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Research Article

Prescription pattern of analgesics in orthopedics outpatient department at a tertiary care hospital

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ABSTRACT

Background: Analgesics are the most common class of drugs prescribed for various conditions in the orthopedics outpatient department (OPD).
This study is performed for a better understanding of analgesics prescribing pattern in orthopedics and to correlate the use of selective cyclooxygenase-2 (COX-2) inhibitors, conventional non-steroidal anti-inflammatory drugs (NSAIDs), and opioid analgesics in practice in the present scenario.
Methods: The prescriptions from the OPD of Orthopedics at Dr. B. R. Ambedkar Medical College was reviewed between June 2013 and November 2013, entered in a pre-designed proforma. Pain was quantified using numeric rating scale. The type of analgesics administered, whether monotherapy or combined therapy and the duration of therapy, was analyzed to obtain an overview of the current prescribing pattern.
Results: A total of 300 prescriptions were analyzed. 800 drugs were prescribed with an average of 2.6 drugs per prescription. Of these, 62.3% were NSAIDs, 15.4% were opioid analgesics and 22.3% were gastroprotective agents. 61% of the NSAIDs were prescribed as monotherapy and 39% were prescribed as fixed drug combination (FDC). The ratio of selective to non-selective NSAIDs is 1.3:1.
Conclusions: The results of the present study show frequent use of selective COX-2 inhibitors, although non-selective NSAIDs topped the list of various selective NSAIDs, non-selective NSAIDs, and opioid analgesics. This suggests that gastrointestinal safety was an important concern while prescribing these drugs. Many FDCs were found to be irrational.

Keywords: Analgesics, Prescription pattern, Orthopedics, Non-steroidal anti-inflammatory drugs

INTRODUCTION

Drug utilization research was defined by WHO in 1977 as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences.

The principal aim of drug utilization research is to facilitate the rational use of drugs in populations. For the individual patient, the rational use of a drug implies the prescription of a well-documented drug at an optimal dose, together with the correct information, at an affordable price. Without the knowledge of how drugs are being prescribed and used, it is difficult to initiate a discussion on rational drug use or to suggest measures to improve prescribing habits.

Information on the past performance of prescribers is the linchpin of any auditing system. Drug utilization research in itself does not necessarily provide answers, but it contributes to rational drug use in important ways.[1]

Periodic evaluation of drug utilization patterns needs to be done to enable suitable modifications in prescription of drugs to increase the therapeutic benefit and decrease the adverse effects. The study of prescribing patterns seeks to monitor, evaluate and if necessary, suggest modifications in the prescribing behavior of medical practitioners to make medical care rational, and cost effective. Drug prescribing studies aim to provide feedback to the prescriber and to create awareness among them about rational use of medicines.[2]

Pain is an ill-defined, disabling accompaniment of many medical conditions. Analgesics are drugs, which possess significant pain relieving properties by acting in the central nervous system or on peripheral pain receptors without significantly affecting consciousness. Analgesics are

divided into two groups: (1) Narcotic/Opioid analgesics and (2) Non-narcotic/non-steroidal anti-inflammatory drugs (NSAIDs).[3]

NSAIDs are the most commonly used drugs for the management of pain and inflammation with good efficacy and represent most widely prescribed class of medications in the world and are used as over the counter drugs. They work by interfering with cyclooxygenase (COX) pathway, which involves the conversion of arachidonic acid by the enzyme COX to prostaglandins. The COX enzyme exists in two isoforms i.e. COX-1 and COX-2.[4] The COX-1 enzyme is constitutive and controls physiological functions such as stomach mucus production and kidney water excretion as well as platelet formation. In contrast, COX-2, is involved in producing prostaglandins for the inflammatory response. Despite wide clinical use of classical NSAIDs as analgesics, antipyretics, and anti-inflammatory agents, their gastrointestinal toxicity is a major clinical limitation. This adverse effect is associated with their ability to inhibit COX-1 in the gastrointestinal tract (GIT). Subsequently, the selective COX-2 inhibitors emerged as potentially gastro-friendly NSAIDs and it was conceptualized that sufficient therapeutic benefits are achieved by selective COX-2 inhibition.[5] At first glance, these COX-2 inhibitors look like a solution to NSAIDs related GI complication. However, post-marketing experience unmasked various adverse cardiovascular effects. Recent 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.[6]

