Prescription Pattern Analysis of Nonsteroidal Anti-Inflammatory Drugs in the Southeastern Karnataka Population, India

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Abstract

Objective: To analyze the prescription pattern of Non-Steroidal Anti-Inflammatory Drugs in Bangalore Baptist Hospital, Bellary Road, Hebbal, Bangalore. Methodology: The study method involves selection of patients based on the inclusion and exclusion Pregnant/lactating mothers were taken. The first step in the study was to design a Data collection form. The patient data collection form was used to collect all the details like Inpatients number, Patient name, Age, Sex, Date of admission, Date of discharge, Chief complaints (c/o), History of Present Illness (HOPI), Past Medication history, Laboratory data, Diagnosis and Therapeutic management. The second step in the study is prescription analysis (annexure1). It was used to study various parameters like Drug to Drug interaction, Adverse Drug Events (ADEs), Adverse Drug Reactions, Medication error and Therapeutic outcome. Result: From all the patients' data, 245 cases were screened based on the inclusion criteria using NSAIDs and categorized into male and female. 164 (66.93%) were observed to be male and 81 (33.06%) were female. Of all the NSAIDs prescribed, Paracetamol and Aceclofenac were observed to be14.69 % and 15.10 % respectively followed by Tramadol and Diclofenac. Among all the prescriptions, oral therapy found to be most used route of administration with 47.34 % followed by parenteral therapy with 31.02 % and then topical therapy with 21.63 %. Out of 245 patients, 94 patients (38.36%) were prescribed with H2 blockers along with NSAIDs, 86 patients (35.10%) with PPI and 65 patients (26.53%) with PPI and H2 blockers. Major drug interaction observed in the patients was Fluoroquinolones+ Ondansetron in 13 patients, followed by Dexamethasone +Tramadol in 26 patients, Paracetamol+COX2 in 17 patients. Most common risk factor is the age factor with 10.61 % followed with concomitant use of anti-coagulants with 7.75 % and patients with past history of peptic ulcer. Conclusion: A significant number of prescriptions were associated with irrational prescribing in both co-administrations of NSAIDs and GPAs and NSAIDs combination. A procedure must be created and executed for recommending and levelheaded utilization of drugs, e.g., proceeding with restorative instruction in regards to the potential dangers of NSAIDs, significance of their suitable and objective use, and need of fitting remedy composing in regards to both substance and sign.

Keywords: Nonsteroidal Anti- Inflammatory Drugs (NSAIDs), Prescription Pattern Analysis, Drug-Drug Interactions

INTRODUCTION

The treatment of pain and inflammation is a crucial area of therapeutics and arthritic and Non-arthritic disorders are commonly encountered in orthopedic practice. The utilization of NSAIDs is empirical. they supply only symptomatic relief without addressing underlying disease process. NSAIDs likewise happen to be most commonly recommended frequently abused independent from anyone else medicine^[1]. Various examinations both from created and creating nations have depicted the example of poly drug store including utilization of NSAIDs. That are pointless costly unreasonable, lacking sum or independent from anyone else meds. Intermittent Evaluations of medication use design empower reasonable alterations in NSAID recommending to stretch out the restorative advantage and to weaken the unfriendly impacts. Such examinations Monitor, assess and if essential, propose adjustments in endorsing practices of restorative actioners to frame the medicinal guide discerning and cost powerful.^[2]

NSAIDs are among the most commonly prescribed medications for inflammatory, arthritis and musculoskeletal conditions. Their use increases with age ^[3, 4]. However, the therapeutic effectiveness of NSAIDs is associated with

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How to cite this article: Bahreini, A., Koneri, R. Prescription Pattern Analysis of Nonsteroidal Anti- Inflammatory Drugs in the Southeastern Karnataka Population, India. Arch Pharma Pract 2020;11(S1):116-9. gastrointestinal complications, ranging from mild dyspepsia to life threatening ulcer complications such as perforation and hemorrhage ^[5]. In the elderly, an estimated 29% of fatal peptic ulcer complications may be due to NSAIDs ^[6]. So gastro protective agents like H2 blockers or proton pump inhibitors should be co-prescribed in patients using these NSAIDs for long time. Cyclooxygenase- 2 (COX-2) selective inhibitors have been demonstrated to reduce the risk of gastrointestinal mucosal injury and clinical consequences in patients with rheumatoid arthritis or osteoarthritis. These agents have the potential to produce prothrombotic effects and myocardial infarction compared with traditional NSAIDs.

