

**DRUG UTILIZATION OF ANALGESICS IN POST-OPERATIVE ORTHOPAEDIC
INPATIENTS IN TERTIARY CARE HOSPITAL, BELAGAVI: A PROSPECTIVE
OBSERVATIONAL STUDY**¹Dr. Srinivasa B. and ²Dr. Aruna Bhushan¹Post Graduate Student, Department of Pharmacology, BIMS, Belagavi.²Associate Professor, Department of Pharmacology, BIMS, Belagavi.***Corresponding Author: Dr. Aruna Bhushan**

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ABSTRACT

Objectives: To evaluate the prescribing pattern of analgesics and to analyze the rational use of analgesics in orthopaedic post operative in-patient. **Methods:** A prospective observational study was conducted from April to June 2019 in orthopaedic post operative in-patient department of tertiary care teaching hospital, BIMS, Belagavi. Prior permission from institutional ethical committee was taken. Detailed data of the inpatients including demographic, diagnosis, treatment and drug details was collected and entered in a proforma and expressed statistically. The prescribed drugs was assessed using National Model List of Essential Medicines(NLEM) 2015. The rationality of prescriptions was determined using the WHO indicators of drug utilization. **Results:** Out of 300 orthopaedic post operative in-patients, 192(64%) were males and 108(36%) were females. Patients of age group ≥ 51 years were more prone for fractures. The common indication for operative procedures was road traffic accidents inflicted fractures. The average number of drugs per prescription was 6.28. The average no of analgesics per prescription was 1.13. In this study, 87.3% of patients had received single analgesic and tramadol (58.3%) was commonly prescribed drug. Majority of patients received parenteral preparation (86.6%). Antibiotics (32.7%) were most frequently prescribed concomitant drugs. All 338 analgesics used were from NLEM and 245(72.5%) analgesics were prescribed by generic name. **Conclusions:** Tramadol was the commonly prescribed analgesic. Most of the analgesics prescribed were rationally from NLEM and by generic name.

KEYWORDS: Drug utilization, analgesics, orthopaedics, postoperative inpatients.**INTRODUCTION**

Acute pain defined as a normal and time limited response to trauma or other noxious procedures including pain related to medical procedures and medical conditions.^[1] Post- surgical pain is a common complication, it is initially of acute nature and may be nociceptive, inflammatory or neuropathic in nature. Pain is not just an unpleasant sensation but acute pain if poorly treated, may progress to chronic pain leading to prolonged rehabilitation and recovery.^[2]

Periodic evaluation of drug utilization patterns needs to be done to enable suitable modifications in the prescribing behaviour of medical practioners to make medical care rational and cost effective.^[3] Rational use of medicines (RUM) is an issue that has global importance, as it aims at evaluating the accessibility, availability and correct prescribing of drugs.^[4]

In developing countries like india, where financial resources are scarce and affordability of the patients is less, implementation of RUM becomes more important

and therefore, the assessment of drug utilization is vital for clinical, economic and educational purposes.^[5] Drug utilization studies conducted in the in-patient settings are effective tools that help in evaluating drug prescribing trends efficiency and cost effectiveness of hospital formularies.^[6] In our hospital, opioid analgesics frequently used to alleviate acute pain in operative patients. Hence, our aim of our study was to evaluate the pattern of drug utilization of analgesics in postoperative cases of orthopaedic and to analyze its rational use.

METHODS

This prospective observational study was conducted in orthopaedic department of tertiary care teaching hospital, Belagavi institute of medical sciences, Belagavi. The study was conducted after obtaining the approval from the institutional ethical committee.

Duration of study period was 3months from April 2019 to June 2019. The patients involved in our study were explained about the purpose of this study and prior consent was taken to go through their case sheets. The

data of the patients who fulfilled the eligibility criteria was taken. The inclusion criteria were: i) Post operative patients who received analgesics and stayed atleast 1 day to till discharge during study period ii) Patients irrespective of age, sex, diagnosis and treatment. Exclusion criteria: i) Patients attending orthopaedic OPD and those who were admitted in other wards with other diseases ii) Patients who were absconded or discharged against medical advice iii) Patients with cognitive impairment, critically ill or intubated.

The detailed data regarding demographic details, medication chart, operative procedure and duration of medication were recorded in predesigned case record forms. The data collected was entered into the MS excel

to study pattern of the drug use. NLEM 2015 and WHO indicators of drug utilization were used to assess the rationality of analgesics used. Statistical analysis was done by using descriptive statistics like percentage.

RESULTS

Total number of the orthopaedic inpatients included in our study was 300, of which males were 192 (64%) and females were 108 (34%), Proportion of male to female was 1.77: 1.0. Majority of patients were of the age group between 20-40yrs (29%) and 40-60yrs (30%) as shown in "Fig 1". Regarding the duration of stay of post operative cases in hospital 237 (79%) patients stayed for 1-3days and 63 (21%) stayed for 4-6days.

