(RESEARCH ARTICLE)

Prescribing Pattern of Antibiotics and Analgesics for Postoperative Patients in the Department of Orthopaedic: A Prospective Observational Study at a Tertiary Care Teaching Hospital, Mandya, Karnataka, India

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Abstract

Background: Postoperative care in orthopedic patients often involves the use of antibiotics and analgesics to prevent infections and manage pain. Rational prescribing in accordance with the world health organization(WHO) prescribing indicators is essential to ensure patient safety and optimal outcomes. Study on prescribing pattern of antibiotics and analgesics for postoperative patients in the department of orthopedics was conducted at MIMS Hospital, Mandya, Karnataka. AIM: To assess the prescribing patterns of analgesics and antibiotics and other supportive medications in postoperative orthopedic patients and assess compliance with WHO prescribing indicators.

Methodology: A prospective observational study was conducted in the department of orthopedics at a tertiary care teaching hospital in Mandya. A total of 300 postoperative patients were included using consecutive sampling method over predefined period. Data on demographic details, type of surgery, medications prescribed, duration of hospital stay and WHO prescribing indicators were collected and analyzed.

Result: Out of 300 patients, 206 were males (68.6%) and 94 were females (31.3%). The majority belonged to the 50–59 years age group. Self-fall (82.6%) was the leading cause of injury, with fractures (88.3%) being the predominant diagnosis. The most common surgeries were CRIF (36.6%) and ORIF (28%). The average hospital stay was 4.82 ± 0.96 days. A total of 1847 drugs were prescribed, of which analgesics (44.1%) were most frequent, followed by antibiotics (22.1%), supplements (18.0%), and gastroprotective agents (15.7%). WHO indicators revealed polypharmacy (average 6.15 drugs per prescription), 100% encounters with antibiotics and injections, 98% generic prescribing, and 51.3% use of essential medicines. Cephalosporins, particularly Cefixime (40.2%) and Ceftriaxone + Sulbactam (31.5%), were the most prescribed antibiotics. Analgesics were predominantly paracetamol (34%), aceclofenac + serratiopeptidase (32.6%), and tramadol (31.6%). Supplements were mainly calcium (24.3%) and B-complex vitamins (20.6%). DVT prophylaxis was given to 23.3% of patients, primarily with LMWH + aspirin.

Conclusion: Postoperative management in orthopedics relied heavily on analgesics and cephalosporins, with rational antibiotic use but excessive injection prescribing. Strengthening adherence to essential medicines and promoting oral formulations can improve rational drug use and cost-effectiveness.

Keywords: Postoperative Care; Orthopedic Patients; Antibiotics; Analgesics; Rational Prescribing; WHO Prescribing Indicators

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1. Introduction

According to the international society for the study of pain, pain is "an unpleasant sensory and emotional experience related to the actual or potential tissue damage or described in terms of such harm". Postoperative pain, often known as surgically caused pain, usually appears after surgery. May be Depending on the type and complexity of the surgery, the technique used by the medical staff, and the patient's tolerance, postoperative pain intensity can vary from person to person Prophylactic antibiotics are essential in orthopaedic surgery to prevent infections, which can severely impact bone and joint healing. Untreated infections may lead to poor recovery, implant failure, or the need for repeat surgery. Antibiotics must be started immediately—often in the emergency room—along with antitetanic prophylaxis. Treatment continues until surgical debridement is done, which removes dead and contaminated tissue. Post-debridement, further antibiotic use is tailored based on wound condition and local bacterial profiles. Surgical site infection (SSI) is one of the most serious complications in orthopaedic surgery. The incidence of SSI varies widely, ranging from 0.8% to 71%, depending on the type of procedure, patient-related risk factors, and hospital infection control practices. In implant surgeries, the risk is particularly high, with infection rates reported between 2% and 22%. Spine surgeries, in particular, have an average infection rate of around 9% The skeletal system gives the body its overall shape and structure. It supports soft tissues and provides attachment points for muscles. Bones protect delicate organs like the brain, heart, and lungs. Joints allow movement and flexibility in everyday activities. The skeletal and muscular systems work together to maintain posture and motion.

Bone marrow produces red blood cells, white blood cells, and platelets. Bones store important minerals such as calcium and phosphorus. Yellow bone marrow serves as a reserve for fat and energy. The skeleton constantly remodels itself to stay strong. Muscles allow movements by contracting and pulling on bones. Cartilage cushions joints and prevents bones from rubbing together. Ligaments connect bones to other bones and stabilize joints. Tendons attach muscles to bones, enabling movement. All parts of the musculoskeletal system work together for support, protection, and mobility.