These concerns have raised questions about the appropriateness of NSAID drug use in patients with differing degrees of gastrointestinal and cardiovascular risk ^[7] ADRs are considered as the 4th to 6th leading causes of death among hospitalized patients. These are associated with significant morbidity, mortality and permanent disability and are a huge economic burden on the patients due to prolonged hospitalization. It has been estimated that the incidence of ADRs throughout the world is 5% and 5-6% of all the hospital admissions which are caused by drug - induced problems ^[8]. The World Health Organization (WHO 2003) addressed drug utilization as the marketing, distribution, prescription and use of drugs in a society, considering its consequences medical, social or economic. Periodic evaluation of drug utilization patterns need 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 ^[9]

MATERIALS AND METHODS

The study was conducted in all the major departments of Bangalore Baptist Hospital, Bangalore, India, 500 bedded multi-specialty tertiary care teaching hospital. The study method involves selection of patients based on the inclusion and exclusion Pregnant/lactating mothers were taken.

The first step in the study was to design a Data collection form. The patient data collection form was used to collect all the details like Inpatients number, Patient name, Age, Sex, Date of admission, Date of discharge, Chief complaints (c/o), History of Present Illness (HOPI), Past Medication history, Laboratory data, Diagnosis and Therapeutic management.

The second step in the study is prescription analysis (annexure1). It was used to study various parameters like Drug to Drug interaction, Adverse Drug Events (ADEs), Adverse Drug Reactions, Medication error and Therapeutic outcome.

In this study the disease pattern reported by collecting the prescriptions of commonly occurred diseases in wards during our study period and identified as follows (i) only single NSAID was prescribed in the prescription (ii) Two drug combinations iii) Three drug combinations and iv) More than three drug combinations were assessed based on the results.

RESULT AND DISCUSION

From all the patients' data, 245 cases were screened based on the inclusion criteria using NSAIDs and categorized into male and female. 164 (66.93%) were observed to be male and 81 (33.06%) were female. Of all the NSAIDs prescribed, Paracetamol and Aceclofenac were observed to be14.69% and 15.10% respectively followed by Tramadol and Diclofenac. Table 1

Table 1: NSAIDs prescribed in the study population			
NSAID	No. of patients	Percentage of patients (%)	
Diclofenac	32	13.06	
Paracetamol	36	14.69	
Nimesulide	29	11.83	
Ibuprofen	23	9.38	
Celecoxib/Rofecoxib	32	13.06	
Naproxen	21	8.57	
Aceclofenac	37	15.1	
Tramadol	35	14.28	

Among all the prescriptions, oral therapy found to be most used route of administration with 47.34 % followed by parenteral therapy with 31.02 % and then topical therapy with 21.63 %. Table 2

Table 2: Comparison between Oral therapy v	s.			
Topical therapy vs. Parenteral therapy				

Therapy	No. of patients	% of patients
Oral therapy	116	47.34
Parenteral therapy	76	31.02
Topical therapy	53	21.63

Out of 245 patients, 94 patients (38.36%) were prescribed with H2 blockers along with NSAIDs, 86 patients (35.10%) with PPI and 65 patients (26.53%) with PPI and H2 blockers. Table 3

protective agents	prescribed	with Gastro
Gastro-protective agents	No. of patients	Percentage (%)
PPI (only)	86	35.10
H2 blockers (only)	94	38.36
PPI & H2 blockers	65	26.53

Major drug interaction observed in the patients was Fluoroquinolones+ Ondansetron in 13 patients, followed by Dexamethasone +Tramadol in 26 patients, Paracetamol+COX2 in 17 patients. Table 4

Table 4: Major Potential Drug-Drug Interactions observed			
DDI	Severity	No. of patients	% of patients
Dexamethasone+Trama dol	Moderate	26	10.61
Ondansetron+Tramadol	Moderate	11	4.48
Benzodiazepines+Opiods	Moderate	06	2.44

Flouroquinolones+Onda

nsetron Paracetomol+COX-2

Most common risk factor is the age factor with 10.61 % followed with concomitant use of anti-coagulants with 7.75 % and patients with past history of peptic ulcer. Table 5,6

Major

Moderate

13

17

5.30

6.93

Table 5: GI risk factors in the study population			
Risk factor	No. of patients	Percentage of patients (%)	
Age factor (> 60 yrs.)	26	10.61	
History of dyspepsia	16	6.53	
Concomitant use of Aspirin	15	6.12	
High dose of NSAIDs	14	5.71	
Concomitant use of anticoagulants	19	7.75	
History of peptic ulcer	17	6.93	
Concomitant use of corticosteroids	06	2.44	

ADR	No. of patients	% of patients	
Vomiting	05	2.04	
Constipation	07	2.85	
Reduced appetite	14	5.71	
Dizziness	08	3.26	
Rash	02	0.81	

148 of 245 patients were observed with good compliance and 97 patients with poor compliance Table 7

Table 7: Patients Adherence in the study population			
Patients Adherence	Male No. of patients (%)	Female No. of patients (%)	Total no. of patients (%)
< 80% (poor compliance)	48	49	97 (39.59)
> 80% (good compliance)	73	75	148 (60.40)

