

STUDY OF RATIONAL PRESCRIBING AND DISPENSING OF PRESCRIPTIONS WITH NON-STEROIDAL ANTI-INFLAMMATORY DRUGS IN ORTHOPEDIC OUTPATIENT DEPARTMENT

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ABSTRACT

Objective: To study the prescribing pattern of non-steroidal anti-inflammatory drugs (NSAIDs) in outpatient orthopedic hospitals from a rural area of Maharashtra, India.

Methods: A total of 237 prescriptions containing NSAIDs evaluated for their distribution according to the classification of NSAIDs and World Health Organization core indicators for prescribing practices and patient care.

Results: The average number of drugs per prescription was 3.5. The average number of NSAIDs per prescription found to be 1.12. The incidence of generic prescribing was very low. The overall average consultation time and dispensing time found to be 4.5 and 1.9 minutes respectively. The percentage of drugs adequately labeled was 61.44%. Out of the 843 drugs, 267 were systemic NSAIDs, of which 50.56% and 49.43% used as monotherapy and fixed dose combinations respectively. The prescriptions are containing either one or two NSAIDs. Non-selective NSAIDs most commonly prescribed than selective cyclooxygenase-2 (COX2) inhibitors and highly selective COX2 inhibitors. The ratio of non-selective to selective NSAID usage pattern was 1:1.28.

Conclusion: The study shows more use of traditional NSAIDs and underutilization of COX2 inhibitors. The study suggests that there is the immense scope of improvement for prescribing in the hospitals.

Keywords: Prescribing pattern of non-steroidal anti-inflammatory drugs, Rational use of non-steroidal anti-inflammatory drugs, World Health Organization core drug use indicators.

INTRODUCTION

Rational use of medicines defined as patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community. Prescriptions hold a special importance regarding the rational use of drug related to cost, safety, and efficacy. Prescriptions permit the identification of the products by its scientific names. Prescribing and dispensing pattern studies are one of the best methods to determine rational prescribing [1].

One of the most widely used and abused drugs all over the world are pain-killers, pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Fever and pain are usually the early symptoms of most of the inflammatory diseases. The introduction of non-steroidal anti-inflammatory drugs (NSAIDs) was a landmark event to control pain and they become the most widely used medication not only for the relief of pain and fever, but also for their anti-inflammatory effect [2].

NSAIDs constitute the largest single group of drugs used worldwide, resulting in enormous exposure of patients to this group of drugs and their associated risks. NSAIDs form one of the most prescribed classes of drugs in the orthopedic department. NSAIDs are commonly used in the elderly for the treatment of fever, pain, pain associated with inflammation in rheumatoid arthritis and osteoarthritis, neuromuscular disorders, headache, and musculoskeletal conditions [3,4]. Musculoskeletal disorders are the most frequent cause of physical disability in developed countries. They have a substantial impact on health and impose a heavy economic burden on health care systems. According to World Health Organization (WHO), musculoskeletal disorders are the most frequent cause of disability in

the modern world, and the prevalence of these diseases is rising at an alarming rate. The most prominent reason for the loss of joint mobility and function is chronic or episodic pain, which leads to psychological distress and impaired quality of life [5].

However, NSAIDs having an anti-inflammatory effect, and they are associated with the serious gastrointestinal adverse effect. Their excessive use may result into serious adverse event diminishing their pharmacological effect [3]. A prescription-based survey considered as one of the most effective methods to assess and evaluate the prescribing attitude of physicians and dispensing practice of pharmacists. The study of prescribing pattern seeks to monitor, evaluate and suggest modifications in practitioners prescribing habits to make medical care rational and more effective. Study of prescribing pattern provides information on the rational use of the drug as rational use of the drug based on rational prescribing [6].

