

Original Article

PRESCRIPTION PATTERN ANALYSIS OF ANTI-INFLAMMATORY DRUGS IN GENERAL MEDICINE AND SURGERY DEPARTMENT AT A TERTIARY CARE HOSPITAL

S. JAYAKUMARI, A. GOKUL KRISHNA

Department of Pharmacognosy, School of Pharmaceutical Science, Vels University, Chennai 600117
Email: nisajayaa@gmail.com

Received: 02 Feb 2016 Revised and Accepted: 17 May 2016

ABSTRACT

Objective: The objective of this research was to evaluate and analyze the prescription pattern of anti-inflammatory drugs given in the general medicine and surgery department at a tertiary care hospital.

Methods: The entire study was planned to be carried out for a period of six months. Total 84 patients were included in this study and was carried out in a 300 bedded tertiary care hospital. The patients admitted to the general medicine and surgery department were included in this study, of which patients given with anti-inflammatory drugs were recorded and analyzed for prescribing practice and rational use.

Results: The majority of the patients were admitted to general medicine ward rather than surgery ward, and the non-steroidal anti-inflammatory drugs (NSAIDs) were highly prescribed to the age group of 41-60 y. And about 88.89 % of non-NSAID injection, 11.11% of NSAID injection were prescribed. The prescribed drugs were mostly given by generic names (81.52 %) and least by brand name (18.48 %).

Conclusion: This results obtained in this research work will be helpful to increase awareness of the limitations and difficulties on the translation of these recommendations into clinical practice, but also to stimulate the creation of strategies or tools to increase the appropriate therapy.

Keywords: Prescription pattern, NSAIDs, Tertiary care hospital, Non-steroidal anti-inflammatory drugs, Rational use of drugs

© 2016 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)

INTRODUCTION

Nonsteroidal anti-inflammatory drugs are among the most commonly used medication worldwide, and their safety needs to be scrutinized. There is also uncertainty regarding the safety of cyclooxygenase-2 (COX-2) non-selective NSAIDs [1]. NSAIDs are widely used to treat inflammatory conditions and pain, by inhibiting cyclooxygenase-1 (COX-1) mediated production of prostaglandins is observed. An alternative is selective COX 2 inhibitors, available in the form of older or newer agents. The newer COX 2 inhibitors, introduced into clinical practice in 1998, were developed as NSAIDs with an improved gastrointestinal side effect profile. The cardiovascular safety of all marketed newer COX 2 inhibitors requires thorough evaluation in view of the increased cardiovascular and renal risk reported for several of these drugs [2]. All NSAIDs are also associated with other side effects, including hypertension, water retention, heart failure and renal insufficiency. Guidelines recommend the use of nsNSAIDs plus a gastro protectant or a COX-2-selective NSAID alone in patients with one or more gastrointestinal (GI) risk factors [3]. A study analyzing general complication profiles in surgical patients who have received early postoperative NSAIDs is lacking. This study aimed to determine the safety profile of postoperative NSAIDs after major gastrointestinal resection in current United Kingdom practice [4]. The common cold is the most common and widespread illness known to humans. NSAIDs for example, aspirin, ibuprofen, and naproxen, have analgesic (pain reducing), antipyretic (fever reducing) and, in higher doses, anti-inflammatory effects. NSAIDs have been widely used for over a century for the treatment of pain and fever associated with the common cold and so it important to assess the efficacy of using NSAIDs for treating pain or fever associated with the common cold. There is some evidence that cold symptoms might be the result of inflammatory mediators such as kinins and prostaglandins, which can be blocked by NSAIDs, rather than the result of the direct cytopathic effects of viruses [5].

NSAIDs make up one of the largest groups of pharmaceutical agents used worldwide. In the past, NSAIDs are used by 20% or more of the population. NSAIDs are also one of the most common causes of adverse drug reaction reported to drug regulatory agencies as well

as in many clinical and epidemiological studies [6]. NSAIDs represent a most widely prescribed class of medications and are used as over the counter drugs. NSAIDs work by interfering with the cyclooxygenase (COX) pathway, which involves the conversion of arachidonic acid by the enzyme COX to prostaglandins. COX is available in two isoforms, i.e., COX-1 and 2. Despite the wide clinical use of classical NSAIDs as analgesics, antipyretic, 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. 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. At first glance, these COX-2 inhibitors looked like a solution to NSAIDs-related GI complication.

However, Post-marketing experience unmarked various adverse cardiovascular effects. Recent evidence of adverse cardiovascular events with the use of COX-2 selective inhibitors has created a sense of insecurity not only among prescribers but also among consumers [7].

