



CURRENT TRENDS OF PRESCRIBING PATTERNS OF NSAIDS IN AN ORTHOPAEDIC OPD IN A TEACHING HOSPITAL

SINGH V¹ , YADAV P^{2*} AND DEOLEKAR P³

Orthopaedic consultant¹, Professor^{2}, Assistant Professor³ Dr D Y Patil Medical College, Navi Mumbai.*

ABSTRACT

There are a variety of NSAIDs available for prescription: traditional non selective (NSAIDs), and the more selective COX-2 inhibitors (Coxibs). The analgesic effects of the different NSAIDs are more or less identical; however, the Coxibs are associated with a lower risk for upper gastrointestinal side effects. Thus, the Coxibs after their introduction become an alternative to traditional NSAIDs in patients exhibiting risk for upper gastrointestinal bleeding. However, Post marketing experience unmarked various adverse cardiovascular effects. Evidences of adverse CVS events with the use of COX-2 selective inhibitors have led to their decreased use. The aim of the study was to analyze the prescribing pattern of NSAIDs in patients attending Orthopedics OPD and to correlate the use of selective COX-2 inhibitors and older conventional NSAIDs in practice and also to determine type and frequency of gastro-protective drugs used with NSAIDs. The data was collected from the out-patient case sheets of the patients who were attending Orthopedic out-patient departments (OPDs) for a period of 6 months. NSAIDs were prescribed to 48.19% of the patients. Coxibs and Non Selective NSAIDs accounted for 1.51% and 45.71% respectively. Monotherapy was given to 14.39% and FDCs accounted for 19.29%. Diclofenac 11.77 %, was the commonest prescribed NSAID in monotherapy while Paracetamol 15.12% in FDCs. Maximum number (97.66%) of patients were co- prescribed gastro protective drugs (GPDs) commonest being Rabeprazole 12.19%. The use of Coxibs have decreased to great extent because of reports of cardiovascular adverse effects. The conventional non selective NSAIDs are generally co prescribed with gastro protective drugs.

KEY WORDS: Non Selective NSAIDS ,Coxibs, gastroprotectives, proton pump inhibitors,



YADAV P

Professor Dr D Y Patil Medical College, Navi Mumbai

*Corresponding author

INTRODUCTION

Drug utilization research (DU) 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 aims of DU being to monitor, evaluate and if necessary, suggest modifications in the prescribing behavior of medical practitioners to make medical care rational and cost effective.¹ They provide insight into the efficiency of drug use. Also assessment is important for clinical, economic and educational purposes. DU provides feedback to the prescriber and to create awareness among them about rational use of medicines.² This study would help in Improving quality of prescription for rational use of drugs. Also Health budgeting & purchase of medicine get influenced by these studies.

The objectives of this study are

- to Correlate the use of selective COX-2 inhibitors and older conventional non selective NSAIDs in practice.
- to record prescribers preferences with regard to class and subclass of NSAIDs.
- to identify the most common fixed dose combinations of NSAIDs prescribed.
- to determine type and frequency of gastro-protective drugs used with NSAIDs.

Non-steroidal anti-inflammatory drugs (NSAIDs) : anti-inflammatory, analgesic, and antipyretic effects and inhibit thrombocyte aggregation.³ Most commonly used classes of medications worldwide. Estimated use more than 30 million. They are used in the management of musculoskeletal discomfort and other causes of pain and inflammation associated with variety of medical conditions like Rheumatoid arthritis, Osteoarthritis, Cervicalspondylitis, Ankylosingspondylitis, Migraine, Low back pain etc. Good efficacy and represent most widely prescribed class of medications and are used as over the counter drugs (OTC).⁴ At present; more than 20 different agents approved by the Food and Drug Administration (FDA) and available to the primary care physician.

According to the selectivity for inhibition of the two major isoforms of cyclooxygenase (COX) enzyme, the NSAIDs are classified as follows.