The main objective of this study was to obtain information regarding the prescribing attitude towards NSAIDs by the medical prescribers from the outpatient department (OPD) of orthopedic private clinical setting. Also to the prescribing pattern of NSAIDs, we evaluated the data for WHO core indicators regarding prescribing practices and patient care to study rational prescribing.

METHODS

This prospective study undertaken for 6 months (December 08 - May 09) in OPD of two private hospitals in Chopda (rural area) of Maharashtra. Prescriptions collected from patients who were attending OPD for the first time. Once the consultation by physician completed, the prescriptions were copied after receiving verbal consent from the patient.

The prescriptions analyzed for following indicators [7,8]:

- WHO core indicators for prescribing practices and patient care
 - i. Prescribing indicators:
 - A. Average number of drugs prescribed per encounter was calculated by dividing the total number of different drug products prescribed by the number of prescriptions surveyed
 - B. Percentage of drug prescribed by generic name calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100
 - C. Percentage of encounters prescribed with antibiotics
 - D. Percentage of encounters prescribed with injections calculated by dividing the number of patient encounters during which an antibiotic or an injection was prescribed by the total number of encounters surveyed multiplied by 100
 - E. Percentage of drugs prescribed from essential drug list (EDL) calculated by dividing the total number of products prescribed from EDL by the total number of drugs prescribed multiplied by 100.
 - ii. Patient care indicators:
 - A. Average consultation time was determined by dividing the total time for a series of consultations, by the actual number of consultations
 - B. Average dispensing time was determined by dividing the total time for dispensing drugs to a series of patients by the number of encounters
 - C. Percentage of drugs actually dispensed calculated by dividing the number of drugs dispensed by total number of drugs prescribed multiplied by 100
 - D. Percentage of drugs adequately labeled calculated by dividing number of packages containing information about when the drug should be taken divided by the number of drugs dispensed
 - E. Patients knowledge about correct dosage was found by dividing the number of patients, who can adequately report the dosage schedule for all drugs, by the total number of patients interviewed, multiplied by 100.

In addition, above indicators prescriptions were also analyzed for following indicators:

1. Percentage of distribution of NSAIDs according to the cyclooxygenase-2 (COX2) enzyme selectivity for inhibition
2. Selective: Non-selective NSAID usage ratio
3. Percentage of drugs to minimize adverse effect of NSAIDs
4. Duration of prescription
5. Average cost per prescription.

NSAIDs classified according to the selectivity for inhibition of the two major isoforms of COX enzyme, as follows [9].

Class 1: Non-selective COX inhibitors - diclofenac, ibuprofen, indomethacin, mefenamic acid, naproxen, paracetamol, etodolac, lornoxicam, aceclofenac, ketoprofen.

Class 2: Selective COX2 inhibitors - ketorolac, nimesulide.

Class 3: Highly selective COX2 inhibitors - etrocoxib, lumirocoxib.

RESULTS

In the present prospective study, 260 prescriptions were collected during a period of 6 months. Out of total 260 prescriptions, 237 prescriptions containing NSAIDs evaluated for prescribing pattern. The demographic profile of patients is shown in Table 1.

Number of patients treated with no or single drug were 0%. The average number of drugs per prescription was 3.5. The maximum number of drug per prescription was 5 whereas 3 drugs were majorly prescribed. The average number of NSAIDs per prescription found to be 1.12. All the prescriptions containing brand names, the incidence of generic prescribing was very low. The percentage of a

prescription containing injection and antibiotic were 17.21% and 8.43%, respectively.

The overall percentage of drugs prescribed from an EDL of India was 51.05%. The overall average consultation time was found to be 4.5 minutes. The average time taken to dispense the drugs was found to be 1.9 minutes. The overall percentage of drugs dispensed was 81.61%. The percentage of drugs adequately labeled was 61.44% and the average proportion of patients who knew the drug dosage was 80% and in some instances as high as 100% (Table 2).