2. Materials and Methods

A prospective observational study was conducted. Before the commencement of the study, approval from Institutional Ethical Committee for the research was obtained. All the post-operative patients of the orthopedics department of a teaching hospital Mandya Institute of Medical Sciences (MIMS), Mandya, during the study period of 6 months were chosen for the study. Sample size of 300 were in this study.

2.1. Study Criteria

2.1.1. Inclusion criteria

Postoperative in-patients in the department of orthopaedics.

2.1.2. Exclusion criteria

Patients with incomplete medical records or missing prescription details and who were discharged against medical advice were excluded from the study.

2.2. Methods Of Data Collections

All the data relevant to the patients were collected from patient's record. The patients record includes: socio-demographics details, diagnosis, surgical procedures, comorbidities, habits of the patients (smoker or alcoholic) and details of the drugs prescribed.

2.3. Analysis

Data collected will be coded and checked for completeness and uniformity, then data will be entered in MS Excel worksheet was used and the results were presented as tables, graphs or expressed as percentages according to the type of information collected. For continuous variables, mean and standard deviations will be calculated.

3. Results

Out of 300 patients, 206 were males (68.6%) and 94 were females (31.3%). The majority belonged to the 50–59 years age group. Self-fall (82.6%) was the leading cause of injury, with fractures (88.3%) being the predominant diagnosis. The most common surgeries were CRIF (36.6%) and ORIF (28%). The average hospital stay was 4.82 ± 0.96 days. A

total of 1847 drugs were prescribed, of which analgesics (44.1%) were most frequent, followed by antibiotics (22.1%), supplements (18.0%), and gastroprotective agents (15.7%). WHO indicators revealed polypharmacy (average 6.15 drugs per prescription), 100% encounters with antibiotics and injections, 98% generic prescribing, and 51.3% use of essential medicines. Cephalosporins, particularly Cefixime (40.2%) and Ceftriaxone + Sulbactam (31.5%), were the most prescribed antibiotics. Analgesics were predominantly paracetamol (34%), aceclofenac + serratiopeptidase (32.6%), and tramadol (31.6%). Supplements were mainly calcium (24.3%) and B-complex vitamins (20.6%). DVT prophylaxis was given to 23.3% of patients, primarily with LMWH + Aspirin.

Table 1 WHO Prescribing Indicators

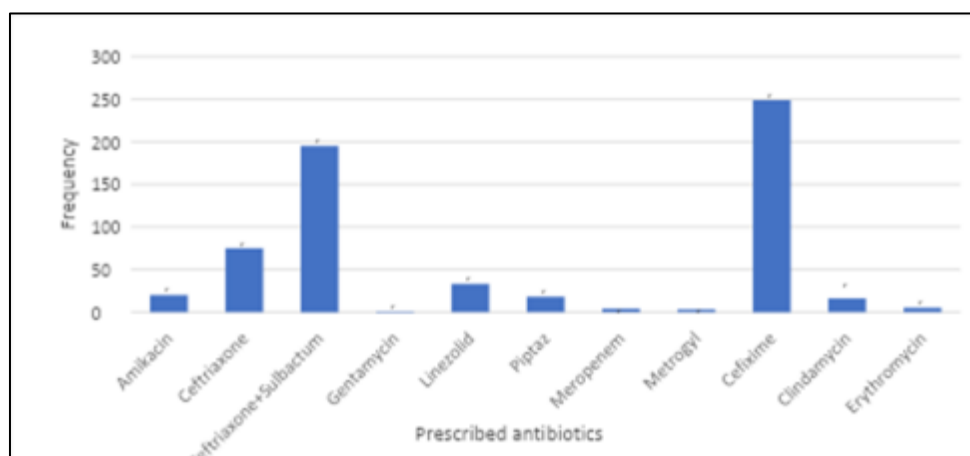| Indicators	Standard value	Observed value
Average number of drugs per prescription	1.6-1.8	6.15
Percentage of encounter of antibiotic	20-26.8%	100%
Percentage of encounter of injections	13.4-24.1%	100%
Percentage of Drug prescribed Generic Name	100%	98%
Percentage of drugs Prescribed from essential medicine list (EML)	100%	51.3%