- ▶ Non-selective COX inhibitors - Aspirin, Diclofenac, Ibuprofen, Indomethacin, Mefenamic acid, Naproxen, Paracetamol, Piroxicam
- ▶ Preferential COX2 inhibitors - Ketorolac, Meloxicam, Nabumetone, Nimuselide
- ▶ Highly selective COX2 inhibitors – Celicoxib, Rofecoxib⁵

The adverse effects due to NSAIDs are

Allergic reactions, skin reactions, gastrointestinal effects, renal complications, alteration of hepatic enzyme levels and rarely hepatopathies.³ Adverse effects like the risk of peptic ulcer perforation, upper gastrointestinal bleeding, has reduce the use of NSAIDs. Many of these events are avoidable; a review of physician visits and prescriptions estimated that unnecessary prescriptions for NSAIDs were written in 42% of visits.^{6,7,8} COX-2 inhibitors, looked like solution to NSAIDs related GI complication. However, Post marketing experience unmarked various adverse cardiovascular effects. But evidences of adverse CVS events with the use of COX-2 selective inhibitors have created a sense of insecurity not only among prescribers but also among consumers.^{9,10,11}

MATERIALS AND METHODS

The design of this is a randomised prospective survey study. The data collected from the out-patient case sheets of the patients attending Orthopedic out-patient departments (OPDs) during a span of 6 months in a tertiary teaching hospital. The Institutional Ethics Committee's approval obtained before starting the study. The Inclusion & exclusion criteria being as follows: Inclusion criteria: Patients of either sex, Patients treated with at least one NSAIDs, Pregnant and lactating patients were also included, Exclusion

criteria: Patients who are not treated with NSAIDs, Patients refusing the consent. NSAID prescribed and other data will be documented in a specially designed proforma, with following details.

- Demographic profile: Name, age, gender, and date.
- Diagnosis for which NSAID is prescribed.
- Details of NSAID prescription:
 - Brand/generic name, class, dosage, route, frequency and duration.
 - fixed dose combinations if used , if any.
- Use of any gastro-protective drugs prescribed.

RESULTS

Demography

One thousand two hundred and forty patients were randomly selected of the patients attending the orthopaedics OPD. 670 (54.02%) were male, and 570 (45.96%) female patients. Low back ache, 498(44.4 %) was the most common reason for attending the orthopaedics

OPD. The other common diagnoses were spondylosis , fractures and sprain . Maximum number of patients 334 (27.6%) were in the age range of 31-40 years, 280 (22.6%) patients in the range of 41 – 50 years followed by 210 (17%) 21-30.

Drugs prescribed

A total of 3959 drugs were prescribed. (table no 1) The mean \pm SD number of drugs per prescription was 3.19. None of the drugs was prescribed by generic name. The most commonly prescribed categories of drugs are shown in table no 1. NSAIDs were the most commonly prescribed category followed by anti ulcer multivitamin and mineral preparations and antibiotics drugs. The anti-ulcer drugs in all instances (97.66 % of the patients) were prescribed to reduce or prevent the gastrointestinal irritation caused by NSAIDs. This was arrived at by analysis of the prescriptions and discussion with the consultants of the department of orthopaedics.

Category of drugs	Number (%)
NSAIDs	1908 (48.19%)
Anti-ulcer drugs	1211 (30.58%)
Multivitamins & minerals	628 (15.89 %)
Centrally acting skeletal muscle relaxants	142 (3.58%)
Others (antibiotics, antigout drugs, anti TB drugs, serratiopeptidase preparations etc.)	70 (1.76%)
Total	3959 (100%)

Table no 1
Drugs prescribed

Pattern of NSAIDs used in Orthopedics OPD

Out of the total of 1908 NSAIDS prescribed, 1870 were oral, 30 were administered by topical route and 8 were given by injectable method. The number of NSAIDs prescribed per prescription were as follows: monotherapy was prescribed to 610 patients. Polypharmacy with two NSAIDs and 3 NSAIDs were prescribed to 1184 and 114 patients respectively. The

commonly used NSAIDs used in Orthopedics OPD were as follows: FDCs (19.19%) were more commonly prescribed than monotherapy (14.39%). Paracetamol (15.12%) was the most commonest prescribed NSAID in FDCs. Diclofenac (11.77%) being the most commonly prescribed NSAID in monotherapy. Coxibs were infrequently prescribed. (1.51 %). Their description is as follows in the table no 2 and 3.