New developments in medical research and practice pertinent to each guideline will be reviewed at an established time and indicated at the publication to assure continued validity. NSAIDs are valuable agents in the treatment of arthritis and other musculoskeletal disorders, and as analgesics in a wide variety of clinical scenarios. Unfortunately, their use has been limited by their association with mucosal injury to the upper gastrointestinal tract, including the development of peptic ulcer disease and its complications, most notably upper gastrointestinal hemorrhage, and perforation [8]. NSAIDs are the most commonly used drugs for managing surgical pain and inflammation. The role of steroids as adjunctive measures to reduce postoperative inflammation, swelling, and pain has also received importance in recent years. Although the role of NSAIDs and steroids has been very beneficial in terms of pain relief, these drugs also have an associated risk of side effects and adverse drug reactions [9]. Inhibit the activity of both cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2), and thereby, the synthesis of prostaglandins and thromboxanes. It is thought that inhibiting COX-2 leads to the anti-inflammatory, analgesic and antipyretic effects

and that those NSAIDs also inhibiting COX-1, particularly aspirin, may cause gastrointestinal bleeding and ulcers. For this reason, the advantages of COX-2 selective inhibitors may be indicated.

MATERIALS AND METHODS

Study site

The study entitled "prescription pattern analysis of anti-inflammatory drugs in general medicine and surgery department at a tertiary care hospital" was carried out in a 300 bedded tertiary care hospital employee state insurance corporation (ESIC) located at Ayanavaram, Chennai.

Before commencement of the project, all necessary permissions were attained from the hospital organization for conducting the study.

Study design

A patient information form has been prepared to inform the patient or the caretakers about the purpose and necessity of the study. The patient information form assures that the confidentiality will be strictly maintained, and also the study will help the betterment of patient health. The form includes the details of department address, name, and signature of the investigator and supervisor, date, place and details of the study.

A separate data entry form for incorporating patient details was also designed. The format contains the details such as name, age, height, weight, in-patient/out-patient number IP/OP number, date of admission (D. O. A), date of discharge (D. O. D), reason for admission, Patient past medical and medication history, family and personal history, vital signs, blood counts, blood sugar, diagnosis, drug chart that should contain NSAIDs.

Data collection

Inclusion Criteria-Patients getting admitted to the general medicine and surgery department of both genders. Prescription of all patients

admitted to the selected department of the tertiary care hospital. Prescription with anti-inflammatory drugs are the primary targets; age is not a concern.

Exclusion criteria-Pregnant patients, patients who were not willing to participate, patients terminally ill were excluded from the study.

Data analysis

During data collection patients were informed about the study using patient information format. A regular ward round into the study department was carried out. The medical charts of the patients were screened for appropriateness in all possible ways. Patient demographics like age, weight, date of admission, the length of stay, medical histories including drug allergies were entered into the specially designed data entry form.

The obtained data were analyzed and was categorized based on the type of cause and its treatment. Patient medical history has also been categorized.

RESULTS AND DISCUSSION

Age groups Vs NSAIDs prevalence

In the study which was conducted among 84 patients, the age group between 41-60 y were found to be given more number of NSAIDs (46.42 %) to 39 patients than others like 61-80 y (25 %) 21 patients, 21-40 y (14.3 %) 12 patients, 1-20 y (13.09 %) 11 patients and the least number of NSAIDs were given to the age group more than 81 y (1.19 %) which was 1 patient. So the NSAIDs are most likely prescribed to geriatric patients and less in pediatric and adolescent age groups.

Gender distribution

Among the total number of patients (84) surveyed for this study, male patients were found to be (46.43 %) 39 in number and female (53.57 %) patients were 45 in number.