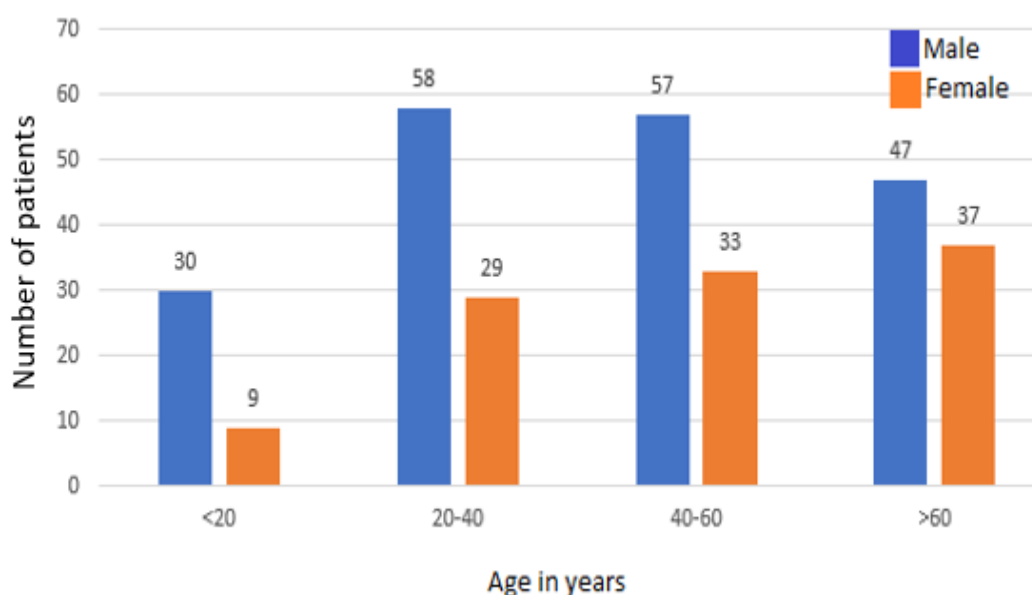


Figure 1: Demographic characteristics of patients.

Table 1 shows total number of different orthopaedic cases indicated for operative procedures and subsequent analgesics use. Most common diagnosis for orthopaedic

operative procedures were road traffic accidents inflicted fractures (51.6%) and self fall inflicted fractures (39.6%).

Table 1: Different types of diagnosis indicated for surgery.

| Post operative cases | Total No. of patients | Percentage |
|--------------------------------------|-----------------------|------------|
| Fractures | 274 | 91.2% |
| Self fall inflicted fractures | 119 | 39.6% |
| Road traffic accidents | 155 | 51.6% |
| Infective arthritis / Abscess | 07 | 2.3% |
| Implant removal | 18 | 6.0% |
| Congenital conditions | 01 | 0.3% |

Table 2 indicates utilization patterns of different classes of analgesics. Total number of analgesics prescribed were 338, and among the centrally acting analgesic tramadol 197 (58.3%) was the commonly prescribed analgesic followed by peripheral acting analgesics 119 (35.3%).

Out of 300 patients 262 patients (87.3%) were prescribed single analgesic either tramadol or paracetamol and 38 patients were prescribed with combination of opioid with NSAID. The commonly prescribed combination was tramadol with diclofenac 32(84.2%). Total number of drugs prescribed was 1919.

Table 2: Utilization pattern of analgesics in post operative orthopaedic patients.

| Analgesic groups | No. of analgesics | Percentage |
|--|-------------------|--------------|
| NSAID'S (Non steroidal anti-inflammatory drugs) | 141 | 41.7% |
| Diclofenac | 106 | 31.3% |
| Paracetamol | 31 | 9.2% |
| Aceclofenac | 02 | 0.6% |
| Ibuprofen | 02 | 0.6% |
| Opioid - Tramadol | 197 | 58.3% |

Along with analgesics, other most frequently prescribed concomitant drugs were antibiotics (32.7%), IV fluids (23.2%) and H₂ blockers and proton pump inhibitors (PPIs) as shown in Table 3.

Among the antibiotics cefotaxime (32.8%) and metronidazole (30.3%) are the most commonly prescribed followed by piperacillin + tazobactam (13%), ceftriaxone (11.1%), miscellaneous antibiotics (12.8%) were amikacin, ciprofloxacin, cefixime, meropenemes and vancomycin.