The prescriptions contain total 843 drugs out of which 683 were oral and 160 were topical gels. Out of the total number of drugs, 267 were systemic NSAIDs, which were distributed as monotherapy and fixed dose combinations (FDCs). Out of 267 systemic NSAIDs, 135 (50.56%) were used as monotherapy and 132 (49.43%) were used as FDCs. The prescriptions are containing one or two NSAIDs and 80.59% of patients receiving single NSAID while 19.4% receiving two NSAIDs (Fig. 1).

According to the classification of NSAIDs non-selective NSAIDs were most commonly prescribed than selective COX2 inhibitors and highly

Table 1: Demographic characteristics

Patient characteristics	n (%)
Age	
1-17	24 (10.12)
18-40	91 (38.39)
41-60	86 (36.28)
Above 60	36 (15.18)
Total	237
Sex	
Male	138 (58.22)
Female	99 (41.77)

Table 2: WHO core drug use indicators

Core indicators	Data
Prescribing practices	
Average number of drugs per prescription	3.5
Generics	0%
Antibiotics	8.43%
Injections	17.21%
On EDL	51.05%
Patient care	
Average consulting time	4.5 minutes
Average dispensing time	1.9 minutes
Drugs dispensed	81.61%
Adequate knowledge	61.44%
Adequate labeling	80.00%

WHO: World Health Organization, EDL: Essential drug list

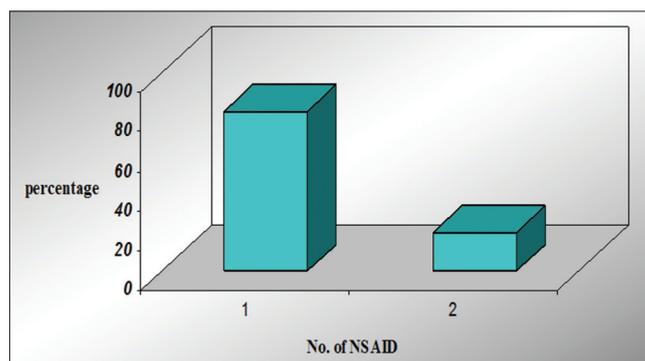


Fig. 1: Number of non-steroidal anti-inflammatory drugs per prescription

selective COX2 inhibitors. Non-selective NSAID prescribed in 45.99% of prescription. Selective COX2 inhibitors and highly selective COX2 inhibitors constitute for 30.8% and 23.2%, respectively (Fig. 2).

The ratio of non-selective to selective NSAID usage pattern was 1:1.28. Nimesulide was the most commonly prescribed NSAID, followed by diclofenac while lornoxicam and lumiracoxib were the least prescribed drugs. Various clinical studies related to NSAIDs concluded that non-selective and to some extent, selective NSAIDs are majorly associated with gastrointestinal complications, so to minimize their adverse effects; antacids prescribed in 83.96% of prescription. The most commonly used antacids were ranitidine and pantoprazole from the class of H₂ receptor blocker and proton pump inhibitors respectively. In the present study, H₂ blocker and proton pump inhibitors prescribed in 55.77% and 45.22% of prescriptions, respectively. The other concomitant medication was calcium preparation and enzymes (Table 3). NSAIDs prescribed for the duration of 1-15 days. Most of prescription given for the duration of 4-7 days. Average cost per prescription was 192.5 Indian rupees.

