



# Prescribing Pattern of Analgesics in Indoor Patients of Orthopaedic Department in a Tertiary Care Teaching Hospital in North India

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## Abstract

**Introduction:** Analgesics are the most common class of drugs prescribed for various conditions in the orthopaedics inpatient department. This study was conducted to evaluate the prescribing pattern of analgesics and analyse the rational use of analgesics in orthopaedic inpatient department of tertiary care teaching hospital. **Methods:** A prospective observation study was carried out in 100 indoor patients of orthopaedics department at Govt. Medical College, Jammu. Demographic and clinical data were documented in a predesigned case record form. The type of analgesics prescribed, mono or combination therapy, number of analgesics and concomitant drugs, were analysed to obtain an overview of the current prescribing pattern and rational use of Analgesics. **Results:** Nonsteroidal anti-inflammatory drugs (NSAIDs) in mono and combination therapy were the most commonly prescribed analgesics. Proton pump Inhibitors (PPIs) were observed as most common co-prescribed drugs. **Conclusion:** NSAIDs are the most commonly prescribed analgesics. The rising trend for prescription of pregabalin and paroxetine (Selective Serotonin Reuptake Inhibitors; SSRIs) have been observed. Moreover, high number of drugs per prescription have been documented.

## Key Words

Orthopedics, Analgesics, Prescribing Pattern, Non-steroidal Anti-inflammatory Drugs (NSAIDs), Opioids

## Introduction

Drug utilization was defined as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. <sup>[1]</sup> Aims of prescribing pattern studies is to provide the feedback to the prescriber and to ensure awareness about rational use of medicines. <sup>[2]</sup> Pain is an unpleasant sensory and emotional perception which is associated with actual or potential tissue damage or described in terms of such damage. <sup>[3,4]</sup> Analgesics including non-steroidal anti-inflammatory drugs (NSAIDs)

are one of the commonly prescribed group of drugs for the management of pain and inflammation and are also the most widely prescribed class of medications worldwide and over the counter used drugs. <sup>[5,6]</sup> NSAIDs acts by inhibiting the cyclooxygenase (COX) pathway. The COX enzyme exists in two isoforms; COX-1 and COX-2. COX-1 is constitutive that regulates physiological functions such as mucus production of the stomach, kidney water excretion as well as platelet formation

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whereas COX-2 is mainly involved in the synthesis of prostaglandins during the inflammatory response. Gastrointestinal toxicity is the frequently reported adverse effect encountered with COX-1 use.<sup>[7,8]</sup> In contrast at first glance, COX-2 inhibitors look like a solution to NSAIDs induced GI complications. However, evidences of adverse cardiovascular events with the use of COX-2 selective inhibitors have created a sense of insecurity not only among prescribers, but also among consumers.<sup>[9]</sup> Besides NSAIDs, Tramadol is another commonly prescribed opioid

analgesic in orthopaedics outpatient department and it is equally efficacious as morphine or meperidine in the management of mild to moderate pain.<sup>[10]</sup> Use of opioid analgesics to suppress pain has restricted to selective cases now to minimize the risks of opioid abuse, misuse and diversion. Therefore periodic evaluation of drug utilization research needs to be done to enable suitable modifications in prescribing behaviour of medical practitioners to make medical care rational and cost effective. Rational use of medicines (RUM) is the ultimate goal of drug utilization research which is of global importance and it aims at evaluating the accessibility, availability and correct prescribing of medicines.<sup>[11]</sup> Assessment of drug utilization is also vital for economic and educational purposes. Moreover, illiteracy, limited financial resources and lack of awareness among patients, makes the RUM even more important in developing countries like India.

#### **Aims and objectives**

a) To evaluate the prescribing pattern of analgesics in orthopaedic inpatient department (IPD) of tertiary care teaching hospital of North India.

b) To Analyse the Rational use of analgesics in orthopaedic IPD.