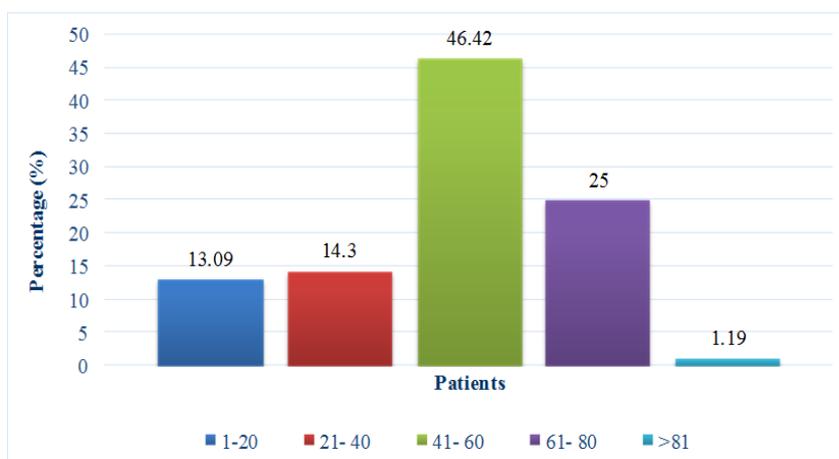


Fig. 1: Age groups Vs NSAIDs prevalence

Table 1: Gender distribution in the study population

Gender	Percentage (%)	Number (N= 84)
Male	46.43	39
Female	53.57	45
Total	100	84

Ward distribution

Among 84 patients, we observed that majority of the patients were admitted to the general medicine ward (82.14 %) 69 in number, rather than in surgery ward (17.86 %) 15 in number.

Guidelines compliance of the study population

Guidelines compliance for this study was revealed to be (90.47 %) 76 in number and the prescribed NSAIDs Non-compliance was found to be (9.53 %) 8 in number.

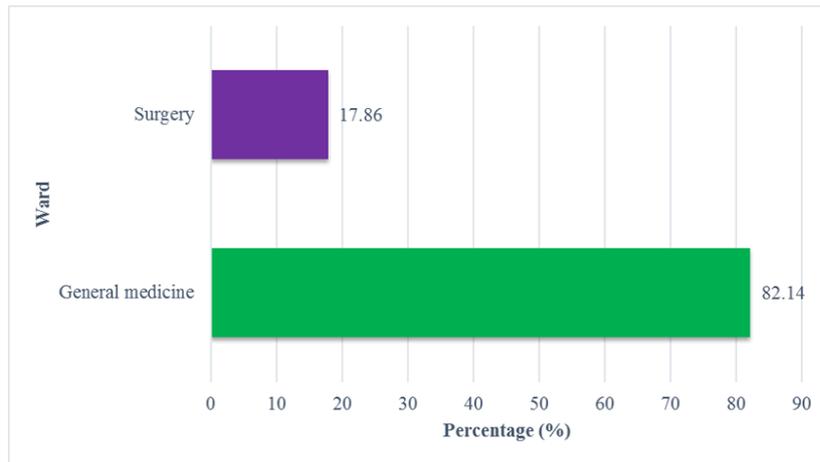


Fig. 2: Ward distribution



Fig. 3: Guidelines compliance

Average number of drugs vs NSAIDs of the study population

The average number of drugs given to a single patient according to the information collected from the study sample size was found to be (85.94 %) 11.36 drugs per patient approximately. And the average number of NSAIDs prescribed from the study sample size was found to be (14.06 %) 1.86 drugs per patient approximately.

NSAID injections prescribed In this study

Among the study sample size, the total number of injection prescribed was found to be 207, In that 184 injections were Non-NSAIDs injections (88.89 %). The number of NSAIDs prescribed in the injection (11.11 %) was 23 in number.

Frequency of prescribing NSAIDs in the study

The frequency of prescribing NSAIDs was grouped into three different sets, the single NSAIDs (22.66 %) was to found to be 29 prescribed drugs, the double NSAIDs (51.56 %) was found to be 66 prescribed drugs, the multiple NSAIDs (25.78 %) was found to be 33 prescribed drugs.

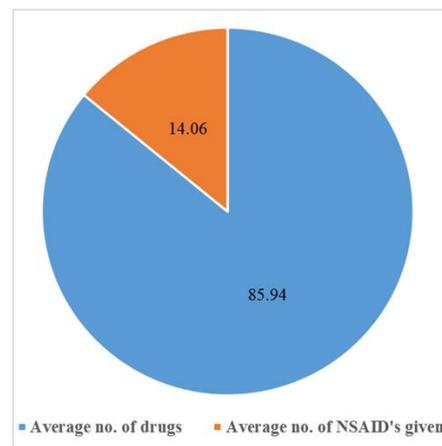


Fig. 4: Average number of drugs vs NSAIDs

Table 2: NSAID injections prescribed

Parameters	Number of IV injections	Percentage (%)
Total number of injections prescribed	184	88.89
Number of NSAID injections prescribed	23	11.11