DISCUSSION

Prescription based survey provides the reflection of clinical judgment. The most common class of NSAIDs used was non-selective NSAIDs. Though non-selective NSAIDs constitute the major portion of total NSAIDs prescribed, nimesulide was the most commonly prescribed drug. Fixed dose combinations provide the advantage of fewer pills to be taken and thereby improve patient adherence. This study reported that 43.45% of prescription with FDCs. This number is higher than the Western Nepal study and comparable to North Indian study [9]. As NSAIDs related with gastrointestinal adverse effect, antacids were prescribed in 83.96% of prescription. The average number of drugs per prescription is a measure of polypharmacy. Polypharmacy leads to increase in adverse effect and drug interaction. The average number of drugs per prescription was found to be 3.5, this number is very high than the WHO recommended a limit of 2. The inclusion of four or more drugs in the same prescription was observed in 36.7% of cases, which is substantially more than reported in most Western countries and Dubai [10]. This study reports no drugs were prescribed by generic name, which is an example of irrational prescribing. Generic drugs are more economic than brand ones. Pressure from pharmaceutical companies may be one of the reasons for writing trade name. In Nepal 44% of drugs prescribed by generic names [9]. Antibiotics and injection are highly overused and costly forms of therapy [11]; but this study shows their low to moderate use. The use of injections found to be moderate as the study

carried out in OPD of Orthopaedic Hospitals. Percentage of drugs prescribed from National EDL is to measure the degree to which practices confirm to National Drug Policy [12]. The percentage of drugs prescribed from National EDL was 51.05%. The patient care indicators address the aspects of patient experiences at health care center and their information regarding the use of drugs dispensed to them. The time prescribers and dispensers spend with each patient sets an important limit on the potential quality of diagnosis and treatment. The average consultation time given to the patient at each hospital was 4.5 minutes. This finding is higher than the time observed in Jordan and Malawi. The consulting time is insufficient, as this consultation results in the complete evaluation of the patient and according to that medication is given. The consulting time should be improved to have a proper physician-patient interaction, is insufficient. The average time is taken to dispense the drugs was found to be 1.9 minutes; this time is longer than the time observed in studies from Jordan, Nigeria [13]. More time is given to dispense the drugs provide complete information to the patient and may increase patient adherence to the drug.

The percentage of drugs actually dispensed was 81.61% that is comparable to the range observed in Jordan. The percentage of drugs adequately labeled was 61.44%, which is lower than the range observed in Jordan and Nepal. Such a less number of drugs with adequately labeling as topical gels are not labeled. The patient’s knowledge of correct dosages is to measure the effectiveness of information given to patients on the dosage schedule of the drugs they receive. The average proportion of patients who knew the drug dosage was 80% and was found to be as high as 100%. This value is similar to the values observed in Jordan, Nigeria but higher than Bangladesh [2,13].

CONCLUSION

On the basis of the data obtained from the present study, it was found that although the use of low-risk traditional NSAIDs, co-prescription of antacids, supplements are some of the positive points in the management pattern. However, still considerable scope of the improvement in the prescribing pattern such as underutilization of newer NSAIDs and over prescription of nimesulide was observed. Despite the limitations of the present study, which include the short duration of the study, a small number of prescriptions studied, we conclude that drug prescription practices in hospitals should improve. The prescribers should be educated about generic prescribing which may have a multitude of benefits including cost minimization. The study suggests that there is the immense scope of improvement in prescribing and dispensing in the hospitals to achieve standards of rational prescribing.

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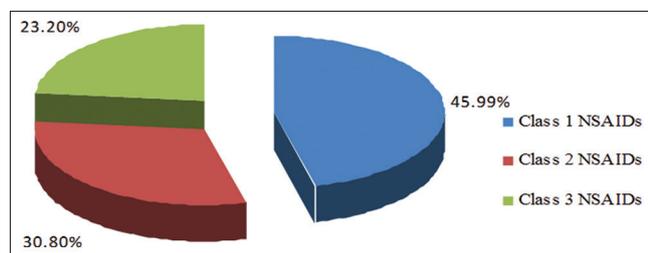


Fig. 2: Distribution of non-steroidal anti-inflammatory drugs

Table 3: Concomitant medications

Additional drug	Percentage
Calcium supplements	84.38
Drugs to minimize adverse effects of NSAIDs	83.96
H ₂ blockers	54.77
Proton pump inhibitors	45.22
Enzymes	4.21

NSAIDs: Non-steroidal anti-inflammatory drugs

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