Opioid analgesics produce a wide spectrum of unwanted effects, including respiratory depression, nausea, vomiting, dizziness, mental clouding, dysphonia, pruritus, constipation, increased pressure in the biliary tract, urinary retention, and hypotension.[7] Tramadol is an opioid analgesic that is frequently prescribed in orthopedics outpatient department (OPD). Tramadol is a synthetic codeine analog, which is a weak μ opioid receptor agonist. Part of its analgesic effect is produced by inhibition of uptake of norepinephrine and serotonin. In the treatment of mild to moderate pain, tramadol is as effective as morphine or meperidine.[7]

Management of pain is important in the majority of the orthopedic conditions like rheumatoid arthritis (RA), osteoarthritis (OA), chronic low back pain (LBP), musculoskeletal pain, etc.

There are a number of options among analgesics that can be chosen to manage pain which includes narcotic and non-narcotic analgesics.

METHODS

The prescriptions from the OPD of orthopedics at Dr. B. R. Ambedkar Medical College were reviewed between June 2013 and November 2013, entered in a pre-designed proforma. Both male and female patients, above the age of 18 years, who were willing to participate in the study, suffering from RA, OA, LBP, and musculoskeletal pain were included in the study. The individual data collected from the prescriptions was analyzed on the following parameters: Demographic profile, type of analgesics used and type of therapy - monotherapy or fixed drug combination (FDC) therapy. Institutional Ethics Committee approval was taken from Dr. B. R. Ambedkar Medical College, Bengaluru.

RESULTS

In a 6 months period from June 2013 to November 2013, a total of 300 patients attending the orthopedics OPD at Dr. B. R. Ambedkar Medical College who met the inclusion criteria were included in the study and their prescriptions were analyzed. Informed consent was obtained from all the patients. The demographic profile has been described in Figures 1 and 2.

A total of 800 drugs were prescribed, out of which 747 were oral, 53 were topical. Of the 800 drugs, the total

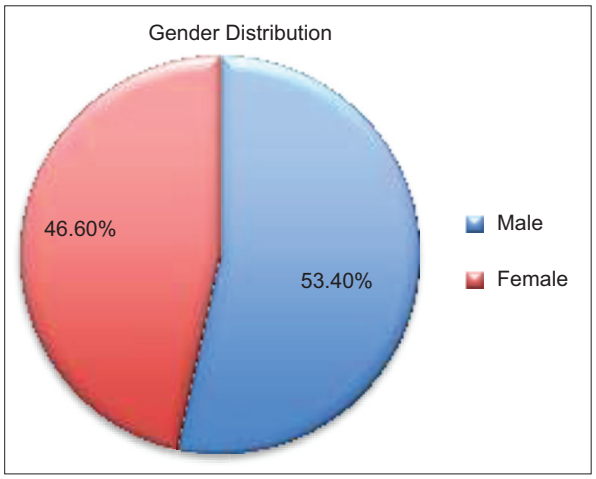

Figure 1: Gender distribution of patients.

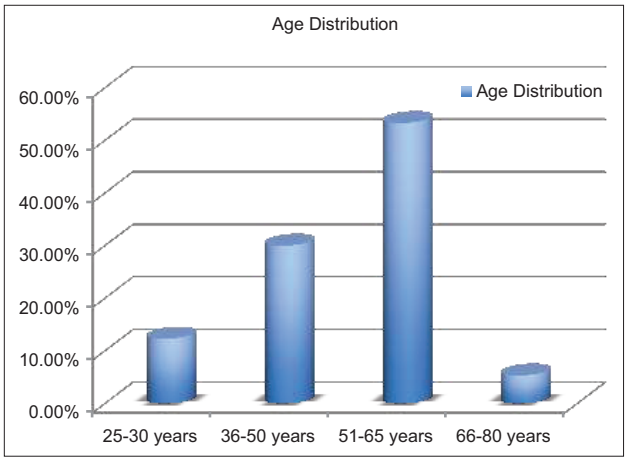

Figure 2: Age distribution of patients.

number of non-selective NSAIDs used was 393 (49.25%), selective NSAIDs was 105 (13.12%), opioid analgesics was 120 (15%), H1 blockers was 24(3%), proton pump inhibitors (PPIs) was 108 (13.5%), and muscle relaxants was 50 (6.25%) (Table 1). Of the 300 patients, 227 (75.66%) received FDCs. Among non-selective NSAIDs diclofenac (15.5%) followed by paracetamol, etodolac, aceclofenac, ibuprofen, and piroxicam were the conventional older NSAIDs commonly used and among newer selective COX-2 inhibitors etoricoxib was the only drug prescribed. Among opioid analgesics tramadol was prescribed both as monotherapy and as FDC with NSAIDs (Table 2).

