyzing the clinical data of a certain region or institution<sup>5</sup>. Drug use studies, a method for evaluating healthcare systems, give statistics on the incidence of irrational medicine in certain regions<sup>6</sup>.

## Materials and Methods

The study was conducted at the Department of Surgery, K. J. Somaiya Medical College, Hospital And Research Centre in Mumbai, India, from July 19, 2010 to January 2011. This research was a retrospective analysis that comprised 50 patients from the Department of General Surgery. The case papers were obtained from the medical record division of the institute. Only the cases that required hospitalization were included, eliminating those who were treated as outpatients. From this group, a total of 50 cases were chosen at random for the research. The case sheets were thoroughly reviewed and data was collected

regarding gender disparities, average patient age, diagnoses, number of diseases, drug administration routes, types of drugs consumed, antimicrobial usage, prevalence of common and uncommon antimicrobials, utilization of single and multiple antimicrobials, culture and sensitivity testing, generic and branded drug usage, fixed-dose combinations, appropriateness of dosage, and frequency of drug and non-pharmacological interventions. The study received the requisite authorization from the institutional authorities. The data was analyzed with Microsoft Office Excel 2007, and the findings were presented in a descriptive manner.

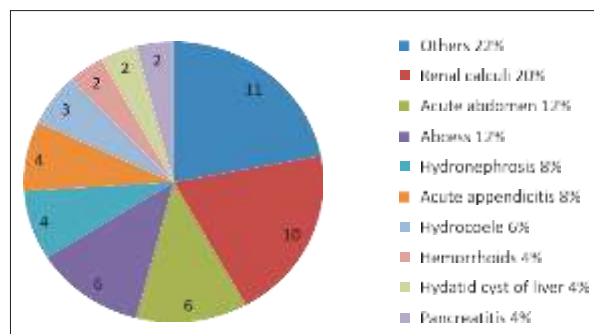
## RESULTS

Among the 50 cases, there were an equal number of girls and males, with 25 instances (50%) each. The majority of instances (18 cases, 36%) occurred in individuals aged between 21 and 40 years. This was followed by 7 cases (14%) in individuals aged 11 to 20 years, while the fewest number of cases (3 cases, 6%) were seen in individuals aged 60 years or older.

[Table 1].

**Table 1: Demographic characteristics of surgical patients in a rural hospital, including their age and gender distribution.**

Age group	Male (%)	Female (%)	Total (%)
Up to 10 years	01 (2)	04 (8)	05 (10)
11–20 years	03 (18)	04 (8)	07 (14)
21–30 years	05 (10)	04 (8)	09 (18)
31–40 years	04 (8)	05 (10)	09 (18)
41–50 years	07 (14)	05 (10)	12 (24)
51–60 years	02 (4)	03 (6)	05 (10)
>60 years	03 (6)	00 (0)	03 (6)
Total	25 (50)	25 (50)	50 (100)

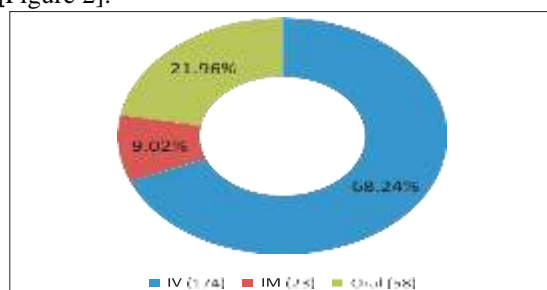


**Figure 1: Frequent Diagnosis (N = 50)**

The most frequent reason for hospitalization was Kidney stones, followed by acute abdomen and others of the disorders accounted for the remaining diagnoses, with each individual disease comprising less than 1% of the total [Figure 1]. Out of the total number of patients, 45 individuals (90%) were admitted to the hospital for a single ailment, while the remaining 5

patients (10%) had several diseases or complications related with their primary disease. [Figure 1]

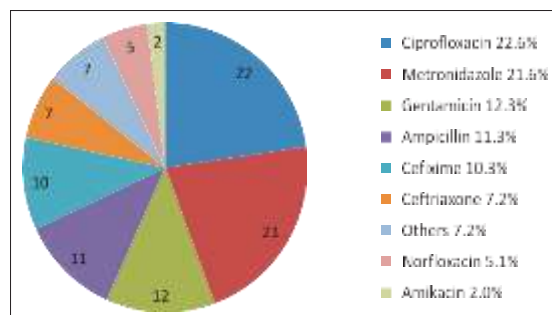
Based on the 50 instances, a total of 255 medications were prescribed, resulting in an average of 5.1 pills per prescription (with a median of 5). The intravenous route was the most often favored method of medication administration, accounting for 68.2% of the pharmaceuticals studied. This was followed by the oral route, which accounted for 21.9% of the drugs, and the intramuscular route, which accounted for 9.0% of the drugs. [Figure 2].