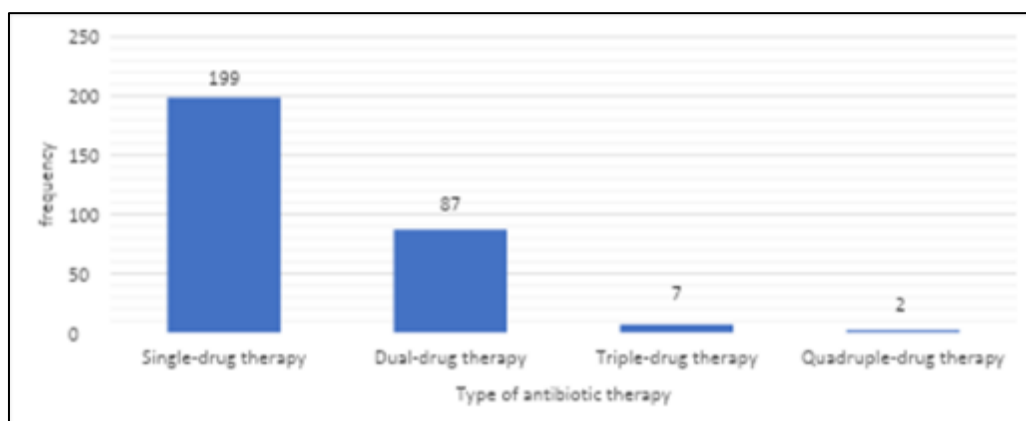**Figure 1** Frequency of Prescribed Antibiotics

Figure 2 Frequency of Different Antibiotics Therapy

Table 2 Different antibiotics Therapy

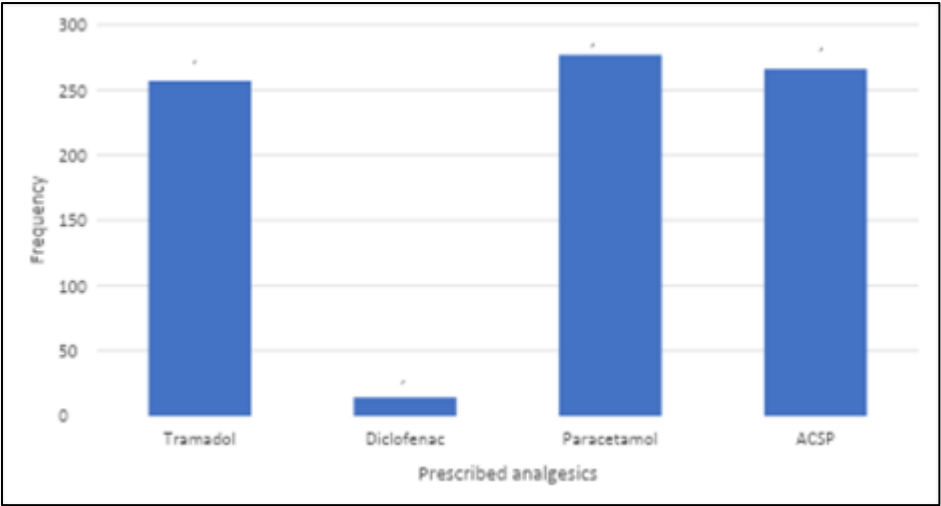| Type of Therapy	Antibiotics	No. of times prescribed	Percentage (%)
One -drug therapy	Inj. Ceftriaxone+ Sulbactam	125	42.37%
	Inj. Ceftriaxone	62	21.01%
	Inj. Piperacillin+ Tazobactam	5	1.6%
	Tab. Cefixime	3	1.01%
	Inj. Linezolid	3	1.01%
	Inj. Gentamycin	1	0.3%
Two -drug therapy	Inj. Ceftriaxone, Tab Cefixime	56	18.98%
	Inj. Linezolid, Tab. Clindamycin	5	1.6%
	Inj. Ceftriaxone, Inj. Amikacin	4	1.35%
	Inj. Piperacillin, Tazobactam	4	1.35%
	Inj. Ceftriaxone+ Sulbactam, Inj. Amikacin	3	1.01%
	Inj. Piperacillin+ Tazobactam, Inj. Meropenem	2	0.67%
	Tab. Cefixime, Inj. Ceftriaxone	2	0.67%
	Inj. Ceftriaxone+ sulbactam, Tab. Erythromycin	2	0.67%
	Inj. Ceftriaxone+ Sulbactam, Inj. Piperacillin+ Tazobactam	2	0.67%
	Inj. Ceftriaxone+ Sulbactam, Inj. Linezolid	2	0.67%
	Inj. Amikacin, Inj. Meropenem	1	0.3%
	Inj. Linezolid, Inj. Amikacin	1	0.3%
	Inj. Piperacillin+ Tazobactam, Inj. Amikacin	1	0.3%
	Inj. Ceftriaxone, Inj. Linezolid	1	0.3%
	Inj. Ceftriaxone+ Sulbactam, Tab. Clindamycin	1	0.3%
Three-drug therapy	Inj. Meropenem, Inj. Amikacin, Tab. Cefixime	1	0.3%
	Inj. Ceftriaxone, Inj. Amikacin, Inj. Linezolid	1	0.3%
	Inj. Ceftriaxone, Inj. Amikacin, Inj. Meropenem	1	0.3%
	Inj. Piperacillin+ Tazobactam, Inj. Linezolid, Tab. Clindamycin	1	0.3%
	Inj. Linezolid, Tab. Clindamycin, Tab. Ceftriaxone	1	0.3%
	Inj. Ceftriaxone+ Sulbactam, Inj. Amikacin, Inj. Meropenem	3	1.01%
Four-drug therapy	Inj. Ceftriaxone, Inj. Piperacillin+ Tazobactam, Inj. Amikacin, Inj. Meropenem	2	0.67%