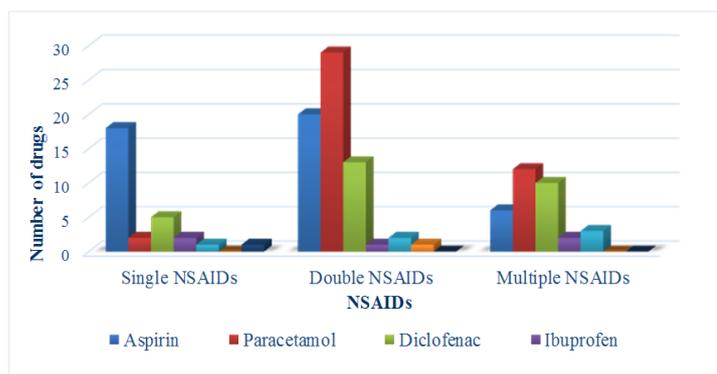


Fig. 5: Frequency of prescribing NSAIDs

Distribution of individual NSAIDs in this study population

The distribution of individual NSAIDs was found to be in percentage vs. NSAIDs, where the drug *Aspirin* (34.37 %) was given for 44 number of patients as a peak value, *Paracetamol*

(33.52 %) 43 number of patients being the second largest. *Diclofenac* (21.91 %) 28 number of patients-third largest. *Ibuprofen* (3.9 %) 5 number of patients. *Indomethacin* (4.7 %) 6 number of patients. *Ketoprofen* (0.8 %) 1 number of patient. *Ketorolac* (0.8 %) 1 number of patient.

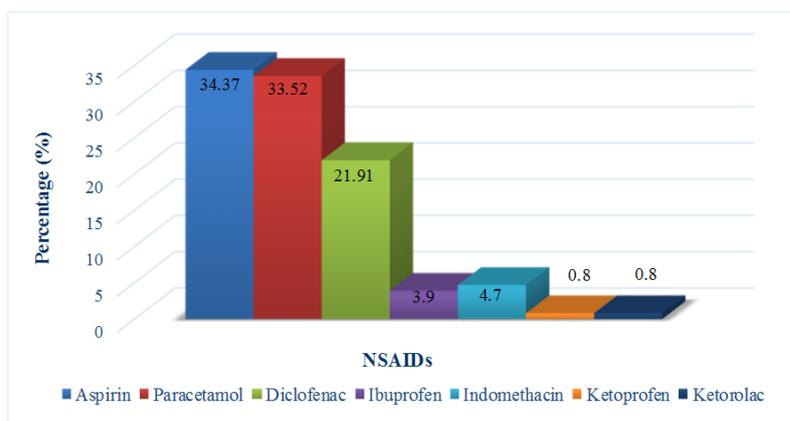


Fig. 6: Distribution of individual NSAIDs

Table 3: Method of prescribing pattern

Prescribing pattern	Percentage (%)	Number of drugs (N = 157)
NSAIDs given in Brand name	81.52	128
NSAIDs given in Generic name	18.48	29
Total	100	157

Method of prescribing pattern in the study population

The methods of prescribing pattern that was prescribed in brand name (81.52 %) were of 128 numbers of drugs and the drugs prescribed in the generic name (18.48 %) were off 29 number of drugs.

This study describes the prescription pattern of anti-inflammatory drugs given in the general medicine and surgery department which were observed to be rational and was in accordance with the guidelines. These findings is similar to the prescribing frequency reported by Somia Gul and Maria Ayub from the journal of scientific and innovative research 2014, 200 prescriptions were analyzed containing chiefly NSAIDs mainly from the ICU department of the hospital (80%) and remaining (only 40) prescriptions were collected from general physicians out of 200 prescriptions. The prescribing pattern of the physician was assessed and incurred to be irrational prescribing of the NSAIDs. About 69% (138/200) prescriptions containing double NSAIDs were analyzed and mostly with a combination ratio with acetaminophen observed. Percentage of single NSAIDs (25%) was very low compared with double NSAIDs but greater than prescription containing multiple NSAIDs (06%), the current study also states the same. The study was done by Nada A

Yasein *et al.* 2011 [14] is coinciding with the frequency distribution of individual NSAIDs, and prescribing frequency according to age group and gender with the current study.

CONCLUSION

After careful consideration of the study, we can highlight following interventions, in the above study which was conducted in 84 patients, We observed that majority of the patients were admitted to general medicine ward than surgery ward, and the NSAIDs were highly prescribed to the age group of 41-60 y. Almost 90.47 % of patients complied with guidelines and the other 9.53 % of patients was not in compliance with guidelines. About 88.89 % of non-NSAID injection, 11.11% of NSAID injections were prescribed. More than one NSAIDs were given for most of the patients (Double NSAIDs 51.56 %), single NSAIDs was prescribed the least-22.66 %.

The Prescribed drugs were mostly given by brand names-81.52 % and least by generic name-18.48 %. We conclude that according to the study most of the prescribed drugs are in accordance with international guidelines and was seen rational among prescribing.