#### **Material and Methods**

After obtaining approval of Institutional ethics committee (pharma/2021/1882), a hospital based prospective observational study was carried out in patients of either sex, and all age groups admitted in orthopedics wards of a tertiary care teaching hospital in Jammu, North India for a period of four months. Patients who were prescribed analgesics during the hospitalization were included in the study. Information extracted from randomly selected 100 medical case sheets included patient's age, sex, registration number, demographic details, disease pattern, comorbidity, diagnosis, prescribed analgesics, their dosages and route of administration, concomitant medications and any adverse event due to medication were transferred

into a predesigned data sheet. The data was analysed for average number of drugs prescribed, percentage of drugs prescribed by generic name and from national essential drug list. Statistical analysis of data was done for the continuous variables as numbers and percentage using Microsoft Excel and Chi-square test was applied for categorical variables.

#### **Results**

A total of 100 medical case sheets of patients of all age groups were evaluated. As evident from table 1, Males 74 (74%) outnumbered females 26 (26%), giving male to female ratio of 2.8:1. More than half of the sample belongs to 20-40 years of age group. The morbidity profile shows diseases related to musculoskeletal system (fractures; 61%, soft tissue injuries; 19%, osteomyelitis; 9%) were observed as the common cause for hospitalization. Total number of drugs prescribed were 406 with an average of 4.06 drugs (range 2-7) per prescription. Out of 406 prescribed drugs, 196 (48.27%) were analgesics and 210 (51.72%) were concomitant drugs that included Proton pump inhibitors (13.30%), Antibiotics (26.4%), H2 receptor blockers (2.7%), 5-HT3 receptor blockers (3.2%), Anticonvulsants (0.73%) and multivitamins (4.7%). More than half (59.1%) of the analgesics were prescribed from national list of essential medicines. The class wise distribution of analgesics prescribed is shown in table 2. Paracetamol was the most commonly prescribed analgesic (68%). During hospitalization, 84% preparations were administered by parenteral route where as 16% by oral route. Drugs prescribed as fixed dose combinations has been depicted in table 3.

#### **Discussion**

The present study was aimed to analyse the prescribing pattern of analgesics in inpatient department of orthopedics. Males (74%) outnumbered the females (26%) and majority of the patients were between 20-40 years of age. This gender difference may be due to more outdoor activities and higher incidence of trauma among young Indian males. In the present study, the base line study population was comparable to earlier studies conducted in India with an influence of gender and age in the prescription pattern.<sup>[12]</sup> The current study revealed fractures (61%) as the most common cause for hospitalization. Similar observations were reported by Mathew G *et al*<sup>[13]</sup>, who observed musculoskeletal injuries as the most common orthopaedic problems contributing about 6.8 million hospital admissions in India every year. In our study, paracetamol was the most

**Table 1. Demographic & Clinical Characteristics**

Variables	n (%) [Statistical analysis]
Males (M)	74 (74%)
Females (F)	26 (26%)
M:F ratio	2.8:1
20-40 years	52 (52%)
41-60 years	39 (39%)
61-80 years	8 (8%)
= 81 years	1 (1%)
Mean age	38.4
Fractures	61 (61%)
Soft tissue injuries	19 (19%)
Osteomyelitis	9 (9%)
Miscellaneous	11 (11%)
Total drugs prescribed	406
Average no. of drugs per prescription	4.06
Antibiotics	107 (26.4%)
Paracetamol	82 (20.19%)
NSAIDs	68 (16.74%)
PPIs	54 (13.30%)
Opioids	45 (11.08%)
Multivitamins	19 (4.7%)
5-HT <sub>3</sub> receptor blockers	13 (3.2%)
H <sub>2</sub> receptor blockers	11 (2.7%)
Pregabalin	3 (0.73%)
Paroxetine	3 (0.73%)
Average no. of analgesic per prescription	1.96
Oral vs parenteral	31 (16%) vs 165 (84%) [ $\chi^2$ with Yates correction is 89.78, p<0.00001*]
Analgesics prescribed by generic name	45 (22.95%)
Analgesics prescribed from NLEM	116 (59.1%)
Generic vs brands	45 (22.95%) vs 151 (77.05%) [ $\chi^2$ with Yates correction is 56.18, p<0.00001*]
Monotherapy vs FDC	196 (71.53%) vs 78 (28.46%) [ $\chi^2$ with Yates correction is 36.98, p<0.00001*]
Non-selective COXIs vs selective COXIs	188 (95.91%) vs 8 (4.09%) [ $\chi^2$ with Yates correction is 165.52, p<0.00001*]

commonly (67.85%) prescribed individual analgesic followed by opioids (22.95%) and diclofenac (15.30%). Tramadol was the only opioid prescribed either alone or in combination with NSAIDs. Some of the earlier studies conducted in India has reflected diclofenac as commonly prescribed analgesic for management of pain in fractures.<sup>13,14</sup> This difference in choice of analgesic may be due to different time and place of study. Moreover, NSAIDs are commonly prescribed globally for the management of pain and inflammation and the same has been reflected in this study. Gastrointestinal (GI) toxicity is the major