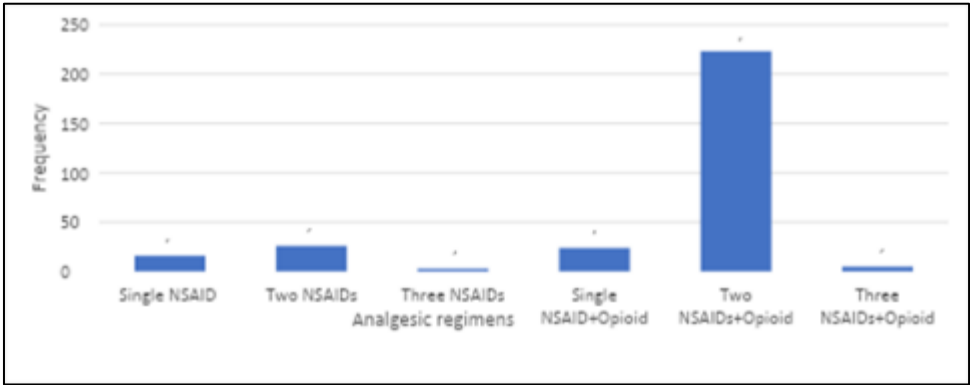**Figure 3** Frequency of Total Analgesics Prescribed

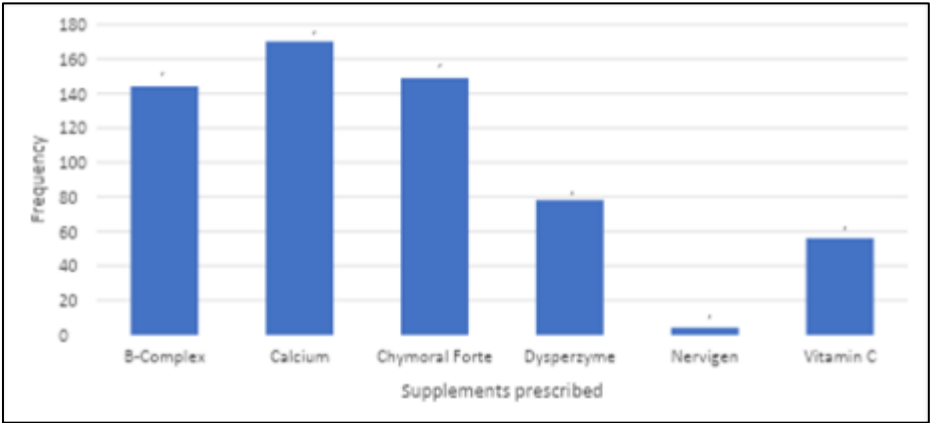**Figure 4** Frequency of Different Analgesic Regimens