Rantidine (90.9%) was the frequently prescribed for reduction of acid secretion followed by pantoprazole (10.1%). Normal saline (47%) and ringer lactate (41.5%) were the commonly prescribed IV fluids. Tranexamic acid 56(2.9%) was the only prescribed antifibrinolytic. Serratiopeptidase 46(2.4%) was the only drug prescribed as anti-oedema measure. Miscellaneous drugs 109(5.7%) like losartan, amlodipine, metformin, voglibose, insulin, calcium gluconate, salbutamol, KCL, phenytoin were prescribed only in patients with concomitant diseases which are specific for their indication.

Table 3: Prescribing pattern of different group of drugs in post operative orthopaedic inpatients.

| Different group of drugs | No. of drugs | Percentage |
|----------------------------------|--------------|------------|
| Analgesics | 338 | 17.6% |
| Antibiotics | 628 | 32.7% |
| H ₂ blockers and PPIs | 297 | 15.5% |
| Parenteral fluids | 445 | 23.2% |
| Antifibrinolytics | 56 | 2.9% |
| Enzymes – Serratiopeptidase | 46 | 2.4% |
| Miscellaneous drugs | 109 | 5.7% |

Table 4 shows drugs used based on WHO indicator and NLEM^[7], polypharmacy with more than two drug was

100% and most of the drugs were prescribed by generic drugs 89.9%.

Table 4: Indicators of drug use.

| Indicators assessed | Data value |
|--|------------|
| Average number of drugs per prescription | 6.376 |
| Average number of analgesics per prescription | 1.126 |
| Percentage of drugs prescribed as per NLEM (%) | 99.2% |
| Percentage of analgesics prescribed as per NLEM (%) | 99.4% |
| Percentage of drugs prescribed by generic name | 89.9% |
| Percentage of analgesic drugs prescribed by generic name (%) | 72.5% |
| Percentage of drugs prescribed in hospital pharmacy (%) | 90% |
| Percentage of drugs prescribed outside (%) | 10% |
| Most common route of drug administration - Parenteral | 86.6% |

DISCUSSION

The present study showed male preponderance and age group of 40-60 years were more as reported in similar study by Padmanabha TS *et al.*^[8] About 6.8 million people seek medical care for fractures in India as fractures are the most common orthopaedic problems.^[9,10] Our study also reveals fractures are the most common orthopaedic problems and injection tramadol was used commonly as they reduce especially affective component when compared to NSAIDs where they are effective in relieving inflammation associated with sensory component by inhibiting the synthesis of inflammatory mediators. Prescribing tramadol than

NSAID's in post operative inpatients for ameliorating pain is more frequent nowadays some studies have reported the same and suggested that it could be due to their established safety in short course therapy.^[11,12]

Antibiotics (32.7%) were the more common Co-prescribed drugs along with analgesics (17.6%) in our study which are significantly higher compared to other study.^[12]

Among the antibiotics Cefotaxime (32.8%) was the most commonly prescribed drug as many patients suffered from haemarthroses and other bleeding conditions,

whereas in a study conducted by sushma muraraiah et al ceftriaxone was used in 62.2%.

Other concomittant drugs like H2 blockers and PPIs used along with NSAIDs were 15.5% in order to avoid gastric injury which was very less compared to other studies 22.92 %, 22.36%.^[12,13]

Average number of drugs per encounter was 6.38 in the present study which is higher compared to other studies conducted which reported 5 and 4.8 (± 1.2).^[13,12]

Percentage of drugs prescribed from National list of essential medicines in our study is 99.2%, which is highly significant than the mean from 8 different studies of 71.7%^[14] and from findings of studies conducted by Sen and bathini was (81.94%)^[15], Salman et al was (62.2%)^[16] and Agrawal et al 60.96%.^[17] Essential medicines are selected with due regards to public health, with evidence to efficacy, safety and cost effectiveness in our study majority of drugs were prescribed from NLEM.

Prescribing drugs by generic name, promote the rational use of drugs with regard to safety, efficacy, and cost by permitting the identification of the products by its scientific names. Increasing generic prescribing would rationalize the use and reduce the cost of drugs.^[18,19] Drugs prescribed by generic name in our study were more 72.5% compared to other studies it was 57.19%, 39% and 51.43%.^[13,17,18]

Percentage of drugs prescribed outside especially analgesics was less than 10% that means patients are given cost effective treatment from our hospital pharmacy.

CONCLUSION

Our study suggests opioid analgesics tramadol was used for short course with minimum side effects, and it was based on the type of surgery and physician preference.

Prescriptions of analgesics were from essential drug list and were of generic drugs. Polypharmacy was significantly high. This study highlights the need to minimize the average number of drugs per prescription. Antacids and gastroprotectives use should be still encouraged because less gastroprotectives were used along with large number of antibiotics and analgesics. Regular educational interventions to improve prescribing practices of doctors at different levels may further promote rational prescribing.

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