We assume that the frequency of NSAIDs prescriptions in our study has been underestimated because it was not possible to access the data of uninsured prescriptions, prescriptions belonging to other insurance companies, and OTC NSAIDs. A particular problem is that the most prominent members of NSAIDs, including ibuprofen, diclofenac, mefenamic acid, and naproxen are available as OTC medications in India. Unfortunately, simultaneous prescription of two or more NSAIDs has also been frequently reported. However, despite the established efficacy of NSAIDs, their uncontrolled and irrational use significantly decreases their safety and also is a leading cause of drug- related morbidity. Concurrent usage of two or more systematic NSAIDs has no pharmacological rationalization; this may be associated with an excessive risk of adverse events such as hepatic injury, acute renal failure, and gastrointestinal hemorrhage. This may emerge as a crucial public health problem with the increasing use of OTC nonsteroidal anti-- inflammatory agents. NSAIDs combinations should clearly be avoided. Physicians should inform patients about risks related to the use of NSAIDs combinations. Traditional NSAIDs such as aspirin (1), diclofenac ibuprofen (2),and (3) that exhibit nonselective COX inhibition represent some of the most widely prescribed NSAIDs. In confirmation to our results, diclofenac has been reported as the most widely prescribed NSAIDs to relieve short- term fever, pain, and inflammation. Furthermore, diclofenac 100 mg suppositories, ibuprofen syrup, and ibuprofen 400 mg tablets were the most prescribed drugs.

Following reasons might explain this:

- 1. Relatively low price of the whole dosage forms of diclofenac.
- 2. The rectal suppository could provide faster onset of relief and lower gastric irritation in patients with gastric sensitivity to NSAIDs.

The WHO analgesic ladder is easy tool for righteous selection of analgesic according to the intensity of pain. The pain assessment numerical score is a standard tool used in many advanced countries for analgesic selection. However, these guidelines were not followed, as per our observations. Patients employed in our study showed mean pain score in the range of 6-7 (data not shown), which is considered as moderate to severe pain, yet it did not affect the prescribers choice in selecting analgesic. For instance, Morphine and Fentanyl were scarcely used. Moreover, the choice of dosage form was also not rigorously managed, such as, morphine and many other potent analgesics were administered only intravenously, even though these drugs are available in oral dosage forms. Aceclofenac and Paracetamol were common analgesics prescribed, while other analgesics were seldom prescribed. Similarly, the of adjuvant analgesic were rare, although dexamethasone was present but it was indicated for other purpose rather than as adjuvant analgesic. We also encountered several pDDIs frequently found in patients prescribed with numerous drug combinations, and 60% of these pDDIs were of moderate severity. Analgesic combination with other drugs were identifies as major cause

of pDDIs. Similar results are also reported by Riechelmann et al., and van Leevun et al., where almost 34 % noted pDDIs were of major severity .^[10, 11] One of the poor pain management in Pakistani hospital may be the lack of pharmacist involvement in health care team. Pain management is a collaborative team work, in which pharmacist work with physicians to determine optimal analgesic regimen according to the needs of patient. It is pharmacist's understanding and knowledge of drugs-drug interactions, drug pharmacokinetics and mechanism of action that can help to individualize analgesic regimen so that complete analgesia can be achieved with minimal adverse drug reaction. The commonest indications for attending the orthopedics OPD were low back ache and spondylosis. In our study the commonest indications for which an NSAID was prescribed were the above two conditions. In a study in eastern Nepal, the commonest indication for prescribing an NSAID was fractures.9 NSAIDs were the most commonly prescribed category of drugs with diclofenac and meloxicam being the most commonly prescribed individual drugs. In eastern Nepal, diclofenac, ibuprofen and piroxicam were most commonly prescribed. A single NSAID was prescribed in 126 instances while 2 NSAIDs were prescribed together in 42 patients. Our results are comparable to that reported previously. The choice of drugs, the duration and the route chosen were appropriate in the majority of cases. The appropriateness was determined by the authors after consulting different sources in the drug information center and the college library. An anomaly observed was the absence of a written indication in the prescription about whether the NSAID is to be taken before or after food. Though it was not a part of the methodology of the present study we had previously observed that the instruction is verbally given by the doctor and reemphasized by the pharmacist but considering the high risk of gastrointestinal adverse effects of NSAIDs it would be more prudent to mention this on the prescription also.^[11]

CONCLUSION

The frequency of NSAIDs prescription was relatively high in Southeastern Karnataka population. A significant number of prescriptions were associated with irrational prescribing in both co-administration of NSAIDs and GPAs and NSAIDs combination. A strategy must be developed and implemented for prescribing and rational use of medications, e.g., continuing medical education regarding the potential risks of NSAIDs, importance of their appropriate and rational use, and necessity of appropriate prescription writing regarding both content and indication.

Improving patient knowledge on correct dosage will boost up the present healthcare in the hospital setting. Educational interventions emphasizing rational prescribing and a strict NSAIDs prescribing policy can help significantly to overcome these problems and to reduce the extent of resistance to NSAIDs. The results and discussion presented in this study provide a baseline data which will be useful for any NSAIDs drug utilization study.

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