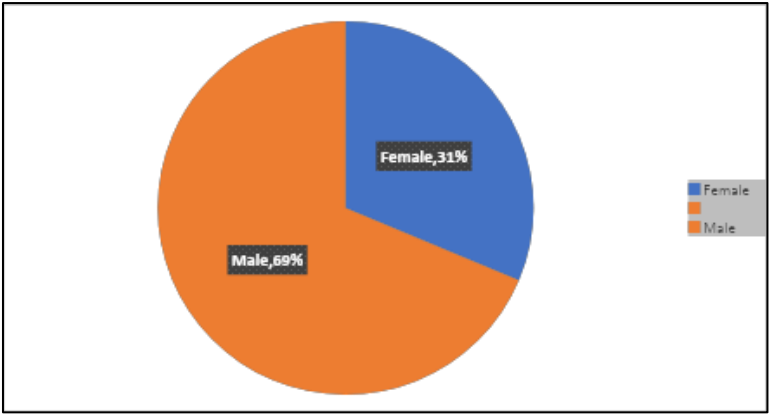**Figure 5** Different Supplements Prescribed in Study Population
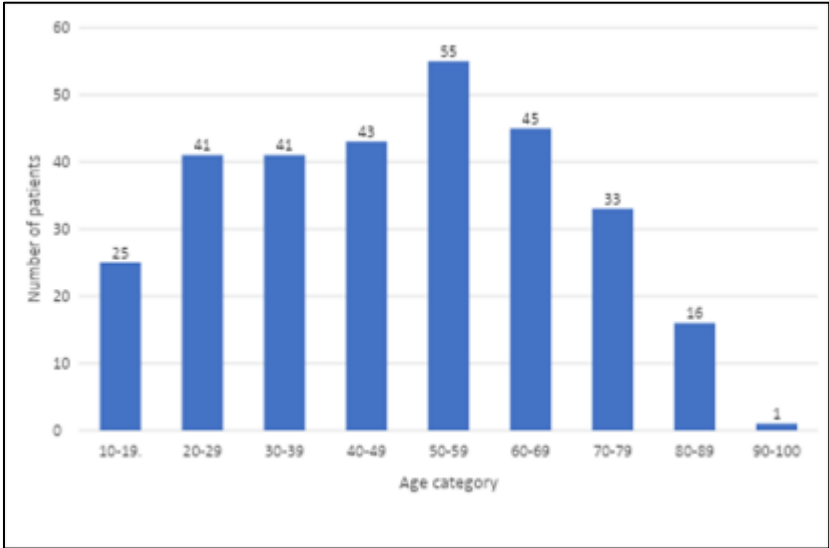
Figure 6 Pie chart showing gender distribution
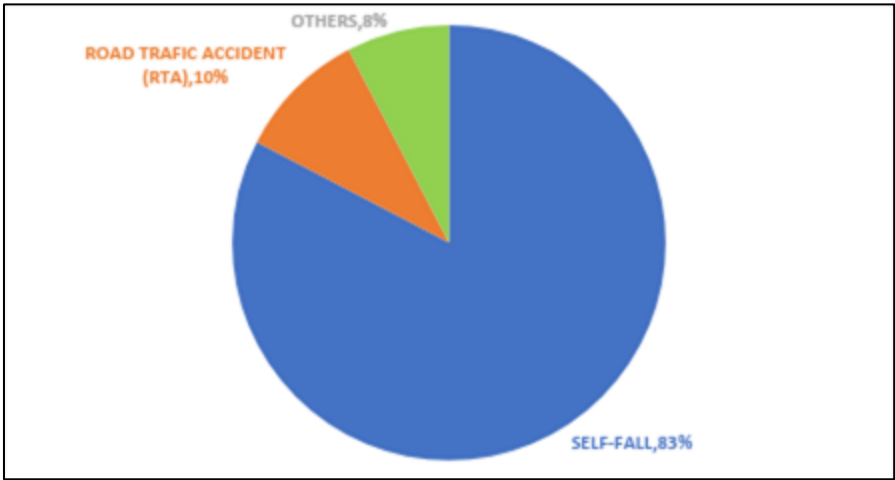

