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Original Article

A Prospective Study on Drug Utilization Pattern of NSAIDs in Patients Attending Orthopaedics OPD of a Tertiary Care Hospital

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ABSTRACT

Background: *The objective of this study was to analyse the prescribing pattern of NSAIDs in patients attending Orthopaedics OPD and to analyse the correlation between the use of selective COX-2 inhibitors and older conventional NSAIDs in the pattern of current practice.* ***Methods****: This Prospective study was conducted on Patients visiting Orthopaedics OPD of Pacific Medical College and Hospital, Udaipur, during 6 month study period. Individual data was collected in a preformed format and was analyzed on parameters such as demographic profile and NSAID's usage pattern.* ***Results:*** *180 patients were selected on the basis of inclusion and exclusion criteria. Around 417 drugs were prescribed, out of which 302 were oral, 39 were topical (Table No.2). Out of 417 drugs, total number of systemic NSAID's used were 302 [72.2%]. Of these 185 (56.2%) were used as monotherapy and 144 (43.7%) were used as fixed dose combinations (FDC). Among monotherapy 103 (55.68 %) were non-selective and 82 (44.32 %) were selective COX inhibitors.*

Conclusion*: The result of this study suggests that the frequent use of selective COX-2 inhibitors although conventional non-selective NSAIDs topped the list of various selective and non-selective NSAIDs. Concomitant gastro protectives were also used. Fixed dose combinations were also prescribed.*

Key words: *NSAIDs, GI toxicity, COX-1, COX-2, Orthopaedics.*

INTRODUCTION

Non-steroidal anti-inflammatory drugs (NSAIDs) are drugs having analgesic, antipyretic and anti-inflammatory effects1, which were most widely used class of drugs in the world and are used as over the counter drugs2. The mediators of pain, inflammation and fever are prostaglandins, in addition they also play a role in protecting gastric mucosa, platelet and renal function.

NSAIDs act by interfering with the production of these prostaglandins by inhibiting the enzyme cyclooxygenase [COX], resulting relieving in pain and inflammation-desired action, in addition to this protection in gastric mucosa, renal and platelets functioning-undesired actions.

COX is available in two types i.e. COX-1 and COX-2.[1,2] The COX-1 enzyme is involved in controlling physiological functions such as stomach mucus production and kidney water excretion as well as formation of platelet but COX-2, is involved in producing prostaglandins which are responsible for inflammation, pain and fever. Due to undesirable effects of NSAIDs i.e. gastrointestinal and renal toxicity, major clinical limitation. This undesirable effect is associated with the ability of NSAIDs to inhibit COX-1 in the GIT.

COX-2 inhibitors are thought to act by selectivity blocking COX-2, thereby reducing pain and inflammation, but not blocking COX-1. Standard NSAIDs are known to block both COX-1 and COX-2, reducing inflammation but at the same time blocking the protective role of COX-1, thus producing adverse effects, particularly on the gastric mucosa, hence the selective COX-2 inhibitors are potential NSAIDs without producing gastro toxicity and was sufficient to produce the desirable therapeutic effects by inhibition of selective COX-2.[3,4]

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These COX-2 inhibitors, look like solution to NSAIDs related GI problem. However, Post marketing experience unmarked various adverse cardiovascular effects. Recent 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.[5]

With variety of NSAIDs that are presently available, it is difficult at times to select a particular NSAID on a rational basis alone but on empiricism. These are increasingly used for variety of indications like rheumatoid arthritis (RA), osteoarthritis (OA), cervical spondylitis and lower backache (LBA) etc.

Therefore, a prospective study was planned and conducted in the Department of Pharmacology and in Orthopaedics OPD of a tertiary care teaching hospital, Pacific Medical College and Hospital, Udaipur to analyse the prescribing pattern of NSAIDs.

MATERIALS AND METHODS

This Prospective study was conducted on Patients visiting Orthopaedics OPD of Pacific Medical College and Hospital, Udaipur, during 6 month study period suffering from various diseases like arthritis, Cervical spondylitis, neck and lower back ache were included in the study . For better co-operation, patients were informed in brief regarding the benefits they could subsequently reap from the feedback study. In case of children and women, their parents, and spouses or close relatives respectively were taken into confidence for a better communication. Individual data was collected in a preformed format and was analyzed on parameters such as demographic profile and NSAID's usage pattern. Ij`

A total of 180 patients were included in the study and their prescriptions were analyzed. Most of the patients co-operated as the reasons for the study were explained politely before seeking their participation. The demographic profile has been described in Table 1.