Table no 2
Pattern of NSAIDs used in Orthopedics OPD

Topically used nsoids	30
Parenteral NSAIDS	8
Total number of non-selective NSAIDs	1810
Total number of selective NSAIDs	60
Total number of non-selective NSAIDs (oral route)	a) As monotherapy : 570 b) As F.D.C with other NSAIDs - 620 c) as FDC with other drugs : 142
Total number of NSAIDs	1908

Name of the NSAID	Number (%)
Non-Selective (monotherapy)	
Diclofenac	466
Aceclofenac	377
Lornoxicam	88
Piroxicam	67
Ibuprofen	123
Naproxen	20
PCM	620
Nimesulide	49
Selective	
Paracoxib	12
Etoxicoxib	48

Table no 3
categories of NSAIDS prescribed

Gastroprotective Agent co-prescribed with NSAIDS

Maximum number 1211 (97.66%) of patients were prescribed gastro protective drugs (GPDs). NSAIDs (48.19%) commonly co-prescribed with gastroprotectives. (30.58%). Proton pump inhibitors (27%) were the most frequently prescribed with NSAIDs. Misoprostol not used at all, probably because of its higher costs, frequent side effects and the need for multiple daily dosing. Antiulcer drugs were not prescribed along with naproxen (10) [0.85%], Nimesulide and Paracetamol FDCs (11)(0.90%), and Coxibs (9)(0.74%).

DISCUSSION

The mean \pm SD number of drugs per prescription was 3.19. The average (mean) number of drugs per prescription is an important parameter while doing a prescription audit. The mean number of drugs was more than two in other studies reported in the literature, the average number of drugs per prescription in the

outpatient departments was ranging from 2.47 to 3.25. ^(12, 13) NSAIDs 1908 (48.19%) were the most commonly prescribed category followed by anti ulcer 1211 (30.58%), multivitamin and mineral preparations and antibiotics drugs. These finding were similar to other studies conducted in orthopedic OPD. ^(12, 13, 14,15) Maximum number 1211 (97.66%) of patients were prescribed gastro protective drugs (GPDs). NSAIDs (48.19%) commonly co-prescribed with gastroprotectives. (30.58%). Proton pump inhibitors (27%) were the most frequently prescribed with NSAIDs. Misoprostol not used at all, probably because of its higher costs, frequent side effects and the need for multiple daily dosing. Proton pump inhibitors were drugs used maximally to prevent adverse effects in medical outpatient departments of some three teaching hospitals, while H₂ blockers were the drugs used maximally in surgical outpatient departments of some teaching hospitals⁽¹⁶⁾ Similar findings were in certain other studies. ^(17, 18, 19, 20) The superiority of COX-2 selective drugs over non-selective drugs

regards gastrointestinal safety is there but clinical experience has put their safety in question. The withdrawal of rofecoxib and valdecoxib by the manufacturing company, because of causing them causing cardiovascular side effects, has probably changed the prescribing pattern of NSAIDs.

After the withdrawal of COX-2 inhibitors rofecoxib and valdecoxib, this study has documented a drastic decline (1.51%). Non selective NSAIDs accounted for (45.71 %) total drugs prescribed. These findings are similar to other studies conducted^(21, 22) The common problems observed were as follows: the diagnosis was not written in 547 (44.10%) of the prescriptions. The reasons on consultation could be that these were initial prescriptions and diagnosis to be established only after the investigations. The duration of treatment was not written in 124 (10%) of the prescriptions. There was no generic prescribing in any of the prescriptions. The Limitations of the study are that the main co- morbid conditions, seasonal variations in disease and prescribing patterns are not been taken into account. The number of prescriptions were low. Prescriptions were randomly selected for analysis and these may not have been representative of the patient

population. The adverse effects of NSAIDs were not recorded. The patients' knowledge of the correct dose, proper time to take the medicine, whether the medicine to be taken before or after food and the proper method of applying topical preparations were not ascertained. The prescribers were aware of the study and this may have influenced prescribing habits.

CONCLUSION

After the withdrawal of COX-2 inhibitors rofecoxib and valdecoxib, this study documented a drastic decline (1.51%). Non selective NSAIDs accounted for (45.71 %) total drugs prescribed. FDCs (19.19%) were more commonly prescribed than monotherapy (14.39%). Paracetamol (15.12 %) was the commonly prescribed NSAIDs in FDCs and Diclofenac (11.77%) is the most commonly non selective NSAID in monotherapy. 97.66% of patients were prescribed gastro protective drugs. Non selective NSAIDs were commonly co-prescribed with gastroprotectives. Proton pump inhibitors (27%) most frequently coprescribed with NSAIDs.