**Figure 2: Route of Drug Administration (n = 50)**

Antimicrobials accounted for the majority of prescription medications (97 or 38.0%), followed by non-steroidal anti-inflammatory medicines (NSAIDs) at 50 (19.6%). Within other medication categories, several groupings were employed, with each group accounting for less than 5% of the total pharmaceuticals, Ciprofloxacin was the most often utilized antimicrobial out of a total of 97, accounting for 22.7% of the usage. Metronidazole followed closely behind with a usage rate of 21.6%. On the other hand, amikacin was the least utilized antibiotic, with a usage rate of only 2.0%.

[Figure 3].



**Figure 3: Frequently Used Antimicrobials (n = 50)**

Among the total of 255 prescription medications, the majority (182, equivalent to 74.5%) were prescribed using their brand names. Empirical therapy was used to address all the cases. Out of the total pharmaceuticals, 83 (32.6%) had an incorrect dosage, while 26 (10.2%) had an incorrect frequency of administration. Two instances (4%) were administered a fixed-dose combination. Cold sponging, a non-pharmacological intervention, was employed in 1 out of 50 patients (2%). Out of the total patients, 20 (40%) were prescribed two separate antimicrobials, whereas 18 (36%) instances received just one antimicrobial medication



## DISCUSSION

The predominant age range in this sample was 21 to 50 years. This is a common pattern, since the age group that is actively engaged in socioeconomic activities, known as the productive age group, is more susceptible to disorders that may require surgical procedures<sup>7</sup>.

The hospitalizations primarily resulted from renal kidney stone, abscesses, and acute abdomen.

In the population under investigation, a significant prevalence of polypharmacy was discovered, with an average of 5.1 medicines per prescription. The majority of these prescriptions contained antimicrobials (38%), followed by NSAIDs (19.6%). Additionally, antihistamines were commonly prescribed, and the preferred mode of administration was intravenous. Both studies observed the occurrence of polypharmacy in their respective locations. Occasionally, certain illnesses need the use of a greater quantity of medications, however our research indicates that polypharmacy is often practiced in the region. Possible factors may encompass obtaining prompt alleviation from illnesses<sup>8-9</sup>.

The most favored antimicrobial agents were ciprofloxacin (22.65%), metronidazole (21.65%), third-generation cephalosporins, gentamicin, and ampicillin. The majority of medications were branded and administered without conducting culture and sensitivity testing. The utilization of two antimicrobial drugs was also prevalent. In their study done in Italian hospitals<sup>10</sup>, discovered that 18% of antimicrobial use involved the combination of penicillin with  $\beta$ -lactamase inhibitors. Additionally, the use of fluoroquinolones and third-generation cephalosporins was also prevalent. Additionally, they noted a greater utilization of antimicrobials in surgical units as opposed to medical units, as well as a higher prevalence of 3rd generation cephalosporins for surgical prophylaxis.

Antimicrobial coverage is important during surgical operations to prevent postoperative infective problems<sup>11</sup>. However, it is also commonly noted that antimicrobials are used unnecessarily. International recommendations recommend the use of 1st or 2nd generation cephalosporins for surgical prophylaxis, rather than 3rd and 4th generation cephalosporins or other stronger antimicrobials, which are also often used for this reason.<sup>12</sup> There are several factors contributing to this trend, including the motivation to prevent complications after surgery, the need for immediate relief, limited time for conducting investigations, inadequate infrastructure for microbiological laboratory testing, and the surgeon's personal beliefs and experience with various antimicrobial treatments<sup>13-14</sup>.

## CONCLUSION

It is necessary to review the prescription trend in the surgical department of the respective hospitals. The utilization of

elevated antimicrobials and proprietary medications is prevalent. Immediate action is required to fix unreasonable practices, including the implementation of particular SOP, guidelines protocols, training programs, and drug usage monitoring.

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## DECLARATIONS

**Financial Disclosure:** Nothing to declare.

**Conflicts of interest/Competing interests:** No competing interests for this work.

**Ethics approval:** Ethical clearance was obtained from the Ethics Committee For Research On Human Subjects (Ethics Committee/IRB at K. J. Somaiya Medical College, Hospital and Research Centre, Mumbai on 03 September 2010).

**Consent to participate:** Written informed consent was obtained from all participants.

**Consent for publication:** Not applicable.

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