**Table 2. Class of Analgesics Prescribed**

Variables	Number (%)
Paracetamol	133 (67.85%)
Diclofenac	30 (15.30%)
Lornoxicam	26 (13.26%)
Aceclofenac	18 (9.18%)
Etoricoxib	8 (4.08%)
Tramadol	45 (22.95%)

**Table 3. Fixed Dose Combination (FDC) Prescribed**

Fixed dose combinations	Number (%)
Diclofenac+PCM	34 (17.34%)
Aceclofenac+PCM	26 (13.26%)
Lornoxicam+PCM	18 (9.8%)

limitation of NSAIDs and the incidence of GI toxicity is even higher with fixed dose combination (FDC) of NSAIDs. In present study, patients with severe pain and inflammation were prescribed FDC of diclofenac and paracetamol (17.34%), Lornoxicam and PCM (13.26%), aceclofenac and paracetamol (9.18%), tramadol and paracetamol (0.51%), diclofenac and serratiopeptidase (0.51%). 71.53% analgesics were prescribed as monotherapy and 28.46% as FDCs (p<0.00001). Previous studies revealed that combination of two NSAIDs is irrational and does not improve the efficacy of the treatment. Irrational FDCs increase the chances of adverse drug effects.<sup>115</sup> Gastroprotective agents such as PPIs and H<sub>2</sub> receptor blockers had been co-prescribed to avoid NSAIDs induced GI toxicity. Similar prescribing pattern was observed in studies carried out in Guwahati<sup>13</sup> and Bareilly.<sup>116</sup> Moreover, Nonselective COX inhibitors were preferred over selective COX2 inhibitors (p<0.00001). Prescription of pregabalin and paroxetine combination in 3 (0.75%) patients is in accordance with some other studies.<sup>117</sup> They have reported the combined use of pregabalin and paroxetine offers an effective method with increased tolerability to reduce the somatic and depressive symptoms of fibromyalgia and enhance the quality of life in affected individuals. Polypharmacy is an important parameter in prescription audit studies. Average number of drugs prescribed in present study was 4.06 which is almost equal (4.72 and 4.98) to some other studies conducted in India.<sup>13,18</sup> The polypharmacy can be explained by existence of comorbid conditions in elderly. It is preferable to keep the mean number of drugs per prescription as minimum as possible. This will help to avoid the drug- drug interactions and will decrease the cost of the treatment. Encouraging prescriptions by generic name is constantly suggested by several national



and international organizations to support rational use of drugs. Prescription by generic name is also known to vary widely across India, with as low as 31.94%<sup>119)</sup> and as high of 84.2%.<sup>120)</sup> The highest reported still falls short of WHO idea, which is 100%. In current study, nearly one fourth, 45 (22.95%) analgesics were prescribed by generic names indicating high preference for brand names ( $p < 0.00001$ ). Prescription under generic name has been shown to improve inventory control, easy purchase of drugs, and reduce the chances of dispensing errors and should be encouraged in current Indian scenario. In our study, 59.1% (116/196) analgesics were prescribed from national list of essential medicines (NLEM). High prevalence (62.67%) of NLEM drugs was also reported in other studies conducted in India.<sup>13)</sup> In 2010, Eze *et al*<sup>121)</sup> reported 95.4% drugs prescribed from NLEMs Nigeria.

### Conclusion

As this study was focused on the prescription patterns of analgesics, certain points can be highlighted. NSAIDs in mono and combination therapy are the most commonly prescribed analgesics. But, the rising trend for prescription of pregabalin and paroxetine (Selective Serotonin Reuptake Inhibitors; SSRIs) has been observed. Moreover, prescription of drugs by generic name is low and the average number of drug per prescription is high. Hence, such periodic studies are further required in diverse environment to revise the therapeutic guidelines accordingly to give proper care to the community.

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### Conflicts of Interest

There are no conflicts of interest.

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