FDC of diclofenac with paracetamol (27.31%) was the most commonly prescribed followed by a combination of diclofenac, paracetamol with chlorzoxazone (13.65%). In 16.5% of prescriptions, gastroprotective agents (H_1 blockers and PPIs) were used along with NSAIDs and pantoprazole was the most commonly prescribed (Table 3).

DISCUSSION

This study shows that conventional non-selective NSAIDS specially diclofenac continues to top the list of NSAIDs used in Orthopedic OPD. Selective COX-2 inhibitors continue to be used, but their use has declined probably due to the increased risk of heart attack and stroke associated with etoricoxib and other coxibs.[7] Diclofenac accumulates in synovial fluid after oral administration, which explains why its duration of therapeutic effect is considerably longer than plasma $t_{1/2}$.[7] This is one of the reasons for its extensive use in RA and OA. The use of H1 blockers and PPIs concurrently with non-selective NSAIDs clearly shows that GI discomfort is a very significant consideration while prescribing these non-selective NSAIDs. There is substantial use of etoricoxib mainly because it doesn't cause GI side-effects. Among opioid analgesics, tramadol is the most commonly prescribed drug either alone or in combination with NSAIDs.

This study shows substantial use of FDC of analgesics. Combining two NSAIDs is irrational as the two drugs act on the same pathway and there is no synergism when two drugs acting on the same enzyme are combined. Thus combining two NSAIDs does not and cannot improve the efficacy of treatment. These irrational FDCs increase chances of adverse drug effects and drug interactions compared with both drugs given individually.[8] Combining opioid analgesics with NSAID is more rational, as the two drugs act on different pathways.

CONCLUSION

This study shows that diclofenac is the most frequently prescribed analgesic in orthopedics OPD at this hospital. The extensive use of irrational FDCs must be curtailed.

Table 1: Class of drugs prescribed.

Class of Drugs	Number of drugs prescribed	Percentage
Non-selective NSAIDs	393	49.25
Selective NSAIDs	105	13.12
Opioid analgesics	120	15.00
H_1 blockers	24	03.00
PPIs	108	13.50
Muscle relaxants	50	06.25
Total	800	100

NSAIDs: Non-steroidal anti-inflammatory drugs, PPIs: Proton pump inhibitors

Table 2: Details of drugs prescribed.

Drug name	Number of prescriptions	Percentage
Diclofenac	124	15.50
Aceclofenac	47	5.87
Etodolac	62	7.75
Etoricoxib	105	13.12
Tramadol	120	15.00
Paracetamol	89	11.12
Ibuprofen	49	6.12
Piroxicam	22	2.75
Ranitidine	24	3.00
Pantoprazole	108	13.50
Chlorzoxazone	22	2.75
Tizanidine	28	3.50
Total	800	100

Table 3: Details of FDC.

FDC	Number of patients	Percentage
NSAIDs+NSAIDs		
Diclofenac+Paracetamol	62	27.31
Aceclofenac+Paracetamol	16	7.04
Ibuprofen+Paracetamol	23	10.13
Etoricoxib+Diclofenac	12	5.28
Piroxicam+Paracetamol	22	9.69
NSAIDs+muscle relaxants		
Diclofenac+Chlorzoxazone	10	4.40
Diclofenac+Tizanidine	17	7.48
Aceclofenac+Chlorzoxazone	06	2.64
Diclofenac+Paracetamol+ Chlorzoxazone	31	13.65
NSAIDS+Opioids		
Paracetamol+Tramadol	23	10.13
Diclofenac+Tramadol	05	2.20
Total	227	100

FDC: Fixed drug combination, NSAIDs: Non-steroidal anti-inflammatory drugs

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Ethical approval: The study was approved by the Institutional Ethics Committee

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