CONFLICTS OF INTERESTS

All authors have none to declare.

REFERENCES

- Chia-Hsuin Chang, Wen-Yi Shau, Chuei-Wen Kuo, Shu-Ting Chen, Mei-Shu Lai. Increased risk of stroke associated with nonsteroidal anti-inflammatory drugs. *Ahajournals* 2010;41:1884-90.
- Morten Schmidt, Christian F Christiansen, Frank Mehnert, Kenneth J Rothman, Henrik Toft Sørensen. Non-steroidal anti-inflammatory drug use and risk of atrial fibrillation or flutter: population based case-control study. *Br Med J* 2011;343:3450.
- Angel Lanás, Guillermo García-Tell, Beatriz Armada, Angel Oteo-Alvaro. Prescription patterns and appropriateness of NSAID therapy according to gastrointestinal risk and cardiovascular history in patients with diagnoses of osteoarthritis. *BMC Med* 2011;9:38.
- S J Chapman, J Glasbey, M Kelly, C Khatri, D Nepogodiev, J E F Fitzgerald, *et al.* Impact of postoperative nonsteroidal anti-inflammatory drugs on adverse events after gastrointestinal surgery. *Wiley Online Library* 2014;101:1413-23.
- Soo Young Kim, Yoon-Jung Chang, Hye Min Cho, Ye-Won Hwang, Yoo Sun Moon. Non-steroidal anti-inflammatory drugs for the common cold. *Cochrane Database Systematic Rev* 2013;6:1-73.
- M Gupta, S Malhotra, S Jain, An Aggarwal, P Pandhi. The pattern of prescription of non-steroidal anti-inflammatory drugs in orthopedic outpatient's clinic of a north Indian tertiary care hospital. *Indian J Pharmacol* 2005;37:404-5.
- Vikas Dhikav, Sindhu Singh, Swati Pande, Atul Chawla, Kuljeet Singh Anand. Non-steroidal drug-induced gastrointestinal toxicity: mechanisms and management. *J Indian Academy Clin Med* 2003;4 Suppl 4:315-22.
- Sung-Hun Lee, Chang-Dong Han, Ick-Hwan Yang, Chul-Won Ha. Prescription pattern of NSAIDs and the prevalence of NSAID-induced gastrointestinal risk factors of orthopedic patients in clinical practice in Korea. *J Korean Med Sci* 2011;26:561-7.
- VS Manohar, M Vinay, T Jayasree, PV Kishan, S Ubedulla, Rohit Dixit. Prescribing pattern of gastroprotective agents with non-steroidal anti-inflammatory drugs. *J Pharmacol Pharmacother* 2013;4:59-60.
- Frank L Lanza, Francis KL Chan, Eamonn MM Quigley. Guidelines for prevention of NSAID-related ulcer complications. *Am J Gastroenterol* 2009;104:728-38.
- Rahul Datta, Yasmin Grewal, Jaspreet Singh Bath, Amandeep Singh. A survey of analgesic and anti-inflammatory drug prescription for oral implant surgery. *Plast Aesthet Res J* 2015; 2:51-5.
- Barry Schlansky, Joo Ha Hwang. Prevention of nonsteroidal anti-inflammatory drug-induced gastropathy. *J Gastroenterol* 2009;44 Suppl 19:44-52.
- Somia Gul, Maria Ayub. Prevalence of prescribing pattern of more than one NSAID in Pakistan. *J Sci Innovative Res* 2014;3 Suppl 2:148-54.
- Nada A Yasein, Farihan Barghouti, Fatin T Al Faris, Lana N Hatamleh, Mohammed S Farah, Yacoub M Irshaid. Prescription pattern of nonsteroidal anti-inflammatory drugs in a family practice clinic at Jordan university hospital. *J Med J* 2011;45 Suppl 1:9-17.
- Taruna Sharma, S Dutta, DC Dhasmana. Prescribing pattern of NSAIDs in orthopedic OPD of a tertiary care teaching hospital in Uttaranchal. *JK Sci* 2006;8:160-2.
- TC Hayas Mohammed, I Mufida Beegum, P Perumal. Prescribing pattern of analgesics in a tertiary care hospital. *Int J PharmTech Res* 2011;3 Suppl 3:1521-9.
- Mohammed A Al-Homrany, Yacoub M Irshaid. Pharmacoepidemiological study of the prescription pattern of analgesics, antipyretics, and nonsteroidal anti-inflammatory drugs at a tertiary health care center. *Saudi Med J* 2007;28 Suppl 3:369-74.