Table 1: Demographic Characteristics

Patient Characteristics	Number	(%)
Age groups (years)		
18 - 30	58	32
31 - 49	66	37
50 - 69	40	22
69 - 70	16	9
Total	180	
S e x		
Male	102	57
Female	78	43
M : F Ratio	1.30:1	
Prescribing indicators		
Average Number of drugs per prescription	2.31	

RESULTS

In 180 patients, 417 drugs were prescribed, out of which 302 were oral, 39 were topical (Table No.2). Out of 417 drugs, total number of systemic NSAID's used were 302 [72.2%]. Of these 185 (56.2) were used as monotherapy and 144 (43.7%) were used as fixed dose combinations (FDC). Among monotherapy 103 (55.68 %) were non-selective and 82 (44.32 %) were selective COX inhibitors (Table 2).

Diclofenac sodium 72 (38.92%), ibuprofen 12 (6.49%) and piroxicam 19 (10.27) were commonly used from the conventional older NSAIDs but among new selective COX-2 inhibitors Valdecoxib 14 (8.95%) and Etoricoxib 68 (36.51%) were most commonly. The ratio of non-selective to selective NSAID drug prescription was 1.25:1.

Table-2 Pattern of NSAIDs used in Orthopaedics OPD

Total number of prescriptions	n=180	
Total number of drugs used	417	
Average number of drugs per prescription	2.31	
Total number of systemic NSAIDs	302	(72.2%);
	a) As Monotherapy- 185(56.2%); b) As F.D.C- 144 (43.7%)	
Topical NSAIDs	39 (11.9%)	
Total number of non-selective NSAIDs	103	55.68%
Total number of selective NSAIDs	82	44.32%
Total number of Gastro-protective	(PPI/ PPI + Antiemetic) 111 (62%) (Ranitidine 60 (33%)	

FDC of diclofenac sodium, paracetamol with chlorzoxazone (45.7%) was most commonly prescribed followed by combination of valdecoxib and tizanidine (34.3%). Most commonly prescribed NSAIDs were diclofenac sodium followed by Etoricoxib suggesting that GI safety may have been an important concern while prescribing these drugs. In 14.1% of prescriptions, gastro protective agents were used along with NSAID's and most commonly ranitidine was prescribed.

Table 3: Comparison of Selective and Non-Selective NSAIDs

Name of Drugs	Drug prescribed	
	Numbers	Percentage
Selective		
Valdecoxib	14	8.95
Etoricoxib	68	36.51
	82	
Non - Selective		
Diclofenac	72	38.92
Ibuprofen	12	6.49
Piroxicam	19	10.27
Total	103	

DISCUSSION

A Substantial use of selective COX-2 inhibitors was evident though conventional non-selective NSAIDs topped the list of various selective and non-selective NSAIDs in the present study. Concomitant gastro protectives were also used. Fixed dose combinations [FDC] were also prescribed, in the OPDs. COX-2 selective inhibitors were developed with assumption of better safety profile (renal and GI) than non-selective NSAIDs and became very popular few years back. However, the results of present study points towards the reversal of trends back to the use of conventional NSAIDs. This shift might have come with reported CVS toxicity with the use of selective COX-2 inhibitors. Recent reports from population based studies indicate increase risk of myocardial infarction and congestive cardiac failure in patients prescribe rofecoxib and celecoxib. Similarly,

thrombo-embolic phenomenon with parecoxib & Veldecoxib use has been reported after cardiac surgery.[5] On the other hand it is alarming that after awareness campaign about COX-2 selective inhibitors, there use continues. The possible reason appear to be confusion have been created with recent NSAIDs related controversies. Although the selective NSAIDs are costlier than the non-selective NSAIDs, the cost of therapy per prescription to the patient is lower as the selective NSAIDs need not be complimented with concomitant therapy with gasto-protective agents. In settings such as the one we have used, the Orthopaedic patients have to undergo relatively, a long-term therapy. Treatment with selective NSAIDs works out to be cost effective without any additional expense.

Initial trials showed superiority of COX-2 selective drugs over non-selective drugs but clinical experience has put their safety in question.[6] The withdrawal of rofecoxib and Valdecoxib by the manufacturing company, in lieu of causing cardiovascular side effects, has probably changed the prescribing pattern of NSAIDs.[7] The choice of COX-2 selective inhibitors for a particular patient should be based upon a number of factors including relative efficacy, toxicity, concomitant disease states, patients, age, renal function and cost.[8,9]

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