REFERENCES

1. Hogerzeil HV. Promoting rational prescribing:an international perspective. Br J Clin Pharmacol1995; 39: 1-6.
2. Pradhan SC, Shewade DG, Shashindran CH,Bapna JS. Drug utilization studies. Natl Med J India 1988; 1: 185-189.
3. Kalpan B, Swain RA. NSAIDs-are there any difference. Arch FAM Med 1993; 2: 1167-74.
4. Malhotra S, Jain S, Gupta M, Aggarwal A, Pandhi P. Pattern of prescription of non-steroidal anti-inflammatory drugs in orthopedic outpatient clinic of a North Indian tertiary care hospital. Indian j pharmacol 2005; 37: 404-5.
5. Frolich JC. A classification of NSAIDs according to the relative inhibition of cyclooxygenase isoenzymes. Trends Pharmacol Sci 1997; 18: 30-4.
6. Straand J. Rokstad KS. Elderly patients in general practice: diagnoses, drug and inappropriate prescriptions. a report from the more and romsdal prescription study. FAM Pract 1999; 16(4): 380-8.
7. WHO and the International Federation of Medical Student's Associations. World Health Global Survey on Geriatrics in the Medical Curriculum 2002; 1-51.
8. Durrance SA. Older adults and NSAIDs: avoiding adverse reactions. Geriatr Nurs 2003; 24(6): 348-52.
9. Bishnoi M, Kumar A, Kulkarni SK. Prescription monitoring of management pattern of osteoarthritis with non-steroidal anti-inflammatory drugs at PUHC,

- Chandigarh in India. *Indian J Pharm Sci* 2006; 68: 525-7.
10. Green GA. Understanding NSAIDs: from aspirin to COX-2. *Clin Cornerstone*. 2002; 3:50- 59.
 11. Tandon VR. Pain killers and cardiovascular toxicity. *Health Line Fam Med J* 2006 ; 4(4) : 33-34.
 12. Rishi RK, Sangeeta S, Surendra K, Tailang M. Prescription audit: experience in Garhwal (Uttaranchal), India. *Trop Doct* 2003; 33: 76-79
 13. Rahman MS, Begum ZA, Samad MK. Prescribing pattern of non-steroidal anti-inflammatory drugs at outpatient departments of teaching hospitals. *Bangladesh J Pharmacol* 2007; 2: 1-6.
 14. Pullar T and Wright V. Pattern of nonsteroidal anti-inflammatory drug prescribing in a teaching hospital rheumatology unit. *Proceedings of the BPS*, 12-14 July, 1989;750.
 15. Sharma T, Dutta S, Dhasmana DC. Prescribing pattern of NSAIDs in orthopaedic OPD of a tertiary care teaching hospital. *J K Science* 2006; 8(3): 160-2.
 16. Sommerville K, Faulkner G and Langman M. Non-steroidal anti-inflammatory drugs and bleeding peptic ulcer. *Lancet*. 1986;462-64.
 17. Durrance SA. Older adults and NSAIDs: avoiding adverse reactions. *Geriatr Nurs* 2003; 24(6): 348-52.
 18. Rahman MS, Begum ZA, Samad MK. Prescribing pattern of non-steroidal anti-inflammatory drugs at outpatient departments of teaching hospitals. *Bangladesh J Pharmacol* 2007; 2: 1-6.
 19. Sturkenboom MC, .Burke TA, Tangelder MJ, Dieleman JP, Walton S, Goldstein JL. Adherence to proton pump inhibitors or H2-receptor antagonists during the use of non-steroidal anti-inflammatory drugs. *Aliment Pharmacol Ther*. 2003;18(11-12):1137-47.
 20. Smalley W, Stein CM, Arbogast PG, Eisen G, Ray WA, Griffin M. Underutilization of gastroprotective measures in patients receiving nonsteroidal antiinflammatory drugs. *Arthritis Rheum* 2002;46:2195–200.
 21. Lamarque D. Safety of selective inhibitors of inducible cyclooxygenase -2 taken for a long period. *Bull Cancer* 2004 ; 91 : 117-24.
 22. Mukherjee D, Nissen SE, Topol EJ. Risk of Cardiovascular events associated with selective COX2 inhibitors. *JAMA* 2001 ; 286 : 954-9.