Figure 7 Bar graph showing age distribution
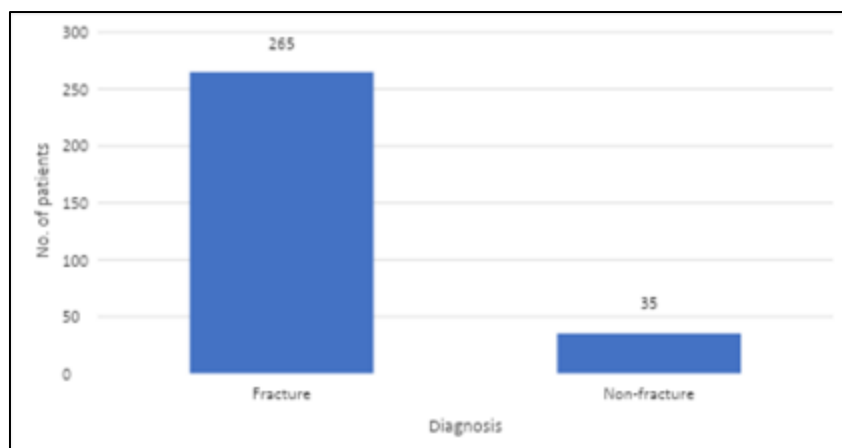

Figure 8 Cause of injury

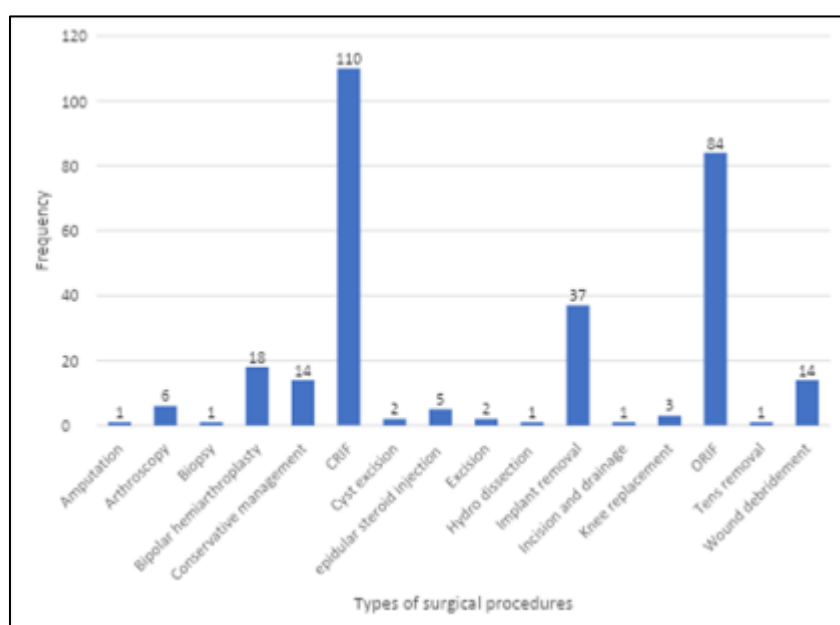**Figure 9** Fracture and non-fracture diagnoses distribution

Figure 10 Frequency of different types of surgical procedures

4. Discussion

A Prospective observational study was conducted to study the Prescribing Pattern of Antibiotics and Analgesics for Postoperative Patients in the Department of Orthopedics Patients in a Tertiary Care Teaching Hospital, MIMS. A total of 300 prescriptions were taken based on the study criteria were included in the study. The patient details were recorded in suitably designed patient profile form.

This study shows a clear male predominance among orthopedic inpatients, consistent with higher male exposure to outdoor and work-related injuries. Most patients were aged 50–59 years, and self-fall was the leading cause, reflecting age-related vulnerability and need for fall-prevention strategies. Fractures were the dominant diagnosis, and CRIF/ORIF were the most common surgeries, indicating the severity of injuries encountered. The average hospital stay of 4.82 days suggests efficient perioperative care.

Analgesics formed the largest drug category, highlighting the central role of pain management, while cephalosporins were the most frequently used antibiotics. However, the 100% antibiotic encounter rate raises concerns about possible overuse and the need for antimicrobial stewardship. Polypharmacy was prominent, with a mean of 6.15 drugs per prescription, increasing the potential for drug-related complications.

High generic prescribing (98%) demonstrates adherence to rational drug-use principles, though limited reliance on essential medicines (51.3%) indicates room for improvement. Supplements and gastroprotective agents were widely used, reflecting standard postoperative protocols. DVT prophylaxis was given to only 23.3% of patients, suggesting a need to reassess preventive strategies in high-risk orthopedic populations. Overall, the findings emphasize both strengths and gaps in current prescribing patterns and highlight opportunities to enhance rational medication use.

Compliance with ethical standards

Acknowledgments

The assistance from the Mandya Institute of Medical Sciences, Mandya is gratefully